MYT Petition for approval of Truing up for Aggregate Revenue Requirement (ARR) for FY 2022-23 & FY 2023-24, Provisional Truing up for FY 2024-25, and MYT for Fifth Control Period from FY 2025-26 to FY 2029-30

Annexures

Brihanmumbai Electric Supply & Transport Undertaking

(of the Brihanmumbai Mahanagarpalika)

Volume IV of IV

January 2025

https://drive.google.com/drive/folders/1VT7Q_qiKN4olSBMzlykKmfxLejtLvLbe?usp=sharing

Index

M. M. MATHURIA & ASSOCIATES.

CHARTERED ACCOUNTANTS
56, Botawala Building, 1st Floor, Office No: 9 & 10, Bomanji Master Lane, Mumbai- 400 002.
Website: http://www.mathuria.in, E-mail: incometax@mathuria.in

Date: 29th December,2023

To,
CAO & FA
The Brihan Mumbai Electric Supply & Transport Undertaking
BEST Bhavan, Best Marg,
Mumbai -400 001

Dear Sir,

1. This Certificate is issued in accordance with the terms of Appointment letter CAO & FA/Dy. CAO (RC)/128/2023 dated 28.06.2023 issued by BEST undertaking for certifying Restated Data of its Electricity Business & Data under MERC's (Uniform Recording and Reporting of Information) Regulation — 2009 for the F.Y. 2022-23 of Electricity Business & for certifying Restated Data of the BEST undertaking of Electricity Business for the F.Y. 2022-23 for the purpose of Revamped Distribution Sector Scheme (RDSS) of Government of India.

2. MERC has directed BEST undertaking vide their order dated 9th March,2006 to maintain the Proforma Accounts and Financial Statements for its Electricity Business separately from F.Y. 2006-07 onwards in the prescribed Formats as applicable to entities under the Companies Act, 2013 (Erstwhile Companies Act, 1956).

Responsibility of Management for Financial Statements

3. The Preparation of the Proforma Accounts is the Responsibility of the Management of BEST undertaking including the preparation and maintenance of all accounts, adequate accounting records and other relevant supporting documents. The Management of BEST undertaking is also responsible for applying appropriate basis for preparation and making estimates that are responsible and prudent.

4. The undertaking has ensured that it provides all relevant information pursuant to Companies Act. 2013.

Responsibility of Certifying Chartered Accountants Firm

5. We have examined the restated data of the Supply Division/ (Electricity Business) of the BEST undertaking for the year ended 31st March,2023 .The Financial Statements are prepared by the undertaking pursuant to the Mumbai Municipal Corporation Act,1888.

Emphasis of matter:

I. The figures of financial statements of Electric supply division are derived by management by allocating the items of consolidated financial statements into 3 divisions namely; Supply, Bus and General Administrative division. Further, the items of General Administrative division are divided into Electricity supply and Bus division in proportion of staff deployed by respective departments.

II. As informed by the management, depreciation on fixed Assets wherever applicable is based on the rules and the manner prescribed under Regulation of MERC (terms and conditions of Tariff) regulations 2019. The depreciation is provided on Straight Line Method. Depreciation rates and life of an asset are specified by MERC regulations.

III. It was observed that, no depreciation is charged on fixed assets purchased during the year as required by the MERC regulations. Also, for assets sold during the year, the depreciation for the entire year is provided irrespective of date of sale. This practice is consistently followed by the organization during the past several years.

IV. Gratuity paid to employees who have retired during the period under audit has been correctly provided in the accounts. However, no provision is made for gratuity in respect of employees who are still in employment.

V. Similarly, leave encashment paid during the period to employees has been duly accounted for. However, the provision is not made for the employees who have not yet opted for leave encashment

VI. The details of consumption of inventory are not shown under the statement of Profit & Loss as required by Schedule III of companies Act, 2013. It was observed that purchases are directly charged to revenue account.

VII. The asset side of the balance sheet includes Rs.1,66,32,000/-re1ated to "Fixed and call with Chetana Co-op Bank" in other current assets. However, as informed by the management, the said bank is in liquidation and the matter is pending in court of law.

CERTIFICATION:-

On the basis of examination of the books, records and statements produced before us and to the best of our knowledge and according to the information, explanations and representations given to us, subject to our observation above, we certify that the aforesaid restated data for Supply Division (Electricity Business) has been prepared in accordance with the generally accepted principles and the format prescribed under the Companies Act, 2013.

Our examination of these restated financial statements was conducted in accordance with the standards on Auditing and other applicable authoritative pronouncements issued by the Institute of Chartered Accountantsof India. Our examination was not planned or performed

MUMBAI
M.No.
49425

in connection with any transactions to identify matters that may be of potential interest to third parties.

We conducted our examination of the statements in accordance with Guidance note on Reports or Certificate for special Purpose (Revised 2016) issued by the Institute of Chartered Accountants of India. The Guidance Note requires that we comply with ethical requirement of the code of Ethics issued by the Institute of Chartered Accountants of India.

We have complied with the relevant applicable requirement of the Standard on Quality control (SOC)1, Quality Control Firms that performs Audits and Reviews of Historical Financial information , and other Assurance and related Services Engagements.

Restriction on use

This report is issued solely for the purpose of MERC and RDSS Scheme of Government of India as mentioned in paragraph 1&2 above and should not be used by any other person or for any other purpose. Accordingly, we do not accept or assume any liability or any duty of care for any other purpose or to any other person to whom this report is shown or into whose hands it may come without our prior consent in writing. This report relates only to the items specified above and does not extend to any financial statements of the BEST undertaking taken asa Whole.

For M. M. Mathuria & Associates,
Chartered Accountants
FRNo. 115354W

MATHURIA & ASSOCIATES MUMBAI M. No. 49425 CHARTERED ACCOUNTANTS

Mr. Manoj Mathuria
(Proprietor)
M. No. 049425
Place: Mumbai

UDIN: 23049425BGUCJC6879

Brihan Mumbai Electric Supply & Transport Undertaking
Balance Sheet of Electric Supply as at 31st MARCH 2023
UDIN : 23049425BGUCJC6879

EQUITY AND LIABILITIES	Notes	As at 31st MARCH 2023 (in lakhs)	As at 31st March 2022 (in lakhs)
Shareholders' funds			
Reserves and surplus	2	4,66,672.25	5,68,257.53
		4,66,672.25	**5,68,257.53**
Non-current liabilities			
Long- Term Borrowings	3	2,14,890.57	1,75,065.96
Other non-current liabilities	4	53,171.66	44,779.52
		2,68,062.23	**2,19,845.48**
Current liabilities			
Trade payables	5	6,514.23	5,725.04
Other current liabilities	6	2,81,542.80	2,00,192.42
		2,88,057.03	**2,05,917.46**
TOTAL		**10,22,791.50**	**9,94,020.47**
ASSETS			
Non-current assets			
Fixed assets			
Tangible assets	7	1,60,901.27	1,55,885.11
Capital work-in-progress		4,174.89	3,642.03
Non-current investments	8	7,570.01	6,330.01
Long-term loans and advances	9	6,063.26	6,024.47
Other non-current assets	10	1,325.83	1,298.83
		1,80,035.25	**1,73,180.46**
Current assets			
Inventories	11	1,230.19	799.60
Trade receivables	12	42,259.34	53,151.25
Cash and Bank Balances	13	2,93,340.39	3,83,328.22
Short-term loans and advances	14	5,03,981.28	3,81,640.93
Other current assets	15	1,945.04	1,920.01
		8,42,756.24	**8,20,840.01**
TOTAL		**10,22,791.50**	**9,94,020.47**
Significant accounting policies	1		

As per our report of even date

For M.M MATHURIA & ASSOCIATES
Chartered Accountants
Registration No.:115354W

CA Manoj. M. Mathuria
Proprietor
M.No. 049425
Place: Mumbai
Date: 29th December, 2023

For Brihan Mumbai Electric Supply & Transport Undertaking

for
Mr. Vijay Singhal
General Manager

Brihan Mumbai Electric Supply & Transport Undertaking
Statement of Profit and Loss for the year ended 31st March 2023
UDIN : 23049425BGUCJC6879

	Notes	For the year ended 31st MARCH 2023 (in lakhs)	For the year ended 31st MARCH 2022 (in lakhs)
Income			
Revenue from operation (gross)	16	3,60,797.03	3,04,904.06
Less: Excise duty			
Revenue from operation (net)		**3,60,797.03**	**3,04,904.06**
Other income	17	8,179.23	7,124.76
Total Revenue		**3,68,976.26**	**3,12,028.82**
Expenses			
Purchase of electricity		3,77,499.49	2,80,350.84
Emloyee benefit expense	18	59,532.90	55,978.26
Finance cost	19	11,922.75	8,539.66
Depreciation	7	10,928.82	10,757.63
Other expenses	20	18,075.91	17,315.89
Total expenses		**4,77,959.86**	**3,72,942.27**
Profit before tax and Exceptional items		**(1,08,983.60)**	**(60,913.45)**
Exceptional items		-	-
Profit before tax		**(1,08,983.60)**	**(60,913.45)**
Significant accounting policies	1		

As per our report of even date

For M.M MATHURIA & ASSOCIATES
Chartered Accountants
Registration No.:115354W

CA Manoj. M. Mathuria
Proprietor
M.No. 049425
Place: Mumbai
Date: 29th December, 2023

For Brihan Mumbai Electric Supply & Transport Undertaking

for 29/12/23
Mr. Vijay Singhal
General Manager

Brihan Mumbai Electric Supply & Transport Undertaking

Cash flow statement (Supply Division) for the year ended 31st March, 2023

UDIN : 23049425BGUCJC6879

PARTICULARS	For the year ended 31st March, 2023	For the year ended 31st March, 2022		For the year ended 31st March, 2020	For the year ended 31st March, 2019
SURPLUS BEFORE TAX	(108983.60)	(60913.45)		29,342.72	-
Adjusted for :					
Depreciation	10,928.82	10,757.63		10,327.30	8,780.25
Profit on sale of Fixed Asset	983.94	971.29		(245.36)	(1,041.18)
Unclaimed balances/ excess provision written back					
Finance cost	11,922.75	8,539.66		8,780.25	44,158.01
Interest income	(55.40)	(75.82)		(54.83)	-
loss on sale of investments					
Movement in reserve and prior period items	7398.32	25868.90		13,966.24	-
Profit on sale of investment (including exceptional item)					
Provision for doubtful debts					
Advances/ balances written back	(2,337.29)	(757.50)		(2,000.06)	(1.63)
OPERATING SURPLUS BEFORE WORKING CAPITAL CHANGES	(80142.47)	(15609.30)		60,116.27	51,895.45
AND OTHER ADJUSTMENTS					
Adjustments for :					
(Increase)/ Decrease Trade Receivables	10891.91	(11,420.06)		(5,775.04)	1,349.27
(Increase) / Decrease Loans and advances	(122379.13)	(57,419.30)		5,364.68	(31,499.67)
Increase / (Decrease) Trade Payables	789.19	(285.94)		(950.19)	-
Increase / (Decrease) Other liabilities and provisions	89742.51	16,484.98		8,616.21	(5,123.32)
(Increase) / Decrease Other Assets	(52.03)	(40.50)		(125.45)	-
(Increase) / Decrease Inventories	(430.59)	(145.91)		1,349.27	-
Cash generated from operations	(1,01,580.61)	(68,436.03)		68,595.75	16,621.73
Direct Taxes (paid) / refund (net)					
(a) NET CASH FLOW FROM / (USED IN) OPERATION ACTIVITES	(1,01,580.61)	(68,436.03)		68,595.75	16,621.73
cash flow from investing activities:					
(Purchase) / Sale of fixed assets (including capital work in progress)	(15124.47)	(13,806.33)		(24,160.44)	(13,075.27)
Withdrawal / (investment) of margin deposits					
(Purchase) / Sale of Investments	(1240.00)	(674.00)		(620.00)	37.96
Interest received	55.40	41.77		19.37	-
Dividend received					
(b)NET CASH FROM /(USED) IN INVESTING ACTIVITIES	(16,309.07)	(14,438.56)		(24,761.08)	(13,037.31)
Cash flow from financing activities:					
Long term bank loan taken / (Repaid)	39,824.61	1,36,718.19		(4,174.76)	-
Short term bank loan taken / (Repaid)					
Unsecured Loans from related parties taken					
Unsecured Loans from related parties repaid					
Finance cost paid	(11922.75)	(8,539.66)		(8,780.25)	-
(c)NET CASH FROM/ (USED) IN FINANCING ACTIVITIES	27901.87	128178.53		(12,955.01)	-
Net increase / (decrease) in cash and cash equivalents (a+b+c)	(89987.81)	45303.94		30879.67	3584.42

PARTICULARS	For the year ended 31st March, 2023	For the year ended 31st March, 2022		For the year ended 31st March, 2020	For the year ended 31st March, 2019
Cash and cash equivalents as at the commencement of the year, comprising :					
Cash	1711.14	4,188.49		3,546.03	-
Cheques on hand					
Balances with scheduled banks on current accounts	381617.07	3,33,835.79		2,53,104.69	-
	383328.21	3,38,024.28		2,56,650.72	-
Cash and cash equivalents as at the end of the year, comprising :					
Cash	(10604.18)	1,711.14		4,191.67	2,83,338.72
Cheques on hand					
Balances with scheduled banks on current accounts	303944.57	3,81,617.07		2,83,338.72	-
	293340.39	3,83,328.22		2,87,530.38	2,83,338.72
NET INCREASE /(DECREASE) AS DISCLOSED ABOVE	(89,987.82)	45303.94		30,879.67	2,83,338.72

As per our report of even date

For M.M MATHURIA & ASSOCIATES
Chartered Accountants
Registration No.:115354W

CA Manoj. M. Mathuria
Proprietor
M.No. 049425
Place: Mumbai
Date: 29th December, 2023

For Brihan Mumbai Electric Supply & Transport Undertaking

for
29/12/23
Mr. Vijay Singhal
General Manager

Notes forming part of Accounts
For the year ended 31st March, 2023
(Supply)

The B.E.S. & T Undertaking is required to maintain books of account as provided in section 460MM of The Mumbai Municipal Corporation Act, 1888 as amended. Since the B.E.S.& T Undertaking does not have any share capital and being a part of the local authority, Maharashtra Electricity Regulatory Commission(MERC), has permitted it to maintain the books of account in the manner provided in the Mumbai Municipal Corporation Act, 1888. This is in addition to preparation of performa accounts in the format prescribed under the Companies Act, 1956 as amended 2013.

As provided in section 126A of the Mumbai Municipal Corporation Act, 1888 it is mandatory for the Undertaking to prepare budget estimates of income and expenditure of the next ensuing year. After the grant of approval by the B.E.S.T Committee and the Municipal Corporation these estimates are treated as grants.Keeping in view the above statutory position the following accounting policies are followed by the Undertaking: -

1) **Revenue Receipts Allocation:**

a) **General administration receipts: -**

i) These receipts include interest on deposits and other investments. These are allocated in the ratio of 90:10 to Electric Supply and Transport Divisions.

ii) Apprentice premium and other receipts are allocated in the ratio of 50:50 to Electric Supply and Transport Divisions.

iii) Rent of Land and Buildings is allocated in the ratio of 25:75 to Electric Supply and Transport Divisions.

iv) Income arising on sale of assets of General Administration Department is allocated in the ratio of 27:73 to Electric Supply and Transport Divisions.

v) Other Receipts and Advertisement receipts are allocated in the ratio of 50:50.

2) **Gratuity:**

Provision is made in the accounts for gratuity payment due to the employees. The Liability on accrual basis is Rs. 105.57crores.

3) **Advertisement Receipts: -**

The advertisement receipts are accounted in the ratio of 50:50.

4) **Encashment of Leave:**

Provision is made in the accounts for LTA / leave encashment dues of the employees.

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5) **Allocation of General Administration Expenses:**

The allocation of General Administration Expenses between the Electric Supply and Transport Division is mainly on the basis of number of employees deployed in each division and the percentage of allocation during the current financial year and the immediately preceding year were as under:

Sr No.	Particulars	2022-23		2021- 22	
		Supply (%)	Transport (%)	Supply (%)	Transport (%)
1)	Security and Vigilance	25	75	15	85
2)	Civil Engineering Department	45	55	45	55
3)	Time Keeping, Personnel, Welfare, Medical etc.	19	81	20	80
4)	EDP Department	65	35	51	49
5)	Legal, Audit, Accounts, Cash, Secretarial, PRO etc.	50	50	50	50

6) **Allocation of Energy Charges for the purpose of considering the operational efficiency of the two divisions**.

The energy utilised in the various Bus Depots is charged as expenditure to the Transport Division and corresponding notional income is included in the income of Electric Supply division.

7) **Depreciation Provision:**

i) The Depreciation on the Fixed Assets is provided under the Straight-Line Method.

ii) The estimated life of assets in the Electric Supply Division is based on the MERC's regulations, 2019.

iii) The Depreciation so computed is restricted to 90% of the book value of assets.

iv) The Depreciation has been provided on the Opening balance of the assetsas on 1st April, 2022.

v) Items of Furniture and other Office Equipments, tools individually costing lessthan Rs. 10,000/- are charged to revenue in the year of purchase.

vi) The rates of Depreciation applied for various classes of assets& policy for calculation of Depreciation is as per the MERC Regulations, 2019.

8) **BEST Staff Benefit Fund (Statutory Fund under Section 460 HH):**

As required under the M.M.C. Act, the said fund is created and source of this fund is fines collected from the Officers / Staff under Section 460 (W) on account of misconduct, etc. In addition to this, Donations from passengers, Income out of sale of lost property are also credited to this fund. The application of this fund is to give financial assistance to the widows of the staff in case of death while in service and also for well being of staff members. This is a dedicated fund and not invested in the bankand included in otherReserve.

9) **Motor Vehicles(Third Party Insurance Fund) a Statutory Fund:-**

As required under the Motor Vehicle Act a statutory fund uptoRs. 20 Lakhs is required to be created to settle the claims arising out of accidents. This being a dedicated fund is required to be invested separately. The amount to be charged to Revenue depends upon the number of vehicles used by the Electric Supply, Transport and General Administration divisions of the Undertaking and included in other Reserve.

10) **Fidelity Insurance Fund (Non-Statutory): -**

Every year a provision is made towards Fidelity Insurance Fund to safeguard interest of the Undertaking against the risk arising out of cash handling by employees. Provision towards Fidelity Insurance Fund was stopped due to no debit was charged for last 8 years. No such incidence is reported in last 8 years.

11) **Property Insurance Fund (Non-Statutory): -**

The Property Insurance Fund is created by providing Minimum 0.5% and Maximum 5% of the opening value of the total Assets of the Undertaking (Excluding Land). In view of creating this fund no general insurance policy is contracted with any outside insurance company to cover the assets against any risk. Under this fund, a similar treatment is given as stated in the General Reserve Fund in order to equalize the provision towards the Property Insurance Fund to the extent of 0.5% on the Opening Gross Fixed Assets at the time of bifurcating the Balance sheet of Supply &Transport.In Case No.33 of 2016 Maharashtra Electricity Regulatory Commission(MERC) has disallowed the amount of Property Insurance Fund for Second MYT Control Period for FY 2012-13 to FY 2015-16 and have directed to take Property Insurance from an outside Agency, the corresponding Insurance Premium will be allowed as expenses. However, the BEST Undertaking could not take the policy in the F.Y.2022-23. Hence the provision of Property Insurance Fund is not considered by the Undertaking.

12) **Electric Supply Contingency Reserve Fund (Statutory Fund): -**

Every year 0.5% on the opening value of the total assets of the Electric Supply Division and 50% of the opening value of the General Administration assets (excluding land) is charged to revenue to create the above statutory fund. From FY 2011-12, it is decided to charge 0.25% on the Opening value of the asset on Electric Supply Division and 50% on the Opening value of General Administration Assets as per the MERC's & APTEL Order.

13) **Generation of Electricity Fund(Non- Statutory Fund):-**

The provision to this fund is made after keeping cash balance of Rs.50000, (for Electric supply Division) as per Section 460 KK (1) in the BEST Undertaking. The provision to this fund is made from the Surplus. The investment against this fund was already utilized for the earlier wage settlement for the period from FY 2001-02 to FY 2005-06.

14) **Consumer Contribution & Government Grant:**

Consumer Contribution, Capital Connection fees& Government Grant received till March, 2023 was brought under the Schedule 1 as both these funds are contributing for the Gross Block Assets of the Supply Division.

15) **Obsolescence of Stores (Non-Statutory Fund): -**

The said fund is created with the approval of BEST Committee & Corporation and source of this fund is based on quantum of Obsolescence of Stores value and same is first charged to Revenue Account. The application of this fund is to write off the book value of obsolete and unserviceable stores items. During the year entire amount lying in the fund is utilized.

16) **BEST Group Insurance Fund (Non-Statutory Fund)**

The said fund is created with the approval of BEST Committee & Corporation in the year 2014-15. The said fund is utilized to make the payment of Financial aid to the legal heirs of deceased members/ employees/officers along with payment under "The B.E.S. & T. Undertaking's Group Insurance Scheme".

17) **Fixed Assets:-**

i) The Fixed Assets are stated at Cost of Acquisition and net of Government Grants received from State&Central Government and consumers capital connection fees.

ii) The assets of General Administration Department which are made available to both the divisions are apportioned on 50:50 basis.

iii) Capital Work in – Progress includes Capital Stock in hand.

iv) Assets retired from active use and awaiting disposal have not been itemized.

18) **Inventory:-**

i) Stock of stores and consumables comprised of spares are valued at cost.

ii) Scrap declared but not disposed off is valued at expected average realizable sale rate.

iii) Purchases are charged to revenue account and stock taken at the year end.

19) **Investment: -**

Long term investments are stated at cost. Provision is generally made for diminution in realizablevalue other than temporary in nature.

20) **Bank Balances: -**

There were no separate designated bank accounts for Electric Supply Division till the Financial Year 2007-08. Since the Financial Year 2008-09 the bank accounts are designated. However, funds are utilized for Transport Division as& when required andvice-versa.

21) **Statutory Contribution to M.M.C. Fund:**

Due to deficitduring the year, the statutory contribution to the Municipal Fund as required under section 460KK(2)(e) amounting to Rs.40 lakhs have not paid and not reflected under Trade Payables.

22) **Fixed & Call with Chetana Co-operative Bank**

The Undertaking has invested an amount of Rs. 167.32 lakhs with Chetana Co-operative Bank Ltd. in the F.Y. 1989-90. Out of this, an amount of Rs.1.00 lakh was received on 20.11.1995 from the liquidator of the Bank. The said Bank is in liquidation and the matter is pending in the Court of Law.

23) **Generation of Electricity Fund Investment: -**

The BEST Undertaking has invested certain Provident Fund amount in Bonds issued by Madhya Pradesh Electricity Board and Uttar Pradesh Co-op. Spinning Mills from FY 1994-95 to 1998-99.

These Bonds issuing Companies had defaulted in payment of interest as and when it was due. Hence the Undertaking had filed suits in various Court of Law against both these companies. In turn, the Madhya Pradesh Electricity Board has made the payment of principal amount invested by the Undertaking and have not made the payment of interest thereon. As such, suit for recovery of interest thereon against this Company is pending in the Court of Law.

As regard to amount invested in UPCSMFL Bonds 2003, UPCSMFL Bonds 2004, the Company has neither made payment of principal amount nor interest thereon hence the Undertaking had filed suit for recovery of principal amount and interest against this Company and these suits are pending for final hearing.

24) Contingent Liability: -

Term Deposit with Chetana Co-operative Bank -	Rs.	166.32 lakhs
Generation of Electricity Fund Investment -	Rs.	200 lakhs

25) Related Party Disclosures:-

As per the Accounting Standard (AS-18) on related party disclosure issued by The Institute of Chartered Accountants of India, the disclosure of transaction with related party as defined in the Accounting Standard is as follows: -

i) **List of Related Parties and Relationships**

Name of Related Parties	Relationship
Mumbai Municipal Corporation	BEST Undertaking is a Statutory Committee of the Mumbai Municipal Corporation.
BEST Committee	Competent Authority
Mr. Lokesh Chandra, IAS	General Manager

The General Manager manages the affairs of BEST Undertaking, under the supervision and control of BEST committee and Mumbai Municipal Corporation.

ii) **Transaction / Balance with MMC:-**

Particulars/Natures	Type	Amounts in`. in Lakhs
Sale of Energy (Street Lighting)	Income	780.44 (786.77)
Repairs of Street Lighting	Income	6360.723 (4963.46)
Permanent reinstatement of Cable Trenches	Expenditure	1034.92 (1867.24)

Note: Figures in brackets are of Previous Year.

26) Spark Green Energy vendor – Penalty on Interest free deposit is applicable due to delay, which is not provided in the current financial statements.

27) Previous year's figures have been regrouped/restated/reclassified where necessary.

28) Provision for Bad Debts are made for 1.5% of closing balance of Sundry Debtors.

As per our attached report of even date

For M. M. Mathuria & Associates,
Chartered Accountants
FRN. 115354W

Mr. Manoj Mathuria
(Proprietor)
M. No. 049425
Place: Mumbai
Dated: 29th December,2023
UDIN : 23049425BGUCJC6879

For Brihan Mumbai Electric Supply&Transport Undertaking

29/12/23

for **Mr. Vijay Singhal**
General Manager

Notes forming part of financial statement

	As at 31st MARCH 2023 (in lakhs)	As at 31st March 2022 (in lakhs)
2 RESERVES AND SURPLUS		
STATUTORY RESERVE (As per BMC Act, 1888)		
A. Sinking Fund for Public Loan	-	-
Addition during the year	-	-
	-	-
Less: Deduction During the Year		
	-	-
B. *Best Staff Benefit Fund	296.65	270.43
Addition during the year	36.46	26.22
	333.11	296.65
Less: Adj/Deduction During the Year	-	-
	333.11	**296.65**
C. Motor Vehicles(Third Party Ins Reserve)		
Addition/ Adj during the year		
Less: Adj/Deduction During the Year		
Total of A+B+C	**333.11**	**296.65**
NON-STATUTORY RESERVE		
D. Property Insurance Reserve	10,014.73	10,014.73
Addition during the year	-	-
	10,014.73	10,014.73
Less:Adj/ Deduction During the Year	-	-
	10,014.73	**10,014.73**
E. Third Party Insurance Reserve		
Addition during the year		
Less: Deduction During the Year		
F. Depreciation Fund	-	-
Addition during the year	-	-
Less: Deduction during the year		
	-	-
G. Fidelity Insurance Reserve	7.03	7.03
Addition/Adj during the year	-	-
	7.03	7.03
Less: Adj/Deduction During the Year	-	-
	7.03	**7.03**

Notes forming part of financial statement

	As at 31st MARCH 2023 (in lakhs)	As at 31st March 2022 (in lakhs)
H. Grant/Consumer Cont.	36,631.00	35,803.01
Addition/ Adj during the year	3,954.12	827.99
	40,585.12	36,631.00
Less: Deduction / Adjustments During the Year		
	40,585.12	**36,631.00**
I. BEST Group Ins. Fund	(11.91)	(11.92)
Addition during the year	0.00	0.01
	(11.91)	(11.91)
Less: Deduction/Adj During the Year		
	(11.91)	**(11.91)**
J. Electric Supply Contingencies Reserve	6,897.10	6,161.57
Addition/Adj during the year	761.55	735.52
	7,658.64	6,897.10
Less: Deduction During the Year	-	-
	7,658.64	6,897.10
less: Invested amount as per regulation & investable amount	-	-
	7,658.64	**6,897.10**
K. * Generation Of Electricity Fund	19,687.30	19,655.30
Addition/Adj during the year	-	32.00
	19,687.30	19,687.30
Less: Deduction During the Year		
	19,687.30	**19,687.30**
Total of D+E+F+G+H+I+K	**77,940.92**	**73,225.25**
J. *Minimum Cash Balance as per Section 460KK1	0.50	0.50
Addition/Adj during the year		
	0.50	0.50
Less: Deduction During the Year		
	0.50	**0.50**
K. B. E. S. T. Staff Amenities Reserve	0.30	-
Provided during the year	-	0.30
	0.30	-
Less: Deduction During the Year	-	-
	0.30	**0.30**
L. Obsolescence of stores	10.53	6.53
Addition/Adj during the year		
	10.53	6.53
Less: Deduction / Adjustments During the Year	-	-
	10.53	**6.53**
M. Surplus		
Opening balances as per last financials	4,94,728.30	5,31,398.90
Add: Profit/(Loss) for the year	(1,08,983.60)	(60,913.45)
Add: Prior period items	3,403.74	24,978.37
	3,89,148.44	**4,95,463.82**
Deduct : Transfer to Contingency reserve fund	(761.55)	(735.52)
	3,88,386.89	**4,94,728.30**
Total of J+ K+L+M	**3,88,398.22**	**4,94,735.63**
Total	**4,66,672.25**	**5,68,257.53**

Notes forming part of financial statement

	As at 31st MARCH 2023 (in lakhs)
3 Long-term borrowings	
Secured loan	
Secured against first charge on plant & machinery from Canara Bank^	
Long Term finance *	-
Unsecured loan	
APDRP Loan**	453.95
Short Term Finance *	32,333.33
REC #	23,719.06
DEPOSIT WITH BEST FUND (FROM SBF)	
Short Term Finance (Tata Finance)	1,58,384.22
	2,14,890.57

^ Rate of Interest 12.95% and secured against first charge on plant & machinery

** The maturity period of the loan will be 20 years and repayments being made in 20 installments.
The loan carries interest @ 10.50%.

* The repayment to be made in 6 monthly installments. The loan carries interest @ 10.00%

\# Rate of Interest 11.75%

	As at 31st MARCH 2023 (in lakhs)
4 Other Non-Current Liabilities	
Security Deposit	
- Deposit from Employees	35.87
- Deposit from Customer	53,135.79
	53,171.66

	As at 31st MARCH 2023 (in lakhs)
5 Trade payables	
Trade payables *	6,514.23
	6,514.23

* The Company has not received information from Creditors regarding their status under the Micro, disclosure relating to amounts unpaid as on 31st March 2018 together with Interest paid / payable have not been ascertained.

	As at 31st MARCH 2023 (in lakhs)
6 Other current liabilities	
Statutory Liabiliities (Contributions to PF,Pension, ESIC, withholding Taxes,VAT etc.)	1,77,907.97
Empolyee dues payable	35,956.04
Current maturities for long term borrowings	
Other payables	67,678.79
	2,81,542.80

As at 31st MARCH 2023 (in lakhs)

8	**Non-current investments**	
	Unquoted Bond	
	General Securities :	324.00
	8.20% Oil Bond 2023	350.00
	8.83%IRFC Bond 2034	110.00
	9.97%APPFCL Bond 2024	230.00
	9.97%APPFCL Bond 2024	**1,014.00**
	BEST Group Insurance Scheme Fund	
	Central Bank of India Fort Branch	
	Indian Bank Fort Branch	
	Bank of India Electric House	
	Punjab National Bank Colaba	-
	Central Bank of India Pedder Road Branch	-
	Canara Bank Colaba	-
	Syndicate Bank,Fort	-
	State Bank of Patiala	-
	Generation of Electricity Fund Investment	200.00
	Unquoted Shares	0.01
	Shares in Saraswat Co-op Bank	6,356.00
	Contingencies Reserve Fund Investment	**6,356.01**
	Total	**7,570.01**

		As at 31st MARCH 2023 (in lakhs)
9	**Long term Loans and advances**	
	(Unsecured, Considered good)	
	Deposits	6,063.26
		6,063.26

		As at 31st MARCH 2023 (in lakhs)
10	**Other Non - Current Assets (Considered good)**	
	Deferred Revenue Expenditure	688.50
	Staff Benefit Fund Investment (Fixed Deposit)	166.32
	Fixed Deposit with Chetna Co - operative Bank	471.01
	Term Deposit with Canara Bank for LC	**1,325.83**

		As at 31st MARCH 2023 (in lakhs)
11	**Inventories**	1,230.19
	Inventories	
		1,230.19

		As at 31st MARCH 2023 (in lakhs)

12 **Trade receivables**

Unsecured, considered good stated otherwise

Debts outstanding for a period exceeding six months from the date they are due for payment	27,512.58
	27,512.58
Other receivables	14,746.76
	14,746.76
Total	**42,259.34**

	As at 31st MARCH 2023 (in lakhs)
13 Cash and bank balances	
Cash and cash equivalents	
Balance with banks in Current accounts	3,03,944.57
Cash on hand	(10,604.18)
	2,93,340.39
Balance in banks for margin money	
Staff Benefit Fund Investment (Fixed Deposit)	688.50
Fixed Deposit with Chetna Co - operative Bank	166.32
Term Deposit with Canara Bank for LC	471.01
CLTD A/C (FAME) WITH BANK OF INDIA	
	1,325.83
Less: Shown under other non current assets	(1,325.83)
	2,93,340.39

	As at 31st MARCH 2023 (in lakhs)
14 Short term Loans and advances	
(Unsecured, Considered good)	
Deposits	
Other loans and advances	
Loans to employees	67.04
Prepaid expenses	378.01
Advances recoverable in cash or kind	
- Others	2,937.14
- From Transport Division	5,01,333.12
- From suppliers	(734.03)
	5,03,981.28

	As at 31st MARCH 2023 (in lakhs)
15 Other current assets	
Interest Accrued but not received :	
Accrued Interest On contingencey reserve	162.21
Interest Accrued On Fixed And Call Deposit	116.67
Accrued Interest On Generation Of Electricty Fund	1,666.16
Accrued Interest On Staff Benefit Fund	-
Accrued Interest On BEST Group Insu. Fund	-
	1,945.04

	Year ended 31st March,2023 (in lakhs)	Year ended 31st March,2022 (in lakhs)
16 Revenue from operations		
Sale of service	3,60,190.39	3,04,767.74
Other operating income		
Sale of Scrap	606.64	136.32
Revenue from operations (Gross)	**3,60,797.03**	**3,04,904.06**
Sale of Service		
Distribution of energy by meter	3,52,954.28	2,99,017.54
Distribution of energy	875.39	786.77
Repairs & Maintenance of Street lighting	6,360.72	4,963.43
	3,60,190.39	**3,04,767.74**
17 **Interest income on**		
Bank deposits	55.40	75.82
Rent of Building & land	628.95	411.70
E. D collection & D P charges	3,915.87	4,900.38
Profit on Sale of Assets	983.94	971.29
Miscellaneous income	19.87	7.77
Discount, sundry balances written back	2,337.29	757.50
Advertisement receipts	237.90	0.30
	8,179.23	**7,124.76**

	Year ended 31st March,2023 (in lakhs)	Year ended 31st March,2022 (in lakhs)
18 Employee benefit expense		
Salaries, wages and bonus	44,107.09	42,981.23
Contribution to provident and	15,223.60	12,743.37
Staff welfare expense	202.21	253.66
	59,532.90	**55,978.26**
19 Finance cost		
Interest expense	11,095.60	6,974.69
Other borrowing cost	827.14	1,564.97
	11,922.75	**8,539.66**
20 Other expenses		
Power, Fuel and Electricity	503.55	548.14
Rent	1,311.76	1,299.02
Repairs and Maintenance		
Building	773.67	839.26
Machinery	358.09	215.41
Others	3,393.36	2,199.20
Insurance	-	0.00
Incentive charges	1,236.67	1,027.29
Advertisement Expenses	72.15	81.05
Network charges	1,677.15	1,668.66
Payment to Auditors (Refer details Below)	250.00	225.00
Printing and Stationery	182.70	183.36
Communication cost	707.69	796.10
Travelling and Conveyance	1,677.53	1,622.70
Legal and Professional Fees	405.91	347.75
Rates and taxes	207.90	72.42
Bad debts	565.00	459.00
Bank Charges	352.10	693.74
Discount on Electricity charges	2,260.17	1,520.26
Permanent Reinstatement	1,034.92	1,867.24
Other Establishment Expenses	923.17	1,242.63
Best staff amenities reserve expense	178.37	403.59
Property insurance fund	-	-
Provision for Obsolescence of stores	4.05	4.05
Transfer to MCGM u/s 460 KK(2)e		
	18,075.91	**17,315.89**

Payment to auditors		
As auditor		
Audit fee	250.00	225.00
Tax audit fee		
Limited review		
	250.00	**225.00**

APPENDIX NO. E-6

KED CAPITAL EXPENDITURE AS AT 31ST MARCH, 2023

PARTICULARS	TOTAL AS AT 31ST MAR,2022		ADDITIONS DURING FY 2022-23	DEDUCTION IN RESPECT OF ASSETS WRITTEN OFF	ADJUSTMENT IN RESPECT OF TRANSFER (+) OR (-)	TOTAL AS AT 31ST MARCH,2023	ACCUMULATED DEPRECIATION AS ON 31ST MARCH, 2023	NET VALUE AS ON 31ST MARCH, 2023
IERAL ADMINISTRATION								
D	41129692		0	0	0	41129692	0	41129692
LDINGS	766861935		400000	0	0	787261935	549610507	237651428
TOR VEHICLES	39295628		0	2837760	0	36457868	17735474	18722394
NT AND MACHINARY	38379262		0	0	0	38379262	29801033	8578229
RNITURE AND OFFICE EQUIPMENTS	63058527		377371185	10651218	0	429778494	31859952	397918542
OLS AND EQUIPMENTS	2980347		150000	0	0	3130347	1821734	1308613
CURITY EQUIPMENTS	3260388		0	0	0	3260388	2432064	828324
TOTAL	974965780		377921185	13488978	0	1339397987	633260764	706137223
ECTRIC SUPPLY								
ID	22953418		0	0	0	22953418	0	22953418
LDINGS	824262843		59729458	0	-6237000	877755301	430667163	447088138
NT & MACHINERY	12660786912	*	465264200	12864566	-302962	13112883584	7609785270	5503098314
BLES & MAINS / PILLARS/ST.LIGHTING	12384533986	*	811677522	9262163	-446475	13186502870	5457715492	7728787378
TERS AND INSTALLATIONS	1502474461	*	10273216	95613784	0	1517133893	928421502	588712391
REET LIGHTING LAMPS	1623029223	@	58807951	0	0	1681837174	560508606	1121328568
E. A. ON HIRE	419928		0	0	0	419928	344906	75022
TOR VEHICLES	138266692		0	15989559	0	122277133	101657197	20619936
OLS AND EQUIPMENTS	487828366		5716436	476110	2349024	495417716	206727063	288690653
RNITURE AND OFFICE EQUIPMENTS	273357486	+	14416453	5470321	0	282303618	266599466	15704152
TOTAL	30017913315		1425885236	139676503	-4637413	31299484635	15562426665	15737057970
SES								
ND	667872253		0	0	0	667872253	0	667872253
ILDINGS	1274254111		19692492	0	0	1293946603	670748041	623198562
SES / MOH OF BUSES	4656054103	$	0	315606414	589646	4341037335	2407576741	1933460594
TOR VEHICLES/MOH OF MOTOR VEH.	121083496		0	2371200	0	118712296	80318993	38393303
ANT AND MACHINERY	21360118		0	0	0	21360118	10072369	11287749
OLS AND EQUIPMENTS	104207707		101244	59438	0	104249513	72179449	32070064
RNITURE AND OFFICE EQUIPMENTS	491167652	&	56553232	1290087	0	546430797	184574525	361856272
TOTAL	7335999441		76346967	319327139	589646	7093608915	3425470118	3668138797
GRAND TOTAL	38328878536		1880153388	472492620	-4047767	39732491537	19621157547	20111333990

cudes 804 Nos of Buses (AC CNG 5Nos(2.75Cr) + Low Flooring CNG SD 549 Nos (127.19 Cr) + Midi CNG 250 Nos (49.97 Cr) under JNNURM amounting to Rs. 179.91 Crs.
cludes expenditure Incurred Under Accelerated Power Development Reform Programme Scheme of Central Government From Financial Year 2001-02 to 2008-09 amounting to Rs.291.66 Crs (Rs.143.21 Crores Under
ant & Machinery,Rs. 64.52 Crs Under Cable & Mains, Rs.75 02 Crs Under Meters & Rs. 8.91 Crs Under Office Equipments)
cludes Expenditure Incurred Under Business Process Automation Project (BPAP) Amounting to Rs.102.85 crs. (Rs.51.71 +0.10+00.39 +47.65+3.00Lakhs)
C of Rs."0 44 (crore)" was brought into Books of Accounts in FY 2022-23
cludes expenditure incurred towards procurement of 185 Nos of SD TATA buses (Lot 1/303) Rs. 90.56 Cr & Electric Hybrid buses (Lot 1/6) 6 Nos of buses Rs. 9.84Cr
ainst Rs. 100.00 Crs grant received from MCGM and Tejaswini SD buses (Lot 1 / 37) of Rs. 10.92 Crs
cludes expenditure incurred towards procurement of Furniture & Office equipments of 42.61 lakhs under Skill Development at Traffic Training Centre, Dindoshi against Grant of Rs. 50.00 Lakhs received fr. Central govt.
n received under RDSS project Rs 29 19 Crs From Central Govt and Advance paid to L&T (Rs.4.67 crs.) + TATA power (Rs.24.52 crs)
cludes Plant & Machinery of Rs. 108.72+0.11 Crs(21 22)+1.21 Crs (22 23) = 110.04 against 60% grant of Rs. 56.98 Crs received from Central Govt.for IPDS Project
cludes expenditure incurred towards Street Lighting Lamps (Rs. 16.39+47.84 Crs (FY19-20) for LED Street Light Lanterns / flood lights/bulbs & 12.62 +4.97 (FY 19-20)= 17.59 Crs for Led street lanterns of various watts)
Grant of (Rs. 7.38+18.57 FY 2019-20) Rs 25.95 Crs received from MCGM.
[illegible] Crs (21 22) + 30.10 Crs under I T M S project against Grant of Rs. 07.37 Crs received from MCGM.

UDIN:	23049425BGUCJC6879
MRN/Name:	049425/MANOJ MAHENDRA MATHURIA
Firm Registration No.:	115354W
Document type:	Certificates
Document sub type:	Others
Document Date:	29-12-2023
Create Date/Time:	29-12-2023 | 17:05:34
Financial Figures/Particulars:	
certifying Restated Data of its Electricity Business & Data under MERC's (Uniform Recording and Reporting of Information) Regulation — 2009:	0
certifying Restated Data of its Electricity Business & Data under MERC's (Uniform Recording and Reporting of Information) Regulation — 2009:	0
Document description:	certifying Restated Data of its Electricity Business & Data under MERC's (Uniform Recording and Reporting of Information) Regulation — 2009

M. M. MATHURIA & ASSOCIATES
MUMBAI
M. NO. 49425
CHARTERED ACCOUNTANTS

Mathuria

M. M. MATHURIA & ASSOCIATES.

CHARTERED ACCOUNTANTS

56, Botawala Building, 1st Floor, Office No: 9 & 10, Bomanji Master Lane, Mumbai- 400 002.
Website: http://www.mathuria.in, E-mail: incometax@mathuria.in

Date: 30th September, 2024

To,
CAO & FA
The Brihan Mumbai Electric Supply & Transport Undertaking
BEST Bhavan, Best Marg,
Mumbai -400 001

Dear Sir,

1. This Certificate is issued in accordance with the terms of Appointment letter CAO & FA/Dy. CAO (RC)/145/2023 dated 11.08.2023 issued by BEST undertaking for certifying Restated Data of its Electricity Business & Data under MERC's (Uniform Recording and Reporting of Information) Regulation — 2009 for the F.Y. 2023-24 of Electricity Business & for certifying Restated Data of the BEST undertaking of Electricity Business for the F.Y. 2023-24 for the purpose of Revamped Distribution Sector Scheme (RDSS) of Government of India.

2. MERC has directed BEST undertaking vide their order dated 9th March,2006 to maintain the Proforma Accounts and Financial Statements for its Electricity Business separately from F.Y. 2006-07 onwards in the prescribed Formats as applicable to entities under the Companies Act, 2013 (Erstwhile Companies Act, 1956).

Responsibility of Management for Financial Statements

3. The Preparation of the Proforma Accounts is the Responsibility of the Management of BEST undertaking including the preparation and maintenance of all accounts, adequate accounting records and other relevant supporting documents. The Management of BEST undertaking is also responsible for applying appropriate basis for preparation and making estimates that are responsible and prudent.

4. The undertaking has ensured that it provides all relevant information pursuant to Companies Act. 2013.

Responsibility of Certifying Chartered Accountants Firm

5. We have examined the restated data of the Supply Division/ (Electricity Business) of the BEST undertaking for the year ended 31st March,2024 .The Financial Statements are prepared by the undertaking pursuant to the Mumbai Municipal Corporation Act, 1888.

M.M. MATHURIA & ASSOCIATES
MUMBAI
M. No. 49425
CHARTERED ACCOUNTANTS

Emphasis of matter:

I. The figures of financial statements of Electric supply division are derived by management by allocating the items of consolidated financial statements into 3 divisions namely; Electricity Supply, Transport and General Administrative division. Further, the items of General Administrative division are divided into Electricity supply and Transport division in proportion of staff deployed by respective departments.

II. As informed by the management, depreciation on Fixed Assets wherever applicable is based on the rules and the manner prescribed under Regulation of MERC (terms and conditions of Tariff) regulations 2019. The depreciation is provided on Straight Line Method. Depreciation rates and life of an asset are specified by MERC regulations.

III. It was observed that, no depreciation is charged on fixed assets purchased during the year as required by the MERC regulations. Also, for assets sold during the year, the depreciation for the entire year is provided irrespective of date of sale. This practice is consistently followed by the organization during the past several years.

IV. Gratuity paid to employees who have retired during the period under audit has been correctly provided in the accounts. However, no provision is made for gratuity in respect of employees who are still in employment.

V. Similarly, leave encashment paid during the period to employees has been duly accounted for. However, the provision is not made for the employees who have not yet opted for leave encashment

VI. The details of consumption of inventory are not shown under the statement of Profit & Loss as required by Schedule III of companies Act, 2013. It was observed that purchases are directly charged to revenue account.

VII. The asset side of the balance sheet includes Rs. 1,66,32,000/- related to "Fixed and call with Chetana Co-op Bank" in other current assets. However, as informed by the management, the said bank is in liquidation and the matter is pending in court of law.

CERTIFICATION:-

On the basis of examination of the books, records and statements produced before us and to the best of our knowledge and according to the information, explanations and representations given to us, subject to our observation above, we certify that the aforesaid restated data for Supply Division (Electricity Business) has been prepared in accordance with the generally accepted principles and the format prescribed under the Companies Act, 2013.

Our examination of these restated financial statements was conducted in accordance with the standards on Auditing and other applicable authoritative pronouncements issued by the Institute of Chartered Accountants of India. Our examination was not planned or performed in connection with any transactions to identify matters that may be of potential interest to third parties.

M.M. MATHURIA & ASSOCIATES
MUMBAI
M. No.
49425
CHARTERED ACCOUNTANTS

We conducted our examination of the statements in accordance with Guidance note on Reports or Certificate for special Purpose (Revised 2016) issued by the Institute of Chartered Accountants of India. The Guidance Note requires that we comply with ethical requirement of the code of Ethics issued by the Institute of Chartered Accountants of India.

We have complied with the relevant applicable requirement of the Standard on Quality control (SOC)1, Quality Control Firms that performs Audits and Reviews of Historical Financial information , and other Assurance and related Services Engagements.

Restriction on use

This report is issued solely for the purpose of MERC and RDSS Scheme of Government of India as mentioned in paragraph 1 & 2 above and should not be used by any other person or for any other purpose. Accordingly, we do not accept or assume any liability or any duty of care for any other purpose or to any other person to whom this report is shown or into whose hands it may come without our prior consent in writing. This report relates only to the items specified above and does not extend to any financial statements of the BEST undertaking taken as a Whole.

For M. M. Mathuria & Associates,
Chartered Accountants
FRNo. 115354W

M. M. MATHURIA & ASSOCIATES
MUMBAI
M. No.
49425
CHARTERED ACCOUNTANTS

Mr. Manoj Mathuria
(Proprietor)
M. No. 049425
Place: Mumbai

UDIN: 24049425BKE7AY5206

Notes forming part of Accounts
For the year ended 31st March, 2024
(Electricity Supply division)

The B.E.S. & T Undertaking is required to maintain books of account as provided in section 460MM of The Mumbai Municipal Corporation Act, 1888 as amended. Since the B.E.S.& T Undertaking does not have any share capital and being a part of the local authority, Maharashtra Electricity Regulatory Commission(MERC), has permitted it to maintain the books of account in the manner provided in the Mumbai Municipal Corporation Act, 1888. This is in addition to preparation of proforma accounts in the format prescribed under the Companies Act, 1956 as amended 2013.

As provided in section 126A of the Mumbai Municipal Corporation Act, 1888 it is mandatory for the Undertaking to prepare budget estimates of income and expenditure of the next ensuing year. After the grant of approval by the B.E.S.T Committee and the Municipal Corporation these estimates are treated as grants.Keeping in view the above statutory position the following accounting policies are followed by the Undertaking: -

1) Revenue Receipts Allocation:

a) General administration receipts: -

i) These receipts include interest on deposits and other investments. These are allocated in the ratio of 90:10 to Electric Supply and Transport Divisions.

ii) Apprentice premium and other receipts are allocated in the ratio of 50:50 to Electric Supply and Transport Divisions.

iii) Rent of Land and Buildings is allocated in the ratio of 25:75 to Electric Supply and Transport Divisions.

iv) Income arising on sale of assets of General Administration Department is allocated in the ratio of 69:31 to Electric Supply and Transport Divisions.

v) Other Receipts and Advertisement receipts are allocated in the ratio of 50:50.

2) Gratuity:

No Provision is made in the accounts for gratuity payment due to the employees. Gratuity actually paid to employees is recorded as an expense in the books amounting to Rs. 99.27 crores.

3) Advertisement Receipts: -

During the year there are no advertisement receipts earned.

4) Encashment of Leave:

M. M. NATHURIA & ASSOCIATES MUMBAI CHARTERED ACCOUNTANTS

No Provision is made in the accounts for LTA / leave encashment dues of the employees. LTA / leave encashment actually paid to employees is recorded as an expense in the books amounting to Rs.5.90 crores.

5) Allocation of General Administration Expenses:

The allocation of General Administration Expenses between the Electric Supply and Transport Division is mainly on the basis of number of employees deployed in each division and the percentage of allocation during the current financial year and the immediately preceding year were as under:

Sr No.	Particulars	2023-24		2022-23	
		Supply (%)	Transport (%)	Supply (%)	Transport (%)
1)	Security and Vigilance	20	80	25	75
2)	Civil Engineering Department	45	55	45	55
3)	Time Keeping, Personnel, Welfare, Medical etc.	19	81	19	81
4)	EDP Department	65	35	65	35
5)	Legal, Audit, Accounts, Cash, Secretarial, PRO etc.	50	50	50	50

6) Allocation of Energy Charges for the purpose of considering the operational efficiency of the two divisions.

The energy utilised in the various Bus Depots is charged as expenditure to the Transport Division and corresponding notional income is included in the income of Electric Supply division.

7) Depreciation Provision:

i) The Depreciation on the Fixed Assets is provided under the Straight-Line Method.

ii) The estimated life of assets in the Electric Supply Division is based on the MERC's regulations, 2019.

iii) The Depreciation so computed is restricted to 90% of the book value of assets.

iv) The Depreciation has been provided on the Opening balance of the assetsas on 1st April, 2023.

v) Items of Furniture and other Office Equipments, tools individually costing lessthan Rs. 10,000/- are charged to revenue in the year of purchase.

vi) The rates of Depreciation applied for various classes of assets& policy for calculation of Depreciation is as per the MERC Regulations, 2019.

M. MATHURIA & ASSOCIATES MUMBAI CHARTERED ACCOUNTANTS

8) **BEST Staff Benefit Fund (Statutory Fund under Section 460 HH):**

As required under the M.M.C. Act, the said fund is created and source of this fund is fines collected from the Officers / Staff under Section 460 (W) on account of misconduct, etc. In addition to this, Donations from passengers, Income out of sale of lost property are also credited to this fund. The application of this fund is to give financial assistance to the widows of the staff in case of death while in service and also for well being of staff members. This is a dedicated fund and not invested in the bankand included in otherReserve.

9) **Motor Vehicles(Third Party Insurance Fund) a Statutory Fund:-**

As required under the Motor Vehicle Act a statutory fund uptoRs. 20 Lakhs is required to be created to settle the claims arising out of accidents. This being a dedicated fund is required to be invested separately. The amount to be charged to Revenue depends upon the number of vehicles used by the Electric Supply, Transport and General Administration divisions of the Undertaking and included in other Reserve.

10) **Fidelity Insurance Fund (Non-Statutory): -**

Every year a provision is made towards Fidelity Insurance Fund to safeguard interest of the Undertaking against the risk arising out of cash handling by employees. Provision towards Fidelity Insurance Fund was stopped due to no debit was charged for last 9 years. No such incidence is reported in last 9 years.

11) **Property Insurance Fund (Non-Statutory): -**

The Property Insurance Fund is created by providing Minimum 0.5% and Maximum 5% of the opening value of the total Assets of the Undertaking (Excluding Land). In view of creating this fund no general insurance policy is contracted with any outside insurance company to cover the assets against any risk. Under this fund, a similar treatment is given as stated in the General Reserve Fund in order to equalize the provision towards the Property Insurance Fund to the extent of 0.5% on the Opening Gross Fixed Assets at the time of bifurcating the Balance sheet of Supply &Transport.In Case No.33 of 2016 Maharashtra Electricity Regulatory Commission(MERC) has disallowed the amount of Property Insurance Fund for Second MYT Control Period for FY 2012-13 to FY 2015-16 and have directed to take Property Insurance from an outside Agency, the corresponding Insurance Premium will be allowed as expenses. However, the BEST Undertaking could not take the policy in the F.Y.2023-24. Hence the provision of Property Insurance Fund is not considered by the Undertaking.

M. M. MATHURIA & ASSOCIATES MUMBAI 49425 CHARTERED ACCOUNTANTS

12) **Electric Supply Contingency Reserve Fund (Statutory Fund): -**

Every year 0.5% on the opening value of the total assets of the Electric Supply Division and 50% of the opening value of the General Administration assets (excluding land) is charged to revenue to create the above statutory fund. From FY 2011-12, it is decided to charge 0.25% on the Opening value of the asset on Electric Supply Division and 50% on the Opening value of General Administration Assets as per the MERC's & APTEL Order.

13) **Generation of Electricity Fund(Non- Statutory Fund):-**

The provision to this fund is made after keeping cash balance of Rs.50000, (for Electric supply Division) as per Section 460 KK (1) in the BEST Undertaking. The provision to this fund is made from the Surplus. The investment against this fund was already utilized for the earlier wage settlement for the period from FY 2001-02 to FY 2005-06.

14) **Consumer Contribution & Government Grant:**

Consumer Contribution, Capital Connection fees& Government Grant received till March, 2024 was brought under the Schedule 1 as both these funds are contributing for the Gross Block Assets of the Supply Division.

15) **Obsolescence of Stores (Non-Statutory Fund): -**

The said fund is created with the approval of BEST Committee & Corporation and source of this fund is based on quantum of Obsolescence of Stores value and same is first charged to Revenue Account. The application of this fund is to write off the book value of obsolete and unserviceable stores items.

16) **BEST Group Insurance Fund (Non-Statutory Fund)**

The said fund is created with the approval of BEST Committee & Corporation in the year 2014-15. The said fund is utilized to make the payment of Financial aid to the legal heirs of deceased members/ employees/officers along with payment under "The B.E.S. & T. Undertaking's Group Insurance Scheme".

17) **Fixed Assets:-**

i) The Fixed Assets are stated at Cost of Acquisition and net of Government Grants received from State&Central Government and consumers capital connection fees.

ii) The assets of General Administration Department which are made available to both the divisions are apportioned on 50:50 basis.

iii) Capital Work in – Progress includes Capital Stock in hand.

iv) Assets retired from active use and awaiting disposal have not been itemized.

18) **Inventory:-**

i) Stock of stores and consumables comprised of spares are valued at cost.

M. M. NATHURIA & ASSOCIATES
MUMBAI
M. No. 49425
CHARTERED ACCOUNTANTS

ii) Scrap declared but not disposed off is valued at expected average realizable sale rate.

iii) Purchases are charged to revenue account and stock taken at the year end.

19) Investment: -

Long term investments are stated at cost. Provision is generally made for diminution in realizablevalue other than temporary in nature.

20) Bank Balances: -

There were no separate designated bank accounts for Electric Supply Division till the Financial Year 2007-08. Since the Financial Year 2008-09 the bank accounts are designated. However, funds are utilized for Transport Division as& when required andvice-versa.

21) Statutory Contribution to M.M.C. Fund:

Due to deficitduring the year, the statutory contribution to the Municipal Fund as required under section 460KK(2)(e) amounting to Rs.40 lakhs have not paid and not reflected under Trade Payables.

22) Fixed & Call with Chetana Co-operative Bank

The Undertaking has invested an amount of Rs. 167.32 lakhs with Chetana Co-operative Bank Ltd. in the F.Y. 1989-90. Out of this, an amount of Rs.1.00 lakh was received on 20.11.1995 from the liquidator of the Bank. The said Bank is in liquidation and the matter is pending in the Court of Law.

23) Generation of Electricity Fund Investment: -

The BEST Undertaking has invested certain Provident Fund amount in Bonds issued by Madhya Pradesh Electricity Board and Uttar Pradesh Co-op. Spinning Mills from FY 1994-95 to 1998-99.

These Bonds issuing Companies had defaulted in payment of interest as and when it was due. Hence the Undertaking had filed suits in various Court of Law against both these companies. In turn, the Madhya Pradesh Electricity Board has made the payment of principal amount invested by the Undertaking and have not made the payment of interest thereon. As such, suit for recovery of interest thereon against this Company is pending in the Court of Law.

As regard to amount invested in UPCSMFL Bonds 2003, UPCSMFL Bonds 2004, the Company has neither made payment of principal amount nor interest thereon hence the

M.M. MATHURIA & ASSOCIATES
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Undertaking had filed suit for recovery of principal amount and interest against this Company and these suits are pending for final hearing.

24) Contingent Liability: -

Term Deposit with Chetana Co-operative Bank -	Rs.	166.32 lakhs
Generation of Electricity Fund Investment -	Rs.	200 lakhs

25) Related Party Disclosures:-

As per the Accounting Standard (AS-18) on related party disclosure issued by The Institute of Chartered Accountants of India, the disclosure of transaction with related party as defined in the Accounting Standard is as follows: -

i) List of Related Parties and Relationships

Name of Related Parties	Relationship
Mumbai Municipal Corporation	BEST Undertaking is a Statutory Committee of the Mumbai Municipal Corporation.
BEST Committee	Competent Authority
Mr. Anil Diggikar, IAS	General Manager

The General Manager manages the affairs of BEST Undertaking, under the supervision and control of BEST committee and Mumbai Municipal Corporation.

ii) Transaction / Balance with MMC:-

Particulars/Natures	Type	Amounts in`. in Lakhs
Sale of Energy (Street Lighting)	Income	1121.68 (780.44)
Repairs of Street Lighting	Income	6971.85 (6360.72)
Permanent reinstatement of Cable Trenches	Expenditure	2644.52 (1034.92)

Note: Figures in brackets are of Previous Year.

M.M. MATHURIA & ASSOCIATES MUMBAI M. No. 49425 CHARTERED ACCOUNTANTS

26) Spark Green Energy vendor – Penalty on Interest free deposit is applicable due to delay, which is not provided in the current financial statements.

27) Previous year's figures have been regrouped/restated/reclassified where necessary.

28) Provision for Bad Debts are made amounting to Rs. 6.6 crores for FY 2023-24.

As per our attached report of even date

For M. M. Mathuria & Associates,
Chartered Accountants
FRN. 115354W

M. M. MATHURIA & ASSOCIATES CHARTERED ACCOUNTANTS MUMBAI M. No. 49425

Mr. Manoj Mathuria
(Proprietor)
M. No. 049425
Place: Mumbai

Dated:30th September,2024

UDIN : 24049425BKETAY8206

For Brihan Mumbai Electric
Supply &Transport Undertaking

GAO&FA(Delegation)

Mr. Anil Diggikar
General Manager

30/X/24

Brihan Mumbai Electric Supply & Transport Undertaking
Balance Sheet of Electric Supply as at 31st March 2024

EQUITY AND LIABILITIES	Notes	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
Shareholders' funds			
Reserves and surplus	2	483,379.33	466,672.24
		483,379.33	**466,672.24**
Non-current liabilities			
Long- Term Borrowings	3	192,624.85	**214,890.57**
Other non-current liabilities	4	56,631.54	53,171.66
		249,256.39	**268,062.23**
Current liabilities			
Trade payables	5	48,010.98	6,514.23
Other current liabilities	6	245,079.01	281,542.80
		293,090.00	**288,057.03**
TOTAL		**1,025,725.72**	**1,022,791.49**
ASSETS			
Non-current assets			
Fixed assets			
Tangible assets	7	162,306.93	160,901.27
Capital work-in-progress		4,603.68	4,174.89
Non-current investments	8	7,022.01	7,570.01
Long-term loans and advances	9	6,073.26	6,063.26
Other non-current assets	10	1,368.58	1,325.83
		181,374.46	**180,035.25**
Current assets			
Inventories	11	965.80	1,230.19
Trade receivables	12	52,803.15	42,259.34
Cash and Bank Balances	13	177,483.85	293,340.39
Short-term loans and advances	14	611,158.80	503,981.28
Other current assets	15	1,939.89	1,945.04
		844,351.49	**842,756.24**
TOTAL		**1,025,725.72**	**1,022,791.49**
Significant accounting policies	1		

As per our report of even date

MANOJ M MATHURIA
Chartered Accountants
Registration No.: 115…

For Brihan Mumbai Electric Supply & Transport Undertaking

MANOJ M MATHURIA
~~Partner~~
M.No. 49425
Place: Mumbai
Date: 30th September, 2024

UDIN - 24049425BKETAY5-206

CAO&FA(Delegation)
Mr. Anil Diggikar
General Manager

Brihan Mumbai Electric Supply & Transport Undertaking

Statement of Profit and Loss for the period 01/04/2023 to 31/03/2024

	Notes	For the year ended 31st Mar. 2024 (in lakhs)	1st April 2022 - 31st Mar. 2023 (in lakhs)
Income			
Revenue from operation (gross)	16	427,821.77	360,797.03
Less: Excise duty			-
Revenue from operation (net)		**427,821.77**	**360,797.03**
Other income	17	6,460.03	8,179.23
Total Revenue		**434,281.80**	**368,976.26**
Expenses			
Purchase of electricity		316,641.06	377,499.49
Emloyee benefit expense	18	58,468.06	59,532.90
Finance cost	19	17,514.65	11,922.75
Depreciation	7	11,304.33	10,928.82
Other expenses	20	22,120.87	18,075.91
Total expenses		**426,048.98**	**477,959.86**
Profit before tax and Exceptional items		**8,232.82**	**(108,983.60)**
Exceptional items		-	0.00
Profit before tax		**8,232.82**	**(108,983.60)**
Significant accounting policies	1		

As per our report of even date

MANOJ M MATHURIA
Chartered Accountants
Registration No.: 115356W

MANOJ M MATHURIA
~~Partner~~
M.No. 49425
Place: Mumbai
Date: 30th September, 2024

UDIN - 24049425BKEJAY5206

For Brihan Mumbai Electric Supply & Transport Undertaking

CAO&FA(Delegation)

Mr.Anil Diggikar, IAS
General Manager

Notes forming part of financial statement

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
2 RESERVES AND SURPLUS		
STATUTORY RESERVE		
(As per BMC Act, 1888)		
A. Sinking Fund for Public Loan	-	-
Addition during the year	-	-
	-	-
Less: Deduction During the Year		
	-	-
B. *Best Staff Benefit Fund	333.11	296.65
Addition during the year	60.72	36.46
	393.83	333.11
Less: Adj/Deduction During the Year	-	-
	393.83	**333.11**
C. Motor Vehicles(Third Party Ins Reserve)		
Addition/ Adj during the year		
Less: Adj/Deduction During the Year		
Total of A+B+C	**393.83**	**333.11**
NON-STATUTORY RESERVE		
D. Property Insurance Reserve	10,014.73	10,014.73
Addition during the year	-	-
	10,014.73	10,014.73
Less:Adj/ Deduction During the Year	-	-
	10,014.73	**10,014.73**
E. Third Party Insurance Reserve		
Addition during the year		
Less: Deduction During the Year		
F. Depreciation Fund		
Addition during the year	0.00	(0.10)
	0.00	(0.10)
Less: Deduction during the year		
	0.00	(0.10)
G. Fidelity Insurance Reserve	7.03	7.03
Addition/Adj during the year	-	-
	7.03	7.03
Less: Adj/Deduction During the Year	-	-
	7.03	**7.03**

M. M. MATHURIA & ASSOCIATES
MUMBAI
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CHARTERED ACCOUNTANTS

Notes forming part of financial statement

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
H. Grant/Consumer Cont.	40,585.12	36,631.00
Addition/ Adj during the year	4,332.01	3,954.12
	44,917.13	40,585.12
Less: Deduction / Adjustments During the Year		
	44,917.13	**40,585.12**
I. BEST Group Ins. Fund	(11.91)	(11.91)
Addition during the year	11.91	0.00
	0.00	(11.91)
Less: Deduction/Adj During the Year		
	0.00	**(11.91)**
J. Electric Supply Contingencies Reserve	7,658.64	6,897.10
Addition/Adj during the year	798.14	761.55
	8,456.79	7,658.64
Less: Deduction During the Year	-	-
	8,456.79	7,658.64
less: Invested amount as per regulation & investable amount	-	-
	8,456.79	**7,658.64**
K. * Generation Of Electricity Fund	19,687.30	19,687.30
Addition/Adj during the year	-	-
	19,687.30	19,687.30
Less: Deduction During the Year		
	19,687.30	**19,687.30**
Total of D+E+F+G+H+I+K	**83,082.98**	**77,940.82**
J. *Minimum Cash Balance as per Section 460KK1	0.50	0.50
Addition/Adj during the year		
	0.50	0.50
Less: Deduction During the Year		
	0.50	**0.50**
K. B. E. S. T. Staff Amenities Reserve	0.30	**0.30**
Provided during the year	-	-
	0.30	**0.30**
Less: Deduction During the Year	-	-
	0.30	**0.30**
L. Obsolescence of stores	14.53	10.53
Addition/Adj during the year		
	14.53	10.53
Less: Deduction / Adjustments During the Year	-	-
	14.53	**10.53**
M. Surplus		
Opening balances as per last financials	388,386.88	494,728.29
Add: Profit/(Loss) for the year	8,232.82	(108,983.60)
Add: Prior period items	4,065.62	3,403.74
	400,685.32	**389,148.43**
Deduct : Transfer to Contingency reserve fund	(798.14)	(761.55)
	399,887.18	**388,386.88**
Total of J+ K+L+M	**399,902.51**	**388,398.21**
Total	**483,379.33**	**466,672.14**

M. M. MATHURIA & ASSOCIATES ★ CHARTERED ACCOUNTANTS ★ MUMBAI M. No. 49425

Notes forming part of financial statement

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
3 Long-term borrowings		
Secured loan		
Secured against first charge on plant & machinery from Canara Bank^		
Long Term finance *	-	158,384.22
Unsecured loan		
APDRP Loan**	232.37	453.95
Short Term Finance *	34,333.33	32333.33
REC #	19,765.89	23,719.06
TATA BILL Discounting	138,293.26	-
	192,624.85	**214,890.57**

^ Rate of Interest 12.95% and secured against first charge on plant & machinery

** The maturity period of the loan will be 20 years and repayments being made in 20 installments. The loan carries interest @ 10.50%.

* The repayment to be made in 6 monthly installments. The loan carries interest @ 10.00%

Rate of Interest 11.75%

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
4 Other Non-Current Liabilities		
Security Deposit		
- Deposit from Employees	34.51	35.87
- Deposit from Customer	56,597.03	53,135.79
	56,631.54	**53,171.66**

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
5 Trade payables	48,010.98	6514.23
	48,010.98	**6,514.23**

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
6 Other current liabilities		
Statutory Liabiliities (Contributions to PF,Pension, ESIC, withholding Taxes,VAT etc.)	184,414.29	177,907.97
Empolyee dues payable	2,893.66	35,956.04
Current maturities for long term borrowings	-	
Other payables	57,771.06	67,678.79
	245,079.01	**281,542.80**

M. M. MATHURIA & ASSOCIATES MUMBAI M. No. 494 CHARTERED ACCOUNTANTS

SCHEDULE 7

FIXED ASSE AS AT 31ST MARCH, 2024

PARTICULARS	TOTAL AS AT 31ST MAR,2023	ADDITIONS DURING FY 2023-24	DEDUCTION IN RESPECT OF ASSETS WRITTEN OFF	ADJUSTMENT IN RESPECT OF TRANSFER	TOTAL AS AT 31ST MARCH,2024	ACCUMULATED DEPRECIATION AS ON 31ST MARCH, 2024	NET VALUE AS ON 31ST MARCH, 2024
LAND	435.18	-	-	-	435.18	-	435.18
BUILDINGS	12,713.86	129.46	-	-	12,843.33	7,456.20	5,387.13
PLANT & MACHINERY	1,31,320.73	4,160.02	330.68	9.89	1,35,159.97	80,191.37	54,968.60
CABLES & MAINS / PILLARS/ST.LIGHTING	1,31,865.03	6,959.79	115.39	-	1,38,709.43	59,195.48	79,513.95
METERS AND INSTALLATIONS	15,171.34	1.01	443.72	-	14,728.63	9,661.70	5,066.94
STREET LIGHTING LAMPS	16,818.37	282.71	-	-	17,101.08	6,151.66	10,949.41
D. E. A. ON HIRE	4.20	-	-	-	4.20	3.45	0.75
MOTOR VEHICLES	1,405.06	7.26	336.47	(8.87)	1,066.98	829.46	237.52
TOOLS AND EQUIPMENTS	4,969.83	7.49	4.82	-	4,972.50	2,270.84	2,701.65
FURNITURE AND OFFICE EQUIPMENTS	4,971.93	1,324.45	259.57	2.95	6,039.76	2,997.24	3,042.52
SECURITY EQUIPMENTS	16.30	-	-	-	16.30	13.02	3.28
TOTAL	3,19,691.84	12,872.21	1,490.66	3.97	3,31,077.35	1,68,770.41	1,62,306.93

M. M. MATHURIA & ASSOCIATES ★ CHARTERED ACCOUNTANTS ★ MUMBAI

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
8 Non-current investments		
Unquoted Bond		
General Securities :		
8.20% Oil Bond 2023	-	324.00
8.83%IRFC Bond 2034	350.00	350.00
9.97%APPFCL Bond 2024	-	110.00
9.97%APPFCL Bond 2024	-	230.00
	350.00	**1,014.00**
BEST Group Insurance Scheme Fund		
Central Bank of India Fort Branch		
Indian Bank Fort Branch		
Bank of India Electric House		
Punjab National Bank Colaba		
Central Bank of India Pedder Road Branch	-	-
Canara Bank Colaba	-	-
Syndicate Bank,Fort	-	-
State Bank of Patiala	-	-
	-	-
Generation of Electricity Fund Investment	200.00	200.00
Unquoted Shares		
Shares in Saraswat Co-op Bank	0.01	0.01
Contingencies Reserve Fund Investment	6,472.00	6,356.00
	6,472.01	**6,556.01**
Total	**7,022.01**	**7,770.01**

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
9 Long term Loans and advances		
(Unsecured, Considered good)		
Deposits	6,073.26	6,063.26
	6,073.26	**6,063.26**

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
10 Other Non - Current Assets (Considered good)		
Deferred Revenue Expenditure		
Staff Benefit Fund Investment (Fixed Deposit)	731.25	688.50
Fixed Deposit with Chetna Co - operative Bank	166.32	166.32
Term Deposit with Canara Bank for LC	471.01	471.01
	1,368.58	**1,325.83**

M. M. MATHURIA & ASSOCIATES
MUMBAI
M. No.
49425
CHARTERED ACCOUNTANTS

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
11 Inventories		
Inventories	965.80	1,230.19
	965.80	**1,230.19**

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
12 Trade receivables		
Unsecured, considered good stated otherwise		
Debts outstanding for a period exceeding six months from the date they are due for payment	**39,575.29**	**27,512.58**
	39,575.29	**27,512.58**
Other receivables	13,227.87	**14,746.76**
	13,227.87	**14,746.76**
Total	**52,803.15**	**42,259.34**

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
13 Cash and bank balances		
Cash and cash equivalents		
Balance with banks in Current accounts	199,350.32	303,944.57
Cash on hand	(21,866.47)	(10,604.18)
	177,483.85	**293,340.39**
Balance in banks for margin money		
Staff Benefit Fund Investment (Fixed Deposit)	731.25	688.50
Fixed Deposit with Chetna Co - operative Bank	166.32	166.32
Term Deposit with Canara Bank for LC	471.01	471.01
CLTD A/C (FAME) WITH BANK OF INDIA		
	1,368.58	**1,325.83**
Less: Shown under other non current assets	(1,368.58)	(1,325.83)
	177,483.85	**293,340.39**

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
14 Short term Loans and advances		
(Unsecured, Considered good)		
Deposits		
Other loans and advances		
Loans to employees	50.79	67.04
Prepaid expenses	325.06	378.01
Advances recoverable in cash or kind		
- Others	6,270.44	2,937.14
- From Transport Division	605,634.42	501,333.12
- From suppliers	(1,121.91)	(734.03)
	611,158.80	**503,981.28**

M. M. MATHURIA & ASSOCIATES MUMBAI M. No. 49425 CHARTERED ACCOUNTANTS

15 Other current assets

	As at 31st March 2024 (in lakhs)	As at 31st March 2023 (in lakhs)
Interest Accrued but not received :		
Accrued Interest On contingencey reserve	157.06	162.21
Interest Accrued On Fixed And Call Deposit	116.67	116.67
Accrued Interest On Generation Of Electricty Fund	1,666.16	1,666.16
Accrued Interest On Staff benefit Fund	-	-
Accrued Interest On BEST Group Insu. Fund	-	-
	1,939.89	**1,945.04**

M.M. MATHURIA & ASSOCIATES
MUMBAI
M. No.
CHARTERED ACCOUNTANTS

	Year ended 31ST MARCH,2024 (in lakhs)	Year ended 31ST MARCH,2023 (in lakhs)
16 Revenue from operations		
Sale of service	426,608.01	360,190.39
Other operating income		
Sale of Scrap	1,213.75	606.64
Revenue from operations (Gross)	**427,821.77**	**360,797.03**
Sale of Service		
Distribution of energy by meter	418,514.48	352954.28
Distribution of energy	1,121.68	875.39
Repairs & Maintenance of Street lighting	6,971.85	6360.72
	426,608.01	**360,190.39**
17 Interest income on		
Bank deposits	67.90	55.40
Rent of Building & land	399.32	628.95
D P charges	1,606.58	3915.87
Profit on Sale of Assets	983.94	983.94
Miscellaneous income	2,236.43	19.87
Discount, sundry balances written back	437.27	2337.29
Advertisement receipts	728.59	237.90
	6,460.03	**8,179.23**

M. M. MATHURIA & ASSOCIATES
MUMBAI
M. No. 49425
CHARTERED ACCOUNTANTS

	Year ended 31ST MARCH,2024 (in lakhs)	Year ended 31ST MARCH,2023 (in lakhs)
18 Employee benefit expense		
Salaries, wages and bonus	44,061.77	44,107.09
Contribution to provident and	14,216.18	15,223.60
Staff welfare expense	190.11	202.21
	58,468.06	**59,532.90**
19 Finance cost		
Interest expense	14,950.98	11,095.60
Other borrowing cost	2,563.68	827.14
	17,514.65	**11,922.75**
20 Other expenses		
Power, Fuel and Electricity	453.28	503.55
Rent	1,210.78	1,311.76
Repairs and Maintenance		
Building	669.32	773.67
Machinery	286.39	358.09
Others	3,177.41	3,393.36
Insurance	-	-
Incentive charges	1,600.24	1,236.67
Advertisement Expenses	171.31	72.15
Network charges	3,237.67	1,677.15
Payment to Auditors (Refer details Below)	300.00	250.00
Printing and Stationery	182.99	182.70
Communication cost	676.48	707.69
Travelling and Conveyance	1,448.61	1,677.53
Legal and Professional Fees	438.36	405.91
Rates and taxes	1.43	207.90
Bad debts	660.00	565.00
Bank Charges	368.36	352.10
Discount on Electricity charges	2,622.51	2,260.17
Permanent Reinstatement	2,644.52	1,034.92
Other Establishment Expenses	1,884.59	923.17
Best staff amenities reserve expense	82.57	178.37
Property insurance fund	-	-
Provision for Obsolescence of stores	4.05	4.05
Transfer to MCGM u/s 460 KK(2)e		
	22,120.87	**18,075.91**

Payment to auditors

As auditor		
Audit fee	300.00	250.00
Tax audit fee		
Limited review		
	300.00	**250.00**

M. M. MATHURIA & ASSOCIATES
M. No. 59425
CHARTERED ACCOUNTANTS

UDIN:	24049425BKETAY5206
MRN/Name:	049425/MANOJ MAHENDRA MATHURIA
Firm Registration No.:	115354W
Document type:	Certificates
Document sub type:	Others
Document Date:	30-09-2024
Create Date/Time:	04-10-2024 | 11:07:54
Financial Figures/Particulars:	
Certifying Restated Data ofits Electricity Business & Dataunder MERC's (UniformRecording and Reporting ofInformation) Regulation —2009:	0
Certifying Restated Data ofits Electricity Business & Dataunder MERC's (UniformRecording and Reporting ofInformation) Regulation —2009:	0
FY:	2023-2024
Document description:	Certifying Restated Data ofits Electricity Business & Dataunder MERC's (UniformRecording and Reporting ofInformation) Regulation —2009

Annexure 3

THE BRIHAN MUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)
APPENDIX NO. E-1
GENERAL FINANCIAL STATISTICS 2022-2023.

2021-2022	PARTICULARS		2022-23
₹		₹	₹
	ELECTRIC SUPPLY INCOME		
29,90,17,54,121	Distribution of Energy by Meter	35,29,54,27,804	
7,86,76,541	Street Lighting sale of Energy	8,75,38,710	
49,63,43,277	Street Lighting -R.&M	63,60,72,339	
64,82,48,988	Other Receipts	54,39,56,390	
7,78,58,698	Share of General Admn. Receipts	33,46,30,315	
31,20,28,81,625	Total		36,89,76,25,558
	ELECTRIC SUPPLY EXPENDITURE		
23,03,39,23,843	Cost of Energy Purchased	28,60,96,49,735	
1,45,29,59,962	External Power Purchased	5,61,29,99,091	
2,55,42,00,000	Intra State Transmission Charges	2,54,20,00,131	
99,39,99,996	Standby Charges	98,53,00,008	37,74,99,48,965
28,03,50,83,801			
5,04,26,32,866	Establishment Cost		5,28,42,85,552
57,81,90,700	Admn.and Gen.Expenses		53,50,58,534
60,60,40,945	Repairs and Maintenance		65,43,30,533
55,23,42,120	Other Cost (includes Cont. Res. Fund & Interest on Consumer Deposit)		55,06,08,620
1,05,99,75,876	Depreciation		1,07,72,35,346
79,60,43,756	Share of Gen. Admn.		91,61,58,592
69,74,68,950	Interest on Loans		1,10,95,60,068
37,36,77,79,014	TOTAL		47,87,71,86,210
-6,16,48,97,389	SURPLUS / DEFICIT		-10,97,95,60,652

2021-2022	PARTICULARS		2022-23
₹		₹	₹
1,00,000	Minimum Cash balance B/F		1,00,000
	Excess of Expenditure over Income		
-6,16,48,97,389	Supply	-10,97,95,60,652	
-3,35,84,33,088	Buses	22,10,07,307	
	Excess of Income over Expenditure		
0	Supply	0	
	Buses		-10,75,85,53,345
-9,52,32,30,477	Total		-10,75,84,53,345
1,00,000	Minimum Cash Balance required under section 460KK (1) C/F		1,00,000
-9,52,33,30,477			-10,75,85,53,345
	Balance appropriated as under:-		
0	Transferred to Municipal Fund under section 460KK 2 (e)		0
0	Transferred to Generation of Electricity Fund		0
-9,52,33,30,477			-10,75,85,53,345
	Previous Year Accum. Surplus/Deficit		
52,96,08,23,681	Supply	49,29,37,63,363	
-75,00,23,34,893	Buses	-79,77,07,28,876	-30,47,69,65,513
-22,04,15,11,212	ACCUMULATED DEFICIT		
1,08,78,76,176	Prior Period Adjustment (CR)		1,23,82,39,386
-30,47,69,65,513	Balance C/F To Balancesheet		-39,99,72,79,472

Contd...

APPENDIX E-1 Contd....

2021-2022	PARTICULARS		2022-23	2021-2022	PARTICULARS		2022-23
₹		₹	₹	₹		₹	₹
	BUSES INCOME						
22,84,93,50,976	Passenger Receipts	29,04,35,22,445					
93,53,08,690	Other Receipts	1,00,55,92,765					
14,09,17,951	Share of Gen. Admn. Receipts	40,59,00,464					
23,92,55,77,617	Total		30,45,50,15,674				
	BUSES EXPENDITURE						
7,73,93,82,314	Fuel and Operating Materials		9,91,22,38,802				
16,07,40,57,512	Establishment Cost		17,40,99,44,242				
76,96,74,129	Admn.and Gen.Expenses		55,39,61,347				
55,43,49,431	Repairs and Maintenance		50,32,76,968				
11,57,31,186	Other Cost		5,68,14,715				
15,44,02,532	Depreciation		6,51,34,913				
35,11,76,099	Interest on Loans		27,39,00,500				
1,52,52,37,502	Share of Gen.Admn.		1,45,87,36,880				
27,28,40,10,705	TOTAL		30,23,40,08,367		TOTAL		
-3,35,84,33,088	SURPLUS / DEFICIT		22,10,07,307				

I Signed, subject to my Audit Report U/No.MCA/025/23-24/06 dtd.28/12/2022 on the 2022-23 Accounts of B.E.S. & T. Undertaking & Certificate U/No. MCA/025/23-24/05 dtd.28/12/2023 enclosed therein.

CAO & FA

Dy.C.M.(A)

Municipal Chief Auditor

General Manager

M. C. A. BMC DEPARTMENT

Municipal Chief Auditor

APPENDIX NO. E-2

DIVISIONAL INCOME AND EXPENDITURE STATEMENT FOR THE YEAR ENDED 31ST MARCH, 2023
ELECTRIC SUPPLY

2021-22	EXPENDITURE		2022-23	2021-22	INCOME		2022-23
₹		₹	₹	₹		₹	₹
23,03,39,23,843	Cost of Energy Purchased	28,60,96,49,735		29,90,17,54,121	Distribution of Energy by Meter		35,29,54,27,804
1,45,29,59,962	External Power Purchased	5,61,29,99,091					
2,55,42,00,000	Intra State Transmission Charges	2,54,20,00,131		7,86,76,541	Street Lighting Sale of Energy		8,75,38,710
99,39,99,996	Standby Charges	98,53,00,008	37,74,99,48,965				
28,03,50,83,801				49,63,43,277	Street lighting -R & M		63,60,72,339
				30,47,67,73,939			36,01,90,38,853
5,04,26,32,866	Establishment Cost (Supply)		5,28,42,85,552		**Other Receipts**		
49,60,26,774	Establishment Cost (Gen.Admn.)		63,58,94,308	4,56,885	Electricity Duty Collection	0	0
				14,30,98,510	Delayed payment Charges	14,03,90,442	
57,81,90,700	Admn.and Gen.Expenses (Supply)		53,50,58,534	1,78,82,956	Rent of Land & Building	1,92,83,247	
14,51,68,363	Admn.and Gen.Expenses (Gen.Admn.)		12,39,51,532	0	Advertisement	2,37,60,000	
				48,68,10,637	Miscellaneous	36,05,22,701	54,39,56,390
60,60,40,945	Repairs and Maintenance (Supply)		65,43,30,533	64,82,48,988			
9,03,51,371	Repairs and Maintenance (Gen.Admn.)		9,17,24,973				
47,87,89,627	Other Cost (Supply)		47,44,53,926				
4,87,10,409	Other Cost (Gen.Admn.)		4,89,41,468				
					Share of General Administration		
1,05,99,75,876	Depreciation (Supply)		1,07,72,35,346	7,78,58,698	Receipts		33,46,30,315
1,57,86,840	Depreciation (Gen.Admn.)		1,56,46,311				
69,74,68,950	Interest on Loans (Supply)		1,10,95,60,067	31,20,28,81,625	**TOTAL**		36,89,76,25,558
0	Interest on Loans (Gen.Admn.)		0				
	Provisions towards Electric Supply			-6,16,48,97,389	Deficit Transferred to Appropriation A/C		-10,97,95,60,652
7,35,52,493	Contingencies Reserve Fund		7,61,54,695				
37,36,77,79,014	**TOTAL**	**	47,87,71,86,210				
0	Surplus Trf. to Appropriation A/c		0				
37,36,77,79,014	**TOTAL**		**47,87,71,86,210**	**37,36,77,79,014**	**TOTAL**		**47,87,71,86,210**

** The total expenditures Includes 2196325488/- not covered by Current Budget Grant but awaiting Corporation's Sanction.

APPENDIX NO. E-3

DIVISIONAL INCOME & EXPENDITURE STATEMENT FOR THE YEAR ENDED 31ST MARCH, 2023.

BUSES

2021-22	EXPENDITURE		2022-23	2021-22	INCOME		2022-23
₹		₹	₹	₹		₹	₹
	Fuel and Operating Materials				**Traffic Earning From**		
2,00,98,44,004	C.N.G.Fuel	2,75,85,45,574		5,44,82,55,340	Sale of Tickets	4,88,37,97,879	
55,74,44,418	Fuel Oil	51,42,29,856		2,09,23,68,616	Sale of Tickets wet-lease Buses	2,27,00,04,977	
0	Electricity for Electric Buses	0					
4,32,77,278	Lubricants	3,61,44,918		16,43,73,169	Monthly Bus Passes	43,86,436	
9,28,09,570	Tyre and Tubes	7,58,81,286		49,92,005	Reserved Buses	81,53,226	
14,69,64,083	Tickets	27,26,31,507			Lump sum payment from Govt.		
4,88,90,42,961	Hiring Chgs. For Buses (wet-lease)	6,25,48,05,661	9,91,22,38,802	6,64,61,847	towards free travel by police personnel	5,43,79,927	7,22,07,22,445
7,73,93,82,314				7,77,64,50,977			
16,07,40,57,512	Establishment Cost (Buses)		17,40,99,44,242				
1,17,82,05,685	Establishment Cost (Gen.Admn.)		1,13,74,42,390	26,50,96,529	Advertisement Receipts	35,07,95,482	
76,96,74,129	Admn.and Gen.Expenses (Buses)		55,39,61,347	12,17,29,00,000	Grant from MCGM	21,82,28,00,000	
15,46,48,520	Admn.and Gen.Expenses (Gen.Admn.)		12,85,04,945				
				2,90,00,00,000	Grant from other than MCGM	0	
				50,79,30,150	Other Receipts	50,96,76,553	
55,43,49,431	Repairs and Maintenance (Buses)		50,32,76,968				
9,69,21,216	Repairs and Maintenance (Gen.Admn.)		9,68,95,234	4,71,92,259	Engineering Receipts	2,66,96,684	
11,57,31,186	Other Cost (Buses)		5,68,14,715	11,50,89,751	Rent of Bldg.and Land	11,84,24,046	22,82,83,92,765
7,96,75,241	Other Cost (Gen.Admn.)		8,02,48,000	16,00,82,08,689			
				14,09,17,951	Share of Gen.Admn. Receipts		40,59,00,464
15,44,02,532	Depreciation (Buses)		6,51,34,913	23,92,55,77,617	**Total**		30,45,50,15,674
1,57,86,840	Depreciation (Gen.Admn.)		1,56,46,311				
				-3,35,84,33,088	Deficit Transferred to Appropriation A/c.		22,10,07,307
35,11,76,099	Interest on Loans (Buses)		27,39,00,500				
0	Interest on Loans (Gen.Admn.)						
27,28,40,10,705	**Total**	**	**30,23,40,08,367**	**27,28,40,10,705**	**Total**		**30,23,40,08,367**

** The total Expenditure Includes 2589553650/-not covered by Current Budget Grant but awaiting Corporation's Sanction.

APPENDIX NO. E-4

APPROPRIATION ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2023

PARTICULARS			2021-2022 ₹		2022-2023 ₹
MINIMUM CASH BALANCE B/F - SUPPLY			50,000		50,000
BUSES			50,000		50,000
ELECTRIC SUPPLY :--- SURPLUS / DEFICIT(APPENDIX E-1)			-6,16,48,97,389		-10,97,95,60,652
BUSES :--- SURPLUS / DEFICIT (APPENDIX E-1)			-3,35,84,33,088		22,10,07,307
TOTAL			**-9,52,32,30,477**		**-10,75,84,53,345**
SUPPLY			-6,16,48,47,389		-10,97,95,10,652
BUSES			-3,35,83,83,088		22,10,57,307
LESS--- TRANSFERRED TO MUNICIPAL FUND UNDER SEC 460 KK (2) (e)					
SUPPLY			0		0
BUSES			0		0
LESS---MINIMUM CASH BALANCE REQUIRED UNDER SECTION 460 KK (1) C/F					
SUPPLY			50,000		50,000
BUSES			50,000		50,000
LESS---TRANSFERRED TO GENERATION OF ELECTRICITY FUND			0		0
TOTAL SUPPLY			**-6,16,48,97,389**		**-10,97,95,60,652**
BUSES			**-3,35,84,33,088**		**22,10,07,307**
PREVIOUS YEAR ACCUMULATED SURPLUS / DEFICIT					
SUPPLY			52,96,08,23,681		49,29,37,63,363
BUSES			-75,00,23,34,893		-79,77,07,28,876
ACCUMULATED SURPLUS / DEFICIT					
SUPPLY			46,79,59,26,292		38,31,42,02,711
BUSES			-78,36,07,67,981		-79,54,97,21,569
PRIOR PERIOD ADJUSTMENT (NET)					
SUPPLY		CR	2,49,78,37,071	CR	34,03,73,974
BUSES		DR	1,40,99,60,895	CR	89,78,65,412
BALANCE SURPLUS /DEFICIT CARRIED FORWARD			**-30,47,69,65,513**		**-39,99,72,79,472**
SUPPLY			**49,29,37,63,363**	**	**38,65,45,76,685**
BUSES			**-79,77,07,28,876**		**-78,65,18,56,157**

I Signed, subject to my Audit Report U/No.MCA/025/22-23/06 dtd.28/12/2023 on the 2022-23 Accounts of B.E.S.&T. Undertaking & Certificate U/No. MCA/025/22-23/05 dtd.28/12/2023 enclosed therein.

M. C. A. BMC DEPARTMENT

CAO & FA | Dy.M.(A) | Municipal Chief Auditor | General Manager

ANNEXURE :- 'A'

ALLOCATION OF GENERAL ADMINISTRATION INCOME FOR THE YEAR ENDED 31ST MARCH, 2023

AMOUNT 2021-2022	ALLOCATION ELE. SUPPLY	ALLOCATION BUSES	PARTICULARS	AMOUNT 2022-2023	ALLOCATION ELE. SUPPLY	ALLOCATION BUSES
₹	₹	₹		₹	₹	₹
8424105	7581694	842411	A) Interest on Deposits & Other Investments	6155301	5539770	615530
			B) MISCELLANEOUS:			
1432441	716220	716221	1) Apprentices Premium etc.	3852414	1926207	1926207
93147085	23286772	69860313	2) Rent of Buildings & Land	174448394	43612099	130836296
50489118	13632062	36857056	3) Sale of Stores & Scrap Material etc. (Net)	110298079	60663943	49634136
65223900	32611950	32611950	4) Other Receipts	445716592	222858296	222858296
60000	30000	30000	5) Advertisement Receipts	60000	30000	30000
218776649	**77858698**	**140917951**	**TOTAL**	**740530779**	**334630315**	**405900464**

ANNEXURE :-B

ALLOCATION OF GENERAL ADMINISTRATION EXPENDITURE FOR THE YEAR 2022-2023

AMOUNT 2021-2022	SUPPLY 2021-2022	BUSES 2021-2022	PARTICULARS	AMOUNT 2022-2023	SUPPLY 2022-2023	BUSES 2022-2023
₹	₹	₹		₹	₹	₹
			ESTABLISHMENT COST			
6,40,56,418	3,20,28,209	3,20,28,209	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	7,16,58,646	3,58,29,323	3,58,29,323
12,82,24,976	6,41,12,488	6,41,12,488	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	14,20,96,659	7,10,48,329	7,10,48,329
1,33,44,409	66,72,204	66,72,205	PUBLIC RELATION DEPARTMENT	1,69,22,602	84,61,301	84,61,301
2,73,42,894	1,36,71,447	1,36,71,447	LEGAL DEPARTMENT	2,39,89,965	1,19,94,982	1,19,94,982
11,60,29,259	5,80,14,629	5,80,14,630	INTERNAL AUDIT	11,31,98,533	5,65,99,266	5,65,99,266
7,93,47,803	3,96,73,902	3,96,73,901	MATERIAL MANAGEMENT	7,70,00,128	3,85,00,064	3,85,00,064
68,59,91,580	10,28,98,737	58,30,92,843	SECURITY AND VIGILANCE	63,87,77,739	15,96,94,435	47,90,83,304
11,84,34,927	5,32,95,717	6,51,39,210	CHIEF ENGINEER CIVIL & DRAWING OFFICE	19,82,12,495	8,91,95,623	10,90,16,872
11,99,16,954	2,39,83,391	9,59,33,563	TIME KEEPING	11,38,42,894	2,16,30,150	9,22,12,744
3,35,08,696	67,01,739	2,68,06,957	PERSONNEL	4,59,27,662	87,26,256	3,72,01,406
4,10,49,239	82,09,848	3,28,39,391	WELFARE	4,52,86,708	86,04,475	3,66,82,234
12,64,45,299	2,52,89,060	10,11,56,239	MEDICAL	12,71,22,891	2,41,53,349	10,29,69,541
12,05,40,005	6,14,75,403	5,90,64,602	INFORMATION TECHNOLOGY DEPARTMENT	14,53,79,109	9,44,96,421	5,08,82,688
-	-	-	GENERAL ADMINISTRATION	1,39,20,669	69,60,335	69,60,335
						-
1674232459	**496026774**	**1178205685**	**TOTAL ESTABLISHMENT COST**	**1,77,33,36,698**	**63,58,94,308**	**1,13,74,42,390**
			ADMINISTRATION & GENERAL EXPENSES			
27,09,273	13,54,637	13,54,636	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	37,33,423	18,66,712	18,66,712
32,45,755	16,22,877	16,22,878	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	43,04,671	21,52,336	21,52,335
7,74,886	3,87,443	3,87,443	PUBLIC RELATION DEPARTMENT	9,69,779	4,84,889	4,84,889
21,87,638	10,93,819	10,93,819	LEGAL DEPARTMENT	49,90,379	24,95,190	24,95,190
25,35,021	12,67,510	12,67,511	INTERNAL AUDIT	3,81,947	1,90,974	1,90,974
33,07,942	16,53,971	16,53,971	MATERIAL MANAGEMENT	1,09,24,913	54,62,456	54,62,456
59,36,540	8,90,481	50,46,059	SECURITY AND VIGILANCE	37,98,311	9,49,578	28,48,733
84,80,898	38,16,404	46,64,494	CHIEF ENGINEER CIVIL & DRAWING OFFICE	1,07,91,267	48,56,070	59,35,197
5,50,689	1,10,138	4,40,551	TIME KEEPING	2,11,294	40,146	1,71,148
25,54,624	5,10,925	20,43,699	PERSONNEL	25,98,622	4,93,738	21,04,884
4,71,416	94,283	3,77,133	WELFARE	12,41,865	2,35,954	10,05,911
79,45,810	15,89,162	63,56,648	MEDICAL	61,84,648	11,75,083	50,09,565
91,66,016	46,74,668	44,91,348	INFORMATION TECHNOLOGY DEPARTMENT	48,80,889	31,72,578	17,08,311
24,99,50,374	12,61,02,044	12,38,48,330	GENERAL ADMINISTRATION	19,74,44,469	10,03,75,829	9,70,68,640
299816882	**145168362**	**154648520**	**TOTAL ADMINISTRATION & GENERAL EXPENSES**	**25,24,56,478**	**12,39,51,532**	**12,85,04,946**

Contd...

AMOUNT 2021-2022	SUPPLY 2021-2022	BUSES 2021-2022	PARTICULARS	AMOUNT 2022-2023	SUPPLY 2022-2023	BUSES 2022-2023
₹	₹	₹		₹	₹	₹
			REPAIRS & MAINTENANCE			
5,77,070	2,88,535	2,88,535	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	3,38,105	1,69,052	1,69,052
5,05,488	2,52,744	2,52,744	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	8,05,721	4,02,861	4,02,861
11,261	5,630	5,631	PUBLIC RELATION DEPARTMENT	39,105	19,552	19,552
1,03,515	51,758	51,757	LEGAL DEPARTMENT	1,04,585	52,292	52,292
1,57,049	78,525	78,524	INTERNAL AUDIT	3,15,994	1,57,997	1,57,997
3,55,139	1,77,569	1,77,570	MATERIAL MANAGEMENT	8,50,421	4,25,210	4,25,210
15,17,340	2,27,601	12,89,739	SECURITY AND VIGILANCE	13,35,361	3,33,840	10,01,521
4,53,08,040	2,03,88,618	2,49,19,422	CHIEF ENGINEER CIVIL & DRAWING OFFICE	4,55,03,030	2,04,76,364	2,50,26,667
2,23,303	44,660	1,78,643	TIME KEEPING	3,58,287	68,075	2,90,213
2,58,958	51,792	2,07,166	PERSONNEL	1,73,073	32,884	1,40,189
3,29,419	65,884	2,63,535	WELFARE	1,03,065	19,582	83,483
9,01,117	1,80,223	7,20,894	MEDICAL	2,76,805	52,593	2,24,212
25,38,735	12,94,755	12,43,980	INFORMATION TECHNOLOGY DEPARTMENT	20,42,283	13,27,484	7,14,799
13,44,86,152	6,72,43,076	6,72,43,076	GENERAL ADMINISTRATION	13,63,74,371	6,81,87,185	6,81,87,185
18,72,72,586	**9,03,51,370**	**96921216**	**TOTAL REPAIRS & MAINTENANCE**	**18,86,20,206**	**9,17,24,972**	**9,68,95,234**
			OTHER COST			
1,107	553	554	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	-	-	-
70,210	35,105	35,105	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	-	-	-
64,276	32,138	32,138	PUBLIC RELATION DEPARTMENT	81,824	40,912	40,912
-	-	-	LEGAL DEPARTMENT	-	-	-
-	-	-	INTERNAL AUDIT	20,000	10,000	10,000
20,182	10,091	10,091	MATERIAL MANAGEMENT	-	-	-
1,53,884	23,083	1,30,801	SECURITY AND VIGILANCE	72,587	18,147	54,440
-	-	-	CHIEF ENGINEER CIVIL & DRAWING OFFICE	6,415	2,887	3,528
-	-	-	TIME KEEPING	-	-	-
-	-	-	PERSONNEL	-	-	-
3,42,51,885	68,50,377	2,74,01,508	WELFARE	3,57,37,802	67,90,182	2,89,47,620
89,65,245	17,93,049	71,72,196	MEDICAL	79,93,700	15,18,803	64,74,897
-	-	-	INFORMATION TECHNOLOGY DEPARTMENT	-	-	-
8,48,58,861	3,99,66,013	4,48,92,848	GENERAL ADMINISTRATION	8,52,77,139	4,05,60,537	4,47,16,603
12,83,85,650	**48710409**	**79675241**	**TOTAL OTHER COST**	**12,91,89,468**	**4,89,41,468**	**8,02,48,000**
31573680	15786840	15786840	**DEPRECIATION**	3,12,92,622	1,56,46,311	1,56,46,311
2321281258	**796043756**	**1525237502**	**TOTAL OF GENERAL ADMINISTRATION**	**2,37,48,95,472**	**91,61,58,592**	**1,45,87,36,881**

APPENDIX NO. E- 5

BALANCE SHEET AS AT 31ST MARCH, 2023.

2021-22		LIABILITIES		2022-23	2021-22		ASSETS		2022-23
₹			₹	₹	₹			₹	₹
		FUNDS					NET FIXED ASSETS		
0	1)	Revenue Reserve Fund Section 460 LL (1) (a)			38,32,88,78,533	1)	Fixed Capital Expenditure (E-6)	39,73,24,91,534	
0	2)	BEST Betterment Fund Section 460LL (1) (b)			-18,87,11,38,874		Less : Accumulated Depreciation	-19,62,11,57,547	
30,000	3)	Welfare Fund Section 460 LL (1) (c)		30,000	37,46,96,283	2)	Capital Work - in - Progress *	44,14,06,352	
					19,83,24,35,942				20,55,27,40,339
1,87,36,18,672	4)	Property Insurance Fund		1,87,97,27,265			INVESTMENT		
30,00,000	5)	Fidelity Insurance Fund		30,00,000	10,14,00,000	1)	General Investment (E - 7)	10,14,00,000	
	6)	General Fund		0	2,00,00,000	2)	Generation of Electricity Fund Investment	2,00,00,000	
18,87,11,38,875	7)	Depreciation Fund	19,62,11,57,547		1,250	3)	Shares in Co-Op. Banks	1,250	
-18,87,11,38,874		Less - Provision	-19,62,11,57,547	0	14,70,00,000	4)	BEST Staff Benefit Fund Investment	15,30,00,000	
1					1,67,33,321	5)	Fixed & Call Deposits with Banks.	1,60,15,467	
2,52,00,000	8)	Passenger Insurance Fund		2,52,00,000	51,16,00,000	6)	Contingencies Reserve Fund Investment	63,56,00,000	
	9)	Financial Asst. Recd. from Various Sources			0	7)	BEST Group Insurance Scheme Fund		
8,98,62,01,154		(i) Financial Asst.from State/Central Govt.	9,00,87,74,731		79,67,34,571				92,60,16,717
0		(ii) Non-Refundable Premium					CURRENT ASSETS		
7,71,43,777		(iii) Capital Connection Fees	10,35,12,073		60,00,00,000	1)	Interest Free Deposit for Renewal Power Purcha	60,00,00,000	
0		(iv) RDSS Grant	29,19,00,000	9,40,41,86,804		2)	Interest Accrued on Fixed & Call		
10,96,51,63,604				11,31,21,44,069	20,14,60,179		Deposits and General Investment	20,71,00,588	
		Dedicated Fund			0	3)	Deferred Revenue Expenditure	0	
	1)	Electric Supply Contingencies Reserve Fund as per				4)	Securities Deposited by		
68,97,09,729		MERC from F. Y. 2008-09 onwards.	76,58,64,424		3,15,080		Employees,Consumers & Sundry Parties	3,15,080	
15,43,92,234	2)	Staff Benefit Fund	16,15,44,709		80,17,75,259				80,74,15,668
1,96,87,30,105	3)	Generation of Electricity Fund	1,96,87,30,105						
-38,19,323	4)	BEST Group Insurance Fund	-44,20,599			5)	Stock in Hand ##		
2,80,90,12,745				2,89,17,18,639	20,46,29,494		(a) Revenue		22,23,16,191
		LOAN FROM							
2,76,72,24,039		LOAN FROM RURAL ELECTRIFICATION CORPN. LTD.	2,37,19,06,319		0	6)	Work in Progress for outside parties		
0		Temporary Advance From MCGM	4,44,86,00,000		6,98,92,44,535	7)	Book Debts		6,85,09,24,416
36,17,69,200		World Bank Loan under MUTP	31,65,48,050			8)	Cash and Bank Balance		
6,75,52,880		APDRP Loan	4,53,94,960		2,99,41,21,121		(a) Cash on Hand	1,90,19,13,107	
1,85,22,00,000		Working Capital Demand loan with Canara	1,85,00,00,000		1,19,52,59,216		(b) With Banks	4,57,49,43,174	
11,85,37,61,329		TATA Power Bill Discouting Facilities	15,83,84,22,367		500		(c) Investment in Treasury Bill	500	
2,16,66,66,670		Short Term Assistance from Financial Institutions	75,00,00,001						
19,06,91,74,118				25,62,08,71,697	4,18,93,80,837				6,47,68,56,781
32,84,33,80,467		TOTAL C/F		39,82,47,34,405	32,81,42,00,638		TOTAL C/F		35,83,62,70,112

Contd....

2021-22	LIABILITIES		2022-23	2021-22	ASSETS		2022-23
₹		₹	₹	₹		₹	₹
32,84,33,80,467	TOTAL B/F		39,82,47,34,405	32,81,42,00,638	TOTAL B/F		35,83,62,70,112
	CURRENT LIABILITES				8) LOANS AND ADVANCES		
	A:- DEPOSITS FROM			20,77,262	a) Due from Staff	15,77,885	
3,34,82,852	(1) Employees	3,32,07,152		38,84,370	b) On Account Payment	38,73,945	
4,47,43,97,975	(2) Consumers	5,31,37,15,395		3,22,58,775	c) Festival Advance	3,59,49,276	4,14,01,106
-3,31,77,55,566	(3) Sundry Parties	3,43,07,97,309		56,39,19,168	d) Due from Suppliers	72,30,70,885	
3,15,080	(4) Govt. Securities	3,15,080		2,51,47,77,077	e) Due from Others	3,55,77,57,958	
1,19,04,40,341			8,77,80,34,936	2,96,62,161	f) Prepaid Expenses	4,28,01,421	
	B:- OTHER LIABILITIES FOR			504	g) Deposits with Suppliers	504	
				3,14,65,79,317			4,36,50,31,874
1,22,15,56,701	(1) Goods Supplied	1,85,17,52,283					
7,02,93,70,825	(2) Other Expenses	5,53,57,42,513			REVENUE ACCOUNTS		
10,03,21,83,322	(3) Other Finance	4,57,88,31,992		30,47,69,65,504	** Deficit As Per Revenue Accounts Upto 2022-2023		39,99,72,79,463
0	(4) Unclaimed Interest	0					
0	(5) Accrued Interest	0					
14,11,94,64,258	(6) Third Parties	19,62,72,47,350					
32,40,25,75,106			31,59,35,74,138				
	PROVISION FOR						
0	(1) BEST Staff Amenities Fund	0					
9,35,411	(2) Obsolescences of Stores	28,45,411					
0	(3) Third Party Insurance Fund	0					
3,14,134	(4) Motor Vehicle (Third Party Insurance Fund)	-7,07,441					
12,49,545			21,37,970				
1,00,000	Minimum Cash Balance Required under Sec. 460KK(1)		1,00,000				
66,43,77,45,459	TOTAL		80,19,85,81,449	66,43,77,45,459	TOTAL		80,19,85,81,449

* Includes Capital Stock in hand amounting to ₹ 35,99,99,259 i.e Supply ₹ 33,60,58,247 & Buses ₹ 2,39,41,012.

₹ 44,14,06,352 Includes CAPITAL STOCK of ₹ 35,99,99,259 & CWIP ₹ 8,14,07,093.

₹22,23,16,193 REVENUE STOCK

₹ 66,37,22,545

₹58,23,15,450 BALANCE AS PER LEDGER A/c586

₹8,14,07,093 CWIP AS PER LEDGER A/C 551

I Signed, subject to my Audit Report U/No.MCA/025/23-24/06 dtd.28/12/2023 on the 2022-23 Accounts of B.E.S. & T. Undertaking & Certificate U/No. MCA/025/23-24/05dtd.28/12/2023 enclosed therein.

M. C. A. BMC DEPARTMENT

CAO & FA 22/12/23 | Dy.C.M.(A) | Municipal Chief Auditor | General Manager

ANNEXURE :- 'C'

NOTES ON THE BALANCE-SHEET AS AT 31ST MARCH, 2023.

1. Stores and Material except scrap are valued at cost, scrap is valued at average sale rates.

2. Amount receivable under Court Decree Award from M/s.Madison Communication Pvt. Ltd. ₹.13,15,31,438.

3. Contingent Liability :

Claims against the Undertaking not acknoweldged as debt ₹ 16,71,53,653/- (Previous year ₹29,14,52,773/-) .

APPENDIX NO. E-6

FIXED CAPITAL EXPENDITURE AS AT 31ST MARCH, 2023

PARTICULARS	TOTAL AS AT 31ST MAR,2022		ADDITIONS DURING FY 2022-23	DEDUCTION IN RESPECT OF ASSETS WRITTEN OFF	ADJUSTMENT IN RESPECT OF TRANSFER (+) OR (-)	TOTAL AS AT 31ST MARCH,2023	ACCUMULATED DEPRECIATION AS ON 31ST MARCH, 2023	NET VALUE AS ON 31ST MARCH, 2023
GENERAL ADMINISTRATION								
LAND	41129692		0	0	0	41129692	0	41129692
BUILDINGS	786861935		400000	0	0	787261935	549610507	237651428
MOTOR VEHICLES	39295628		0	2837760	0	36457868	17735474	18722394
PLANT AND MACHINARY	38379262		0	0	0	38379262	29801033	8578229
FURNITURE AND OFFICE EQUIPMENTS	63058527		377371185	10651218	0	429778494	31859952	397918542
TOOLS AND EQUIPMENTS	2980347		150000	0	0	3130347	1821734	1308613
SECURITY EQUIPMENTS	3260388		0	0	0	3260388	2432064	828324
TOTAL	974965780		377921185	13488978	0	1339397987	633260764	706137223
ELECTRIC SUPPLY								
LAND	22953418		0	0	0	22953418	0	22953418
BUILDINGS	824262843		59729458	0	-6237000	877755301	430667163	447088138
PLANT & MACHINERY	12660786912	*	465264200	12864566	-302962	13112883584	7609785270	5503098314
CABLES & MAINS / PILLARS/ST.LIGHTING	12384533986	*	811677522	9262163	-446475	13186502870	5457715492	7728787378
METERS AND INSTALLATIONS	1602474461	*	10273216	95613784	0	1517133893	928421502	588712391
STREET LIGHTING LAMPS	1623029223	@	58807951	0	0	1681837174	560508606	1121328568
D. E. A. ON HIRE	419928		0	0	0	419928	344906	75022
MOTOR VEHICLES	138266692		0	15989559	0	122277133	101657197	20619936
TOOLS AND EQUIPMENTS	487828366		5716436	476110	2349024	495417716	206727063	288690653
FURNITURE AND OFFICE EQUIPMENTS	273357486	+	14416453	5470321	0	282303618	266599466	15704152
TOTAL	30017913315		1425885236	139676503	-4637413	31299484635	15562426665	15737057970
BUSES								
LAND	667872253		0	0	0	667872253	0	667872253
BUILDINGS	1274254111		19692492	0	0	1293946603	670748041	623198562
BUSES / MOH OF BUSES	4656054103	$	0	315606414	589646	4341037335	2407576741	1933460594
MOTOR VEHICLES/MOH OF MOTOR VEH.	121083496		0	2371200	0	118712296	80318993	38393303
PLANT AND MACHINERY	21360118		0	0	0	21360118	10072369	11287749
TOOLS AND EQUIPMENTS	104207707		101244	59438	0	104249513	72179449	32070064
FURNITURE AND OFFICE EQUIPMENTS	491167652	&	56553232	1290087	0	546430797	184574525	361856272
TOTAL	7335999441		76346967	319327139	589646	7093608915	3425470118	3668138797
GRAND TOTAL	38328878536		1880153388	472492620	-4047767	39732491537	19621157547	20111333990

$ Inlcudes 804 Nos of Buses (AC CNG 5Nos(2.75Cr) + Low Flooring CNG SD 549 Nos (127.19 Cr) + Midi CNG 250 Nos (49.97 Cr) under JNNURM amounting to Rs. 179.91 Crs.

* Includes expenditure Incurred Under Accelerated Power Development Reform Programme Scheme of Central Government From Financial Year 2001-02 to 2008-09 amounting to Rs.291.66 Crs (Rs.143.21 Crores Under Plant & Machinery,Rs. 64.52 Crs Under Cable & Mains, Rs.75.02 Crs Under Meters & Rs. 8.91 Crs Under Office Equipments)

* Includes Expenditure Incurred Under Business Process Automation Project (BPAP) Amounting to Rs.102.85 crs. (Rs.51.71 +0.10+00.39 +47.65+3.00Lakhs)

* IDC of Rs."0.44 (crore)" was brought into Books of Accounts in FY 2022-23

$ Includes expenditure incurred towards procurement of 185 Nos of SD TATA buses (Lot 1/303) Rs. 90.56 Cr & Electric Hybrid buses (Lot 1/6) 6 Nos of buses Rs. 9.84Cr against Rs .100.00 Crs grant received from MCGM and Tejaswini SD buses (Lot 1 / 37) of Rs. 10.92 Crs

+ Includes expenditure incurred towards procurement of Furniture & Office equipments of 42.61 lakhs under Skill Development at Traffic Training Centre, Dindoshi against Grant of Rs. 50.00 Lakhs received fr. Central govt.

Grant received under RDSS project Rs.29.19 Crs. From Central Govt. and Advance paid to L&T (Rs.4.67 crs.) + TATA power (Rs.24.52 crs.)

* Includes Plant & Machinery of Rs. 108.72+0.11 Crs(21-22)+1.21 Crs (22-23) = 110.04 against 60% grant of Rs. 56.98 Crs received from Central Govt for IPDS Project.

@ Includes expenditure incurred towards Street Lighting Lamps (Rs. 16.39+47.84 Crs (FY19-20) for LED Street Light Lanterns / flood lights/bulbs & [illegible]62 +4.97 (FY 19-20)= 17.59 Crs for Led street lanterns of various watts) against Grant of (Rs. 7.38+18.57 FY 2019-20) Rs.25.95 Crs received from MCGM.

& Includes expenditure incurred towards procurement of Furniture & office equipments of Rs. 28.47 Crs +1.96 Crs. (21-22) = 30.43 Crs under I T M S project against Grant of Rs. 07.37 Crs received from MCGM.

Cr.Amount of Rs. -184789.00 of Skill Development Traffic Taining Centre at Dindoshi inadvertently bookd in FY 2019-20, now reverted.

APPENDIX NO. E-6 (Contd.)

FIXED CAPITAL EXPENDITURE AS AT 31ST MARCH, 2023

* Includes Rs. 15,35,690.01/- not covered by Current Budget Grant but awaiting Corporation sanction.

** Includes Unremunerative Capital Expenditure amounting to Rs.71,81,75,203.46 on Staff Quarters .

*** In addition to the above mentioned Fixed Assets owned & in the possession of the B. E. S. T. Undertaking as on 31-3-2022, some more Fixed Assets, which are not owned but are in possession of B.E.S.& T. Undertaking by way of Lease Agreement, detailed as under:

Sr. No.	NATURE OF FIXED ASSETS	NATURE OF AGREEMENT	COST OF LEASED/SERVICED CONTRACT ASSETS	TOTAL COST Of LEASE RENT	RENTAL PAID UP TO 31.03.2022	BALANCE as on 31.03.2022	TENURE OF AGREEMENT (YEARS)
1	2500 Nos. Electronic Meters Acquired in 1999-2000	Lease	30715425	43837448	43837448	0.00	7

APPENDIX **E 7**

SCHEDULE OF GENERAL INVESTMENTS AS AT 31ST MARCH, 2023

Sr.No.	Comp. No.	Name	Face Value	Purchase Rate per cent	Book Value	Market rate percent	Market Value
1	1	8.20% Oil Bonds 2023	3,24,00,000.00	99.63	3,24,00,000.00		3,24,00,000.00
2	2	8.83% IRFC 2034	3,50,00,000.00	101.12	3,50,00,000.00		3,50,00,000.00
3	3	9.97% Andhra Pradesh Power Finance Corpn.Ltd.	1,10,00,000.00	101.45	1,10,00,000.00		1,10,00,000.00
4	4	9.97% Andhra Pradesh Power Finance Corpn.Ltd.	2,30,00,000.00	107.70	2,30,00,000.00		2,30,00,000.00
		Total	10,14,00,000.00		10,14,00,000.00		10,14,00,000.00

Note:- **The above Investments are transferred from Electricity Supply Contiengency Reserve Fund Investment.**

APPENDIX NO. E-8

SOURCES AND APPLICATION OF FUNDS FOR THE YEAR ENDED 31ST MARCH 2023.

(Rs. In Crores.)

Source of Fund	(As at 31st March, 2022)	(As at 31st March, 2023)
SOURCES OF FUNDS		
Funds	1096.52	1131.21
Other Dedicated Fund	280.91	289.17
Loan	1906.92	2562.09
Total	**3284.35**	**3982.47**
APPLICATION OF FUNDS		
Fixed Assets		
Gross Block	3832.89	3973.25
Less : Depreciation	-1887.11	-1962.12
Net Block	1945.78	2011.13
Capital work in Progress	37.47	44.14
Total	**1983.25**	**2055.27**
A. Investments	**79.67**	**92.60**
B. Current Assets		
Inventories	20.46	22.23
Sundry Debtors	698.92	685.09
Cash and Bank Balances	418.93	647.69
Other Current Assets	80.18	80.74
Total	**1218.49**	**1435.75**
C. Loans and Advances	314.66	436.50
Total A+B+C	**1612.82**	**1964.85**
Less : Current Liabilities and Provisions		
Liabilities	3359.30	4037.16
Provisions	0.12	0.21
TOTAL	**3359.42**	**4037.37**
Net Current Assets	**-1746.60**	**-2072.52**
Profit and Loss Account	**3047.70**	**3999.73**
TOTAL	**3284.35**	**3982.47**

APPENDIX E-9

MOVEMENT IN INTERNAL AND SPECIAL FUNDS AND PROVISIONS FOR THE YEAR 2022-2023

Particulars	Balance as on 1st Apr.2022	Provided during the Year	Amount Credited	Total	Amount Debited	Balance as on 31st Mar.2023
1	2	3	4	5	6	7
	₹	₹	₹	₹	₹	₹
Revenue Reserve Fund (101)	0	0	0	0	0	0
BEST Betterment Fund (Sec 460 LL(i)(b))(102)	0	0	0	0	0	0
Welfare Fund (Section 120 A)(103)	30000	0		30000	0	30000
Property Insurance Fund(104)	1873618672	6227487	0	1879846159	118894	1879727265
Third Party Insurance Fund(105)	0	131994603	0	131994603	131994603	0
Motor Vehicles (Third Party Insurance Fund)(106)	314134	0	0	314134	1021575	-707441
Electric Supply Contingencies Reserve Fund(107)	689709729	76154695		765864424		765864424
Fidelity Insurance Fund(108)	2999999	0		2999999		2999999
BEST Staff Benefit Fund (SEC 460 H. H.)(109+110)	154392235	0	8436022	162828257	1283548	161544709
General Fund(111)	0			0		0
Special Depreciation Fund(112)	0			0		0
Generation of Electricity Fund(114)	1968730105			1968730105		1968730105
B. E. S. T. Staff Amenities Fund(421)	0		73012020	73012020	73012020	0
Provision for Depreciation Fund(423)	18871138875	1173811503	780485	20045730863	* 424322948 250368	19621157547
Provision for Obsolescence of Stores(424)	935411	1910000		2845411		2845411
Return on Equity	0			0		0
Passenger Insurance Fund (117)	25200000			25200000		25200000
Best Group Insurance Fund(118)	-3819323		724	-3818599	602000	-4420599
TOTAL	23583249837	1390098288	82229251	25055577376	632605956	24422971420
GRANT FROM STATE/CENTRAL GOVT.,(115)	9063344931		** 5544536566	14711393570	5307206766	9404186804
CAPITAL CONNECTION FEES			@ 103512073			
GRAND TOTAL	32646594768	1390098288	5730277890	39766970946	5939812722	33827158224

* ASSETS WRITTEN OFF	
** GRANT RECEIVED	
FAME 2	2958800000
15TH FINANCE COMMISSION	2293836566
RDSS GRANT RECV FROM GOV OF INDIA	291900000
TOTAL	5544536566
@ CAPITAL CONNECTION FEE	103512073
TOTAL	5648048639

0

APPEENDIX NO. **E 10**

SCHEDULE OF ELECTRIC SUPPLY CONTINGENCIES RESERVE FUND INVESTMENTS AS AT 31ST MARCH, 2023

Sr. No.	Comp. No.	Name	Date of Invt.	Face Value	Book Value	Purchase rate percent	Int.Rate	Date of Maturity	Last date of Int.Recd.	Period	Market rate percent	Market Value
1	1	8.20% Oil Bonds 2023	03.12.09	3,24,00,000.00	3,24,00,000.00	99.63	8.20	10.11.2023	10.11.2020	142		3,24,00,000.00
2	2	8.83% IRFC 2034	06.10.10	3,50,00,000.00	3,50,00,000.00	101.12	8.83	14.05.2034	15.10.2020	168		3,50,00,000.00
3	3	9.97% Andhra Pradesh Power Finance Corpn.Ltd.	23.02.12	1,10,00,000.00	1,10,00,000.00	101.45	9.97	30.01.2024	01.10.2020	182		1,10,00,000.00
4	4	9.97% Andhra Pradesh Power Finance Corpn.Ltd.	23.02.12	2,30,00,000.00	2,30,00,000.00	101.70	9.97	30.01.2024	01.10.2020	182		2,30,00,000.00
5	8	10.03% Rajasthan SDL Spl. 2022	30.10.15	1,00,00,000.00	1,00,00,000.00	112.18	8.55	18.10.2022	18.10.2020	165		1,00,00,000.00
6	10	8.21% Haryana SDL Spl 2026	30.11.16	5,00,00,000.00	5,00,00,000.00	102.60	8.21	31.03.2026	31.03.2021	1		5,00,00,000.00
7	11	8.19% Rajasthan SDL Spl. 2026	30.11.16	50,00,000.00	50,00,000.00	108.05	8.19	23.06.2026	23.12.2022	99		50,00,000.00
8	12	7.73% WB SDL 2032	17.11.17	6,00,00,000.00	6,00,00,000.00	100.18	7.73	11.08.2032	08.11.2020	144		6,00,00,000.00
9	13	8.45% Assam SDL 2029	29.03.19	4,60,00,000.00	4,60,00,000.00	102.48	8.45	03.06.2029	06.03.2021	26		4,60,00,000.00
10	14	8.84% Rajasthan SDL 2028	29.03.19	1,00,00,000.00	1,00,00,000.00	105.05	8.84	09.12.2028	12.03.2021	20		1,00,00,000.00
11	15	8.18% Haryana Uday 2025	20.01.20	2,60,00,000.00	2,60,00,000.00	104.15	8.18	15.03.2025	15.12.2020	107		2,60,00,000.00
12	16	8.20% Haryana SDL 2028	20.01.20	3,60,00,000.00	3,60,00,000.00	105.80	8.20	02.07.2028	07.02.2021	53		3,60,00,000.00
13	17	10.03% Rajasthan SDL Spl. 18.10.2028	31.03.21	3,30,00,000.00	3,30,00,000.00	118.54	10.03	18.10.2026	18.10.2022	165		3,30,00,000.00
14	18	6.91% Maharashtra SDL 2033	29.10.21	1,20,00,000.00	1,20,00,000.00	99.35	6.91	15.09.2033	15.03.2023	17		1,20,00,000.00
15	19	8.30 % GOI 2042	01.12.21	10,00,000.00	10,00,000.00	114.94	8.30	31.12.2042	31.12.2022	91		10,00,000.00
16	20	7.14% Kerala SDL 2035	31.12.21	7,12,00,000.00	7,12,00,000.00	100.20	7.14	29.12.2035	29.12.2022	93		7,12,00,000.00
17	21	7.83% Rajasthan SDL 2032	28.06.22	5,00,00,000.00	5,00,00,000.00	100.00	7.83	22.06.2032	22.12.2022	100		5,00,00,000.00
18	22	7.79% Tamil Nadu SDL 2032	20.10.22	7,40,00,000.00	7,40,00,000.00	100.00	7.79	04.10.2032	04.10.2022	179		7,40,00,000.00
19	23	7.87 Himachal Pradesh SDL 2032	30.11.22	5,00,00,000.00	5,00,00,000.00	100.00	7.87	09.11.2035	09.11.2022	143		5,00,00,000.00
				63,56,00,000.00	63,56,00,000.00							63,56,00,000.00

APPENDIX NO E:11

Cash Flow Statement for the Year Ended 31 March, 2023

(₹ In Crores)

Particulars	For the year ended 31-03-2022	For the year ended 31-03-2023
A) Cash Flow from operating activities :		
Difference in Net Profit /(Loss) - Cumulative	(843.54)	(952.02)
(Profit) / Loss on sale of Fixed Assets	-	-
Depreciation	39.13	75.00
Contingencies Reserve Fund	7.36	7.62
Miscellaneous Expenditure Written off	0.00	0.00
Interest Expenses	0.00	0.00
Other provision (propins, sb fund , ge, best group insu)	0.64	1.27
Non Operating Income	0.00	0.00
Operating Profit/(Loss) before working capital changes	(796.41)	(868.14)
A)Adjustments for changes in Working Capital:		
Adjustments for application Fund	0.00	0.00
Decrease / (Increase) in Stores & Spares	1.67	(1.77)
Decrease / (Increase) in Sundry Debtors	(109.44)	13.83
Decrease / (Increase) in other Current Assets	(0.02)	(0.56)
Decrease / (Increase) in Loans and Advances	(17.28)	(121.85)
Increase / (Decrease) in Current Liabilities, Deposits and Provisions	48.93	677.95
Cash flow from Operations **(I)**	(872.55)	(300.54)
B) Cash flow from investing activities		
Net cash flow from Purchase / sale of Fixed Assests	(34.88)	(140.36)
Net (Increase)/Decrease in Investments	(2.85)	(12.93)
Non Operating Income	0.00	0.00
Net (Increase)/Decrease in Capital work in progress	(6.50)	(6.67)
Net cash flow from investing activities **(II)**	(44.23)	(159.96)
C) Cash flow from financing activities		
Government Grant / Consumer Contribution received	41.58	34.08
Net increase/(Decrease) in Long Term Loans	1053.49	655.17
Interest Expenses	0.00	0.00
Internal Reserve Difference	0.00	0.00
Net cash flow from financing activities **(III)**	1095.07	689.25
Net Cash Inflow/(Outflow) (I)+(II)+(III)	178.28	228.75
Cash and Bank equivalents at beginning of the period	240.66	418.94
Cash and Bank equivalents at closing of the period	418.94	647.69

* Revised as per the MCA Report on Annual Accounts of F.Y. 2013-14 under para No. 4.

APPENDIX NO. E-12

ABSTRACT OF RECEIPTS AND EXPENDITURE FOR THE YEAR ENDED 31ST MARCH,2023.

RECEIPTS	₹	DISBURSEMENTS	₹
Balance as on 01-04-2022	1,57,92,58,920		
A: **Revenue Accounts**		A: **Revenue Accounts**	
Administration		General Administration	2,37,48,95,471
		Electric Supply	46,96,10,27,619
Miscellaneous Receipts	74,05,30,779	Buses	28,77,52,71,487
Electric Supply			
Distribution of Electric Energy	35,29,54,27,804	Statutory Transfer to Municipal & Other Funds	-
Street Lighting	72,36,11,048		
E. D. Collecting charges, delay payment charges etc.	39,15,86,840	Minimum Cash Balance as per Section 460kk(1)	-
Other Receipts	15,23,69,550		
		B: **Capital Account**	
BUSES			
		General Administration	37,79,21,185
Traffic Receipts	29,04,35,22,445	Electric Supply	1,42,58,85,236
Other Receipts	1,00,55,92,765	Buses	7,63,46,967
B: **Capital Account**		Loan Funds	8,72,06,55,664
		Other Items	(47,65,40,388)
Loan Funds - Debts Principal	11,28,76,92,205		
C: **Other Accounts**		C: **Other Accounts**	
1) Sinking Fund	-	1) Sinking Fund	-
2) Special & Internal Funds	48,16,36,242	2) Special and Internal Funds	46,99,98,026
3) Sinking, Special & Internal Funds Investments (Paper & Cash)	19,71,20,000	3) Sinking,Special & Internal Funds Investments (Paper & Cash)	32,71,20,000
4) Suspense Accounts		4) Suspense Accounts	
I) Deposits	7,25,31,63,421	i) Deposits	14,36,35,678
ii) Stores Accounts Purchases	6,11,85,83,865	ii) Stores Accounts Purchases	5,64,75,40,001
iii) Miscellaneous	2,71,37,30,28,933	iii) Miscellaneous	2,67,40,36,45,289
		Balance as on 31-03-2023	3,41,57,22,583
GRAND TOTAL	**3,65,64,31,24,819**	**GRAND TOTAL**	**3,65,64,31,24,819**

I Signed, subject to my Audit Report U/No.MCA/025/22-23/06 dtd.28/12/2023 on the 2022-23 Accounts of B.E.S. & T. Undertaking & Certificate No. MCA/025/22-23/05 dtd. 28/12/2023 contained therein.

M.C.A. BMC DEPARTMENT

22/12/23

CAO & FA | 22/12/2023 Dy.C.M.(A) | Municipal Chief Auditor | General Manager

APPENDIX NO. E-13

STATEMENT OF SHORT TERM FINANCIAL ASSISTANCE FOR THE F.Y. 2022-23 (IN CRORES)

Sr.NO.	BANK NAME	INT. Rate	Sanction Amount	Loan Period		O/S As on 31.03.2022	S.T.F.A. Raised	S.T.F.A. Repaid	O/S As on 31.03.2023
(A)	SHORT TERM LOANS			From	To				
1	BANK OF INDIA	6.85%	200.00	31.03.2022	31.03.2023	200.00	0.00	200.00	0.00
		7.55%	200.00	30.06.2022	26.06.2023	0.00	200.00	200.00	0.00
		7.55%	50.00	11.08.2022	30.06.2023	0.00	50.00	50.00	0.00
2	HDFC BANK	7.51%	100.00	31.12.2022	30.12.2023	0.00	100.00	25.00	75.00
3	RURAL ELECTRIFICATION CORPORATION LTD.	8.10%	100.00	25.05.2021	15.05.2022	16.67	0.00	16.67	0.00
	SHORT TERM LOAN TOTAL - (A)					216.67	350.00	491.67	75.00

* RATE OF INTEREST FOR THE MONTH MARCH- 2022 IS SHOWN AS INTEREST RATES ARE FLUCTUATED DURING THE FINANCIAL YEAR.

THE BRIHAN MUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING

(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

APPENDIX NO. E-1

Annexure 4

GENERAL FINANCIAL STATISTICS 2023-2024

2022-2023 ₹	PARTICULARS	₹	2023-24 ₹
	ELECTRIC SUPPLY INCOME		
35,29,54,27,804	Distribution of Energy by Meter	41,85,14,47,703	
8,75,38,710	Street Lighting sale of Energy	11,21,68,428	
63,60,72,339	Street Lighting -R.&M	69,71,85,338	
54,39,56,390	Other Receipts	55,37,60,171	
33,46,30,315	Share of General Admn. Receipts	21,36,17,913	
36,89,76,25,558	Total		43,42,81,79,553
	ELECTRIC SUPPLY EXPENDITURE		
28,60,96,49,735	Cost of Energy Purchased	23,93,68,55,673	
5,61,29,99,091	External Power Purchased	4,45,05,80,615	
2,54,20,00,131	Intra State Transmission Charges	2,33,63,69,787	
98,53,00,008	Standby Charges	94,02,99,996	31,66,41,06,071
37,74,99,48,965			
5,28,42,85,552	Establishment Cost		5,24,38,61,648
53,50,58,534	Admn.and Gen.Expenses		52,53,69,534
65,43,30,533	Repairs and Maintenance		1,00,25,70,055
55,06,08,620	Other Cost (includes Cont. Res. Fund & Interest on Consumer Deposit)		84,61,22,715
1,07,72,35,346	Depreciation		1,08,77,87,569
91,61,58,592	Share of Gen. Admn.		87,73,43,468
1,10,95,60,068	Interest on Loans		1,49,50,97,507
47,87,71,86,210	TOTAL		42,74,22,58,567
-10,97,95,60,652	SURPLUS / DEFICIT		68,59,20,986

2022-2023 ₹	PARTICULARS	₹	2023-24 ₹
1,00,000	Minimum Cash balance B/F		1,00,000
	Excess of Expenditure over Income		
-10,97,95,60,652	Supply	0	
0	Buses	-10,37,93,31,414	
	Excess of Income over Expenditure		
0	Supply	68,59,20,986	
22,10,07,307	Buses		-9,69,34,10,428
-10,75,84,53,345	Total		-9,69,33,10,428
1,00,000	Minimum Cash Balance required under section 460KK (1) C/F		1,00,000
-10,75,85,53,345			-9,69,34,10,428
	Balance appropriated as under:-		
0	Transferred to Municipal Fund under section 460KK 2 (e)		0
0	Transferred to Generation of Electricity Fund		0
-10,75,85,53,345			-9,69,34,10,428
	Previous Year Accum. Surplus/Deficit		
49,29,37,63,363	Supply	38,65,45,76,685	
-79,77,07,28,876	Buses	-78,65,18,56,157	-39,99,72,79,472
-30,47,69,65,513	ACCUMULATED DEFICIT		
1,23,82,39,386	Prior Period Adjustment (CR)		55,75,19,128
-39,99,72,79,472	Balance C/F To Balancesheet		-49,13,31,70,772

Contd...

APPENDIX E-1 Contd....

2022-2023	PARTICULARS		2023-24	2022-2023	PARTICULARS		2023-24
₹		₹	₹	₹		₹	₹
	BUSES INCOME						
29,04,35,22,445	Passenger Receipts	19,98,35,07,331					
1,00,55,92,765	Other Receipts	1,29,04,62,525					
40,59,00,464	Share of Gen. Admn. Receipts	18,35,24,247					
30,45,50,15,674	Total		21,45,74,94,103				
	BUSES EXPENDITURE						
9,91,22,38,802	Fuel and Operating Materials		11,50,32,62,416				
17,40,99,44,242	Establishment Cost		17,43,43,09,298				
55,39,61,347	Admn.and Gen.Expenses		53,74,04,114				
50,32,76,968	Repairs and Maintenance		45,11,40,143				
5,68,14,715	Other Cost		4,48,58,330				
6,51,34,913	Depreciation		7,17,00,996				
27,39,00,500	Interest on Loans		34,97,97,425				
1,45,87,36,880	Share of Gen.Admn.		1,44,43,52,795				
30,23,40,08,367	TOTAL		31,83,68,25,517		TOTAL		
22,10,07,307	SURPLUS / DEFICIT		-10,37,93,31,414				

I Signed, subject to my Audit Report U/No.MCA/025/ 24-25/03 dtd. 27/09/2024 on the 2023-24 Accounts of B.E.S. & T. Undertaking & Certificate U/No. MCA/025/24-25/02 dtd. 27/09/2024 enclosed therein.

CAO & FA (Del.) Dy.C.M.(A) Municipal Chief Auditor General Manager

Municipal Chief Auditor

M.C.A. BMC DEPARTMENT

APPENDIX NO. E-2

DIVISIONAL INCOME AND EXPENDITURE STATEMENT FOR THE YEAR ENDED 31ST MARCH, 2024

ELECTRIC SUPPLY

2022-23	EXPENDITURE		2023-24	2022-23	INCOME		2023-24
₹		₹	₹	₹		₹	₹
28,60,96,49,735	Cost of Energy Purchased	23,93,68,55,673		35,29,54,27,804	Distribution of Energy by Meter		41,85,14,47,703
5,61,29,99,091	External Power Purchased	4,45,05,80,615					
2,54,20,00,131	Intra State Transmission Charges	2,33,63,69,787		8,75,38,710	Street Lighting Sale of Energy		11,21,68,428
98,53,00,008	Standby Charges	94,02,99,996	31,66,41,06,071				
37,74,99,48,965				63,60,72,339	Street lighting -R & M		69,71,85,338
				36,01,90,38,853			42,66,08,01,469
5,28,42,85,552	Establishment Cost (Supply)		5,24,38,61,648		**Other Receipts**		
63,58,94,308	Establishment Cost (Gen.Admn.)		57,35,46,035	0	Electricity Duty Collection	0	0
				14,03,90,442	Delayed payment Charges	16,06,57,945	
53,50,58,534	Admn.and Gen.Expenses (Supply)		52,53,69,534	1,92,83,247	Rent of Land & Building	1,85,39,048	
12,39,51,532	Admn.and Gen.Expenses (Gen.Admn.)		13,18,22,061	2,37,60,000	Advertisement	7,28,58,956	
				36,05,22,701	Miscellaneous	30,17,04,223	55,37,60,172
65,43,30,533	Repairs and Maintenance (Supply)		1,00,25,70,055	54,39,56,390			
9,17,24,973	Repairs and Maintenance (Gen.Admn.)		7,83,36,536				
47,44,53,926	Other Cost (Supply)		76,63,08,553				
4,89,41,468	Other Cost (Gen.Admn.)		5,09,93,015				
1,07,72,35,346	Depreciation (Supply)		1,08,77,87,569	33,46,30,315	Share of General Administration Receipts		21,36,17,913
1,56,46,311	Depreciation (Gen.Admn.)		4,26,45,821				
1,10,95,60,067	Interest on Loans (Supply)		1,49,50,97,507				
0	Interest on Loans (Gen.Admn.)		0				
7,61,54,695	Provisions towards Electric Supply Contingencies Reserve Fund		7,98,14,163				
47,87,71,86,210	**TOTAL**	**	42,74,22,58,568	36,89,76,25,558	**TOTAL**		43,42,81,79,554
	Surplus Transferred to Appropriation A/C		68,59,20,986	-10,97,95,60,652	Deficit Transferred to Appropriation A/C		
47,87,71,86,210	**TOTAL**		**43,42,81,79,554**	**47,87,71,86,210**	**TOTAL**		**43,42,81,79,554**

** The total expenditures Includes 1,53,79,88,528.07/- not covered by Current Budget Grant but awaiting Corporation's Sanction.

APPENDIX NO. E-3

DIVISIONAL INCOME & EXPENDITURE STATEMENT FOR THE YEAR ENDED 31ST MARCH, 2024.

BUSES

2022-23	EXPENDITURE		2023-24	2022-23	INCOME		2023-24
₹		₹	₹	₹		₹	₹
	Fuel and Operating Materials				**Traffic Earning From**		
2,75,85,45,574	C.N.G.Fuel	2,08,28,49,912		4,88,37,97,879	Sale of Tickets	3,94,82,27,202	
51,42,29,856	Fuel Oil	50,70,25,621		2,27,00,04,977	Sale of Tickets wet-lease Buses	3,01,81,04,265	
0	Electricity for Electric Buses	0					
3,61,44,918	Lubricants	3,17,06,261		43,86,436	Monthly Bus Passes	86,48,374	
7,58,81,286	Tyre and Tubes	6,64,85,261		81,53,226	Reserved Buses	68,44,879	
27,26,31,507	Tickets	22,30,61,859		0	Lump sum payment from Govt.	0	
6,25,48,05,661	Hiring Chgs. For Buses (wet-lease)	8,59,21,33,501	11,50,32,62,415	5,43,79,927	towards free travel by police personnel	16,82,611	6,98,35,07,331
9,91,22,38,802				7,22,07,22,445			
17,40,99,44,242	Establishment Cost (Buses)		17,43,43,09,298				
1,13,74,42,390	Establishment Cost (Gen.Admn.)		1,10,40,98,472	35,07,95,482	Advertisement Receipts	45,83,06,456	
55,39,61,347	Admn.and Gen.Expenses (Buses)		53,74,04,114	21,82,28,00,000	Grant from MCGM	13,00,00,00,000	
12,85,04,945	Admn.and Gen.Expenses (Gen.Admn.)		14,09,36,197				
				0	Grant from other than MCGM	0	
				50,96,76,553	Other Receipts	50,95,94,483	
50,32,76,968	Repairs and Maintenance (Buses)		45,11,40,144				
9,68,95,234	Repairs and Maintenance (Gen.Admn.)		8,46,63,916	2,66,96,684	Engineering Receipts	5,37,74,507	
5,68,14,715	Other Cost (Buses)		4,48,58,330	11,84,24,046	Rent of Bldg.and Land	26,87,87,079	14,29,04,62,525
8,02,48,000	Other Cost (Gen.Admn.)		7,20,08,388	22,82,83,92,765			
				40,59,00,464	Share of Gen.Admn. Receipts		18,35,24,247
6,51,34,913	Depreciation (Buses)		7,17,00,996				
1,56,46,311	Depreciation (Gen.Admn.)		4,26,45,822				
27,39,00,500	Interest on Loans (Buses)		34,97,97,425				
0	Interest on Loans (Gen.Admn.)		0				
30,23,40,08,367				30,45,50,15,674	**Total**		21,45,74,94,103
22,10,07,307	Surplus Transferred to Appropriation A/c.				Deficit Transferred to Appropriation A/c.		10,37,93,31,414
30,45,50,15,674	**Total**	**	**31,83,68,25,517**	**30,45,50,15,674**	**Total**		**31,83,68,25,517**

** The total Expenditure Includes 1,51,11,97,268.56/-not covered by Current Budget Grant but awaiting Corporation's Sanction.

APPENDIX NO. E-4

APPROPRIATION ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2024

PARTICULARS		2022-23 ₹	2023-2024 ₹
MINIMUM CASH BALANCE B/F - SUPPLY		50,000	50,000
BUSES		50,000	50,000
ELECTRIC SUPPLY :--- SURPLUS / DEFICIT(APPENDIX E-2)		-10,97,95,60,652	68,59,20,986
BUSES :--- SURPLUS / DEFICIT (APPENDIX E-3)		22,10,07,307	-10,37,93,31,414
TOTAL		**-10,75,84,53,345**	**-9,69,33,10,428**
SUPPLY		-10,97,95,10,652	68,59,70,986
BUSES		22,10,57,307	-10,37,92,81,414
LESS--- TRANSFERRED TO MUNICIPAL FUND UNDER SEC 460 KK (2) (e)			
SUPPLY		0	0
BUSES		0	0
LESS---MINIMUM CASH BALANCE REQUIRED UNDER SECTION 460 KK (1) C/F			
SUPPLY		50,000	50,000
BUSES		50,000	50,000
LESS---TRANSFERRED TO GENERATION OF ELECTRICITY FUND		0	0
TOTAL **SUPPLY**		**-10,97,95,60,652**	**68,59,20,986**
BUSES		**22,10,07,307**	**-10,37,93,31,414**
PREVIOUS YEAR ACCUMULATED SURPLUS / DEFICIT			
SUPPLY		49,29,37,63,363	38,65,45,76,685
BUSES		-79,77,07,28,876	-78,65,18,56,157
ACCUMULATED SURPLUS / DEFICIT			
SUPPLY		38,31,42,02,711	39,34,04,97,671
BUSES		-79,54,97,21,569	-89,03,11,87,571
PRIOR PERIOD ADJUSTMENT (NET)			
SUPPLY		CR 34,03,73,974	CR 40,65,62,254
BUSES		CR 89,78,65,412	CR 15,09,56,874
BALANCE SURPLUS /DEFICIT CARRIED FORWARD		**-39,99,72,79,472**	**-49,13,31,70,772**
SUPPLY		**38,65,45,76,685**	** **39,74,70,59,925**
BUSES		**-78,65,18,56,157**	**-88,88,02,30,697**

I Signed, subject to my Audit Report U/No.MCA/025/ 24-25/03 dtd. 27/09/2024 in the 2023-24 Accounts of B.E.S. & T. Undertaking & Certificate U/No. MCA/025/24-25/02 dtd. 27/09/2024 enclosed the

CAO & FA (Del.) Dy.M.(A) Municipal Chief Auditor General Manager

Municipal Chief Auditor

M.C.A. BMC DEPARTMENT

ANNEXURE :- 'A'

ALLOCATION OF GENERAL ADMINISTRATION INCOME FOR THE YEAR ENDED 31ST MARCH, 2024.

AMOUNT 2022-2023	ALLOCATION		PARTICULARS	AMOUNT 2023-2024	ALLOCATION	
	ELE. SUPPLY	BUSES			ELE. SUPPLY	BUSES
₹	₹	₹		₹	₹	₹
61,55,301	55,39,770	6,15,530	A) Interest on Deposits & Other Investments	75,44,336	67,89,903	7,54,434
			B) MISCELLANEOUS:			
38,52,414	19,26,207	19,26,207	1) Apprentices Premium etc.	18,94,301	9,47,151	9,47,151
17,44,48,394	4,36,12,099	13,08,36,296	2) Rent of Buildings & Land	8,55,72,071	2,13,93,018	6,41,79,053
11,02,98,079	6,06,63,943	4,96,34,136	3) Sale of Stores & Scrap Material etc. (Net)	17,59,05,873	12,13,75,052	5,45,30,821
44,57,16,592	22,28,58,296	22,28,58,296	4) Other Receipts	12,62,25,579	6,31,12,789	6,31,12,789
60,000	30,000	30,000	5) Advertisement Receipts			-
74,05,30,779	**33,46,30,315**	**40,59,00,464**	**TOTAL**	**39,71,42,160**	**21,36,17,913**	**18,35,24,247**

ANNEXURE :-B

ALLOCATION OF GENERAL ADMINISTRATION EXPENDITURE FOR THE YEAR 2023-2024

AMOUNT 2022-2023	SUPPLY 2022-2023	BUSES 2022-2023	PARTICULARS	AMOUNT 2023-2024	SUPPLY 2023-2024	BUSES 2023-2024
₹	₹	₹		₹	₹	₹
			ESTABLISHMENT COST			
7,16,58,646	3,58,29,323	3,58,29,323	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	7,87,84,511	3,93,92,256	3,93,92,256
14,20,96,659	7,10,48,329	7,10,48,329	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	14,25,07,225	7,12,53,613	7,12,53,613
1,69,22,602	84,61,301	84,61,301	PUBLIC RELATION DEPARTMENT	1,08,34,290	54,17,145	54,17,145
2,39,89,965	1,19,94,982	1,19,94,982	LEGAL DEPARTMENT	2,80,15,994	1,40,07,997	1,40,07,997
11,31,98,533	5,65,99,266	5,65,99,266	INTERNAL AUDIT	11,00,54,944	5,50,27,472	5,50,27,472
7,70,00,128	3,85,00,064	3,85,00,064	MATERIAL MANAGEMENT	8,17,47,307	4,08,73,654	4,08,73,654
63,87,77,739	15,96,94,435	47,90,83,304	SECURITY AND VIGILANCE	55,35,24,367	11,07,04,873	44,28,19,493
19,82,12,495	8,91,95,623	10,90,16,872	CHIEF ENGINEER CIVIL & DRAWING OFFICE	16,69,86,436	7,51,43,896	9,18,42,540
11,38,42,894	2,16,30,150	9,22,12,744	TIME KEEPING	11,64,69,003	2,21,29,111	9,43,39,892
4,59,27,662	87,26,256	3,72,01,406	PERSONNEL	6,09,83,906	1,15,86,942	4,93,96,964
4,52,86,708	86,04,475	3,66,82,234	WELFARE	4,74,62,837	90,17,939	3,84,44,898
12,71,22,891	2,41,53,349	10,29,69,541	MEDICAL	13,73,62,519	2,60,98,879	11,12,63,641
14,53,79,109	9,44,96,421	5,08,82,688	INFORMATION TECHNOLOGY DEPARTMENT	14,29,11,167	9,28,92,259	5,00,18,909
1,39,20,669	69,60,335	69,60,335	GENERAL ADMINISTRATION	-	-	-
		-				
1773336698	**635894308**	**1137442390**	**TOTAL ESTABLISHMENT COST**	**1,67,76,44,507**	**57,35,46,035**	**1,10,40,98,472**
			ADMINISTRATION & GENERAL EXPENSES			
37,33,423	18,66,712	18,66,712	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	32,63,430	16,31,715	16,31,715
43,04,671	21,52,336	21,52,335	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	39,11,261	19,55,630	19,55,630
9,69,779	4,84,889	4,84,889	PUBLIC RELATION DEPARTMENT	7,08,773	3,54,387	3,54,387
49,90,379	24,95,190	24,95,190	LEGAL DEPARTMENT	21,56,151	10,78,076	10,78,076
3,81,947	1,90,974	1,90,974	INTERNAL AUDIT	23,69,505	11,84,753	11,84,753
1,09,24,913	54,62,456	54,62,456	MATERIAL MANAGEMENT	1,41,67,015	70,83,507	70,83,507
37,98,311	9,49,578	28,48,733	SECURITY AND VIGILANCE	48,53,169	9,70,634	38,82,535
1,07,91,267	48,56,070	59,35,197	CHIEF ENGINEER CIVIL & DRAWING OFFICE	1,64,36,259	73,96,317	90,39,942
2,11,294	40,146	1,71,148	TIME KEEPING	6,57,388	1,24,904	5,32,484
25,98,622	4,93,738	21,04,884	PERSONNEL	35,75,372	6,79,321	28,96,051
12,41,865	2,35,954	10,05,911	WELFARE	13,20,834	2,50,958	10,69,876
61,84,648	11,75,083	50,09,565	MEDICAL	69,84,689	13,27,091	56,57,598
48,80,889	31,72,578	17,08,311	INFORMATION TECHNOLOGY DEPARTMENT	75,99,749	49,39,837	26,59,912
19,74,44,469	10,03,75,829	9,70,68,640	GENERAL ADMINISTRATION	20,47,54,662	10,28,44,932	10,19,09,731
252456478	**123951532**	**128504946**	**TOTAL ADMINISTRATION & GENERAL EXPENSES**	**27,27,58,258**	**13,18,22,061**	**14,09,36,197**

Contd...

AMOUNT 2022-2023	SUPPLY 2022-2023	BUSES 2022-2023	PARTICULARS	AMOUNT 2023-2024	SUPPLY 2023-2024	BUSES 2023-2024
₹	₹	₹		₹	₹	₹
			REPAIRS & MAINTENANCE			
3,38,105	1,69,052	1,69,052	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	4,21,854	2,10,927	2,10,927
8,05,721	4,02,861	4,02,861	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	7,31,041	3,65,521	3,65,521
39,105	19,552	19,552	PUBLIC RELATION DEPARTMENT	35,226	17,613	17,613
1,04,585	52,292	52,292	LEGAL DEPARTMENT	1,78,711	89,356	89,356
3,15,994	1,57,997	1,57,997	INTERNAL AUDIT	3,12,827	1,56,414	1,56,414
8,50,421	4,25,210	4,25,210	MATERIAL MANAGEMENT	3,96,439	1,98,219	1,98,219
13,35,361	3,33,840	10,01,521	SECURITY AND VIGILANCE	12,75,868	2,55,174	10,20,694
4,55,03,030	2,04,76,364	2,50,26,667	CHIEF ENGINEER CIVIL & DRAWING OFFICE	5,39,40,004	2,42,73,002	2,96,67,002
3,58,287	68,075	2,90,213	TIME KEEPING	1,58,474	30,110	1,28,364
1,73,073	32,884	1,40,189	PERSONNEL	3,05,686	58,080	2,47,605
1,03,065	19,582	83,483	WELFARE	60,604	11,515	49,089
2,76,805	52,593	2,24,212	MEDICAL	3,23,557	61,476	2,62,081
20,42,283	13,27,484	7,14,799	INFORMATION TECHNOLOGY DEPARTMENT	11,93,666	7,75,883	4,17,783
13,63,74,371	6,81,87,185	6,81,87,185	GENERAL ADMINISTRATION	10,36,66,495	5,18,33,247	5,18,33,247
18,86,20,206	**9,17,24,972**	**96895234**	**TOTAL REPAIRS & MAINTENANCE**	**16,30,00,452**	**7,83,36,536**	**8,46,63,916**
			OTHER COST			
-	-	-	MANAGEMENT,SECY.TYPING,CORRESPONDENCE	-	-	-
-	-	-	ACCOUNTS,CAO & FA,BUDGET,PF,CASH	79,532	39,766	39,766
81,824	40,912	40,912	PUBLIC RELATION DEPARTMENT	-	-	-
-	-	-	LEGAL DEPARTMENT	-	-	-
20,000	10,000	10,000	INTERNAL AUDIT	-	-	-
-	-	-	MATERIAL MANAGEMENT	-	-	-
72,587	18,147	54,440	SECURITY AND VIGILANCE	93,186	18,637	74,549
6,415	2,887	3,528	CHIEF ENGINEER CIVIL & DRAWING OFFICE	4,720	2,124	2,596
-	-	-	TIME KEEPING	-	-	-
-	-	-	PERSONNEL	-	-	-
3,57,37,802	67,90,182	2,89,47,620	WELFARE	2,28,48,611	43,41,236	1,85,07,375
79,93,700	15,18,803	64,74,897	MEDICAL	61,98,062	11,77,632	50,20,431
-	-	-	INFORMATION TECHNOLOGY DEPARTMENT	4,777	3,105	1,672
8,52,77,139	4,05,60,537	4,47,16,603	GENERAL ADMINISTRATION	9,37,72,515	4,54,10,515	4,83,62,000
12,91,89,468	**48941468**	**80248000**	**TOTAL OTHER COST**	**12,30,01,404**	**5,09,93,015**	**7,20,08,388**
						-
3,12,92,622	1,56,46,311	1,56,46,311	**DEPRECIATION**	8,52,91,643	4,26,45,822	4,26,45,822
2374895473	**916158592**	**1458736881**	**TOTAL OF GENERAL ADMINISTRATION**	**2,32,16,96,263**	**87,73,43,468**	**1,44,43,52,795**

APPENDIX NO. E- 5

BALANCE SHEET AS AT 31ST MARCH, 2024

2022-23 ₹		LIABILITIES	₹	2023-24 ₹	2022-23 ₹		ASSETS	₹	2023-24 ₹
		FUNDS					NET FIXED ASSETS		
0	1)	Revenue Reserve Fund Section 460 LL (1) (a)		0	39,73,24,91,534	1)	Fixed Capital Expenditure (E-6)	39,84,86,06,699	
0	2)	BEST Betterment Fund Section 460LL (1) (b)		0	-19,62,11,57,547		Less : Accumulated Depreciation	-19,67,88,74,118	
30,000	3)	Welfare Fund Section 460 LL (1) (c)		30,000	44,14,06,352	2)	Capital Work - in - Progress *	47,44,72,586	
					20,55,27,40,339				20,64,42,05,167
1,87,97,27,265	4)	Property Insurance Fund		1,95,00,26,135			INVESTMENT		
30,00,000	5)	Fidelity Insurance Fund		30,00,000	10,14,00,000	1)	General Investment (E - 7)	3,50,00,000	
	6)	General Fund		0	2,00,00,000	2)	Generation of Electricity Fund Investment	2,00,00,000	
19,62,11,57,547	7)	Depreciation Fund	19,67,88,74,120		1,250	3)	Shares in Co-Op. Banks	1,250	
-19,62,11,57,547		Less - Provision	-19,67,88,74,118	2	15,30,00,000	4)	BEST Staff Benefit Fund Investment	16,25,00,000	
0					1,60,15,467	5)	Fixed & Call Deposits with Banks.	7,45,33,311	
2,52,00,000	8)	Passenger Insurance Fund		2,52,00,000	63,56,00,000	6)	Contingencies Reserve Fund Investment	64,72,00,000	
	9)	Financial Asst. Recd. from Various Sources			0	7)	BEST Group Insurance Scheme Fund		
9,00,87,74,731		(i) Financial Asst.from State/Central Govt.	7,38,63,58,969		92,60,16,717				93,92,34,561
0		(ii) Non-Refundable Premium	0				CURRENT ASSETS		
10,35,12,073		(iii) Capital Connection Fees	1,67,30,24,714		60,00,00,000	1)	Interest Free Deposit for Renewal Power Purch:	60,00,00,000	
29,19,00,000		(iv) RDSS Grant	58,38,00,000	9,64,31,83,683		2)	Interest Accrued on Fixed & Call		
11,31,21,44,069				11,62,14,39,820	20,71,00,588		Deposits and General Investment	20,90,16,111	
		Dedicated Fund			0	3)	Deferred Revenue Expenditure	0	
	1)	Electric Supply Contingencies Reserve Fund as per				4)	Securities Deposited by		
76,58,64,424		MERC from F. Y. 2008-09 onwards.	84,56,78,587		3,15,080		Employees,Consumers & Sundry Parties	3,15,080	
16,15,44,709	2)	Staff Benefit Fund	17,35,66,878		80,74,15,668				80,93,31,191
1,96,87,30,105	3)	Generation of Electricity Fund	1,96,87,30,105						
-44,20,599	4)	BEST Group Insurance Fund	829			5)	Stock in Hand ##		
2,89,17,18,639				2,98,79,76,399	22,23,16,191		(a) Revenue		17,77,43,898
		LOAN FROM							
2,37,19,06,319		LOAN FROM RURAL ELECTRIFICATION CORPN. LTD.	1,97,65,88,599		0	6)	Work in Progress for outside parties		
4,44,86,00,000		Temporary Advance From MCGM	4,44,86,00,000		6,85,09,24,416	7)	Book Debts		7,83,28,85,016
31,65,48,050		World Bank Loan under MUTP	27,13,26,900			8)	Cash and Bank Balance		
4,53,94,960		APDRP Loan	2,32,37,040		1,90,19,13,107		(a) Cash on Hand	51,50,57,756	
1,85,00,00,000		Working Capital Demand loan with Canara	2,05,00,00,000		4,57,49,43,174		(b) With Banks	3,28,98,13,806	
15,83,84,22,367		TATA Power Bill Discouting Facilities	13,82,93,26,199		500		(c) Investment in Treasury Bill	500	
75,00,00,001		Short Term Assistance from Financial Institutions	6,28,75,00,001						
25,62,08,71,697				28,88,65,78,739	6,47,68,56,781				3,80,48,72,062
39,82,47,34,405		TOTAL C/F		43,49,59,94,958	35,83,62,70,112		TOTAL C/F		34,20,82,71,895

Contd....

2022-23	LIABILITIES		2023-24	2022-23	ASSETS		2023-24
₹		₹	₹	₹		₹	₹
39,82,47,34,405	TOTAL B/F		43,49,59,94,958	35,83,62,70,112	TOTAL B/F		34,20,82,71,895
	CURRENT LIABILITES				8) LOANS AND ADVANCES		
	A:- DEPOSITS FROM			15,77,885	a) Due from Staff	8,30,798	
3,32,07,152	(1) Employees	3,26,43,572		38,73,945	b) On Account Payment	38,55,330	
5,31,37,15,395	(2) Consumers	5,65,98,39,449		3,59,49,276	c) Festival Advance	3,50,99,776	3,97,85,904
3,43,07,97,309	(3) Sundry Parties	3,63,05,81,605		72,30,70,885	d) Due from Suppliers	65,72,43,818	
3,15,080	(4) Govt. Securities	3,15,080		3,55,77,57,958	e) Due from Others	4,21,37,09,473	
8,77,80,34,936			9,32,33,79,706	4,28,01,421	f) Prepaid Expenses	3,90,77,880	
	B:- OTHER LIABILITIES FOR			504	g) Deposits with Suppliers	504	
				4,36,50,31,874			4,94,98,17,579
1,85,17,52,283	(1) Goods Supplied	1,50,81,46,921					
5,53,57,42,513	(2) Other Expenses	7,47,07,31,463			REVENUE ACCOUNTS		
4,57,88,31,992	(3) Other Finance	5,78,72,73,670		39,99,72,79,463	** Deficit As Per Revenue Accounts		49,13,31,70,762
0	(4) Unclaimed Interest	0					
0	(5) Accrued Interest	0					
19,62,72,47,350	(6) Third Parties	20,70,23,18,548					
31,59,35,74,138			35,46,84,70,602				
	PROVISION FOR						
0	(1) BEST Staff Amenities Fund	1,17,000					
28,45,411	(2) Obsolescences of Stores	47,55,411					
0	(3) Third Party Insurance Fund	0					
-7,07,441	(4) Motor Vehicle (Third Party Insurance Fund)	-15,57,441					
21,37,970			33,14,970				
	Minimum Cash Balance Required						
1,00,000	under Sec. 460KK(1)		1,00,000				
80,19,85,81,449	TOTAL		88,29,12,60,236	80,19,85,81,449	TOTAL		88,29,12,60,236

* Includes Capital Stock in hand amounting to ₹ 37,96,03,217 i.e Supply ₹ 36,54,74,942 & Buses ₹ 1,41,28,276.

₹ 47,44,72,585 Includes CAPITAL STOCK of ₹ 37,96,03,217 & CWIP ₹ 9,48,69,368.

₹17,75,27,020 REVENUE STOCK

₹ 65,19,99,605

₹55,71,30,237 BALANCE AS PER LEDGER A/c586

₹9,48,69,368 CWIP AS PER LEDGER A/C 551

I Signed, subject to my Audit Report U/No.MCA/025/ 24-25/03 dtd.27/09/2024 on the 2023-24 Accounts of B.E.S. & T. Undertaking & Certificate U/No. MCA/025/24-25/02 dtd. 27/09/2024 enclosed therein.

CAO & FA (Del.) Dy.M.(A) Municipal Chief Auditor General Manager

Municipal Chief Auditor

M.C.A. BMC DEPARTMENT

ANNEXURE :- 'C'

NOTES ON THE BALANCE-SHEET AS AT 31ST MARCH 2024.

1. Stores and Material except scrap are valued at cost, scrap is valued at average sale rates.

2. Amount receivable under Court Decree Award from M/s.Madison Communication Pvt. Ltd. ₹.13,15,31,438.

3. Contingent Liability :

Claims against the Undertaking not acknoweldged as debt ₹ 25,34,46,293/- (Previous year ₹16,71,53,653/-) .

APPENDIX NO. E-6

FIXED CAPITAL EXPENDITURE AS AT 31ST MARCH, 2024

PARTICULARS	TOTAL AS AT 31ST MAR,2023		ADDITIONS DURING FY 2023-24	DEDUCTION IN RESPECT OF ASSETS WRITTEN OFF	ADJUSTMENT IN RESPECT OF TRANSFER (+) OR (-)	TOTAL AS AT 31ST MARCH,2024	ACCUMULATED DEPRECIATION AS ON 31ST MARCH, 2024	NET VALUE AS ON 31ST MARCH, 2024
GENERAL ADMINISTRATION								
LAND	41129692		0	0	0	41129692	0	41129692
BUILDINGS	787261935		817300	0	0	788079235	573682204	214397031
MOTOR VEHICLES	36457868		1452416	8426194	0	29484090	10882672	18601418
PLANT AND MACHINARY	38379262		0	0	0	38379262	29801033	8578229
FURNITURE AND OFFICE EQUIPMENTS	429778494		261021691	3072609	521189	688248765	89444674	598804091
TOOLS AND EQUIPMENTS	3130347		0	167409	0	2962938	1775683	1187255
SECURITY EQUIPMENTS	3260388		0	0	0	3260388	2604212	656176
TOTAL	1339397987		263291407	11666212	521189	1591544371	708190478	883353893
ELECTRIC SUPPLY								
LAND	22953418		0	0	0	22953418	0	22953418
BUILDINGS	877755301		12537758	0	0	890293059	458778591	431514468
PLANT & MACHINERY	13112883584	*	416002115	33067593	989000	13496807106	8004236660	5492570446
CABLES & MAINS / PILLARS/ST.LIGHTING	13186502870	*	695979313	11539322	0	13870942861	5919547997	7951394864
METERS AND INSTALLATIONS	1517133893	*	101493	44372300	0	1472863086	966169505	506693581
STREET LIGHTING LAMPS	1681837174	@	28270605	0	0	1710107779	615166421	1094941358
D. E. A. ON HIRE	419928		0	0	0	419928	344906	75022
MOTOR VEHICLES	122277133		0	29434355	-887179	91955599	77504207	14451392
TOOLS AND EQUIPMENTS	495417716		749017	398601	0	495768132	226196380	269571752
FURNITURE AND OFFICE EQUIPMENTS	282303618	+	1934653	24421106	34392	259851557	255001580	4849977
TOTAL	31299484635		1155574952	143233275	136213	32311962525	16522946247	15789016278
BUSES								
LAND	667872253		0	0	0	667872253	0	667872253
BUILDINGS	1293946603		470683	0	0	1294417286	696066078	598351208
BUSES / MOH OF BUSES	4341037334	$	0	1143081697	8440141	3206395778	1389572239	1816823539
MOTOR VEHICLES/MOH OF MOTOR VEH.	118712296		0	33809743	3508358	88410911	54619859	33791052
PLANT AND MACHINERY	21360118		0	0	0	21360118	10732293	10627825
TOOLS AND EQUIPMENTS	104249513		0	0	0	104249513	74200488	30049025
FURNITURE AND OFFICE EQUIPMENTS	546430797	&	13649345	150094	2463898	562393946	222546436	339847510
TOTAL	7093608915		14120028	1177041534	14412397	5945099806	2447737393	3497362413
GRAND TOTAL	39732491537		1432986387	1331941021	15069799	39848606702	19678874118	20169732584

$ Inlcudes 804 Nos of Buses (AC CNG 5Nos(2.75Cr) + Low Flooring CNG SD 549 Nos (127.19 Cr) + Midi CNG 250 Nos (49.97 Cr) under JNNURM amounting to Rs. 179.91 Crs.

* Includes expenditure Incurred Under Accelerated Power Development Reform Programme Scheme of Central Government From Financial Year 2001-02 to 2008-09 amounting to Rs.291.66 Crs (Rs.143.21 Crores Under Plant & Machinery,Rs. 64.52 Crs Under Cable & Mains, Rs.75.02 Crs Under Meters & Rs. 8.91 Crs Under Office Equipments)

* Includes Expenditure Incurred Under Business Process Automation Project (BPAP) Amounting to Rs.102.85 crs. (Rs.51.71 +0.10+00.39 +47.65+3.00Lakhs)

* IDC of Rs."0.93 (crore)" was brought into Books of Accounts in FY 2023-24

$ Includes expenditure incurred towards procurement of 185 Nos of SD TATA buses (Lot 1/303) Rs. 90.56 Cr & Electric Hybrid buses (Lot 1/6) 6 Nos of buses Rs. 9.84Cr against Rs .100.00 Crs grant received from MCGM and Tejaswini SD buses (Lot 1 / 37) of Rs. 10.92 Crs. And 70 no. SD TATA CNG amt. Rs.11.30 crs. & 50 Nos. CNG Midi bus amt. Rs.9.00 Crs.

\+ Includes expenditure incurred towards procurement of Furniture & Office equipments of 44.86 lakhs under Skill Development at Traffic Training Centre, Dindoshi against Grant of Rs. 50.00 Lakhs received fr. Central govt.

Grant received under RDSS project Rs.58.38 Crs. From Central Govt. and Advance paid to L&T (Rs.9.86 crs.) + TATA power (Rs.24.52 crs.)+ Rahul Cables (Rs.15 Crs.) + Infinite Comp. Serv.(Rs.9 Crs)

* Includes Plant & Machinery of Rs. 108.72+0.11 Crs(21-22)+1.21 Crs (22-23) = 110.04 against 60% grant of Rs. 56.98 Crs received from Central Govr.for IPDS Project.

@ Includes expenditure incurred towards Street Lighting Lamps (Rs. 16.39+47.84 Crs (FY19-20) for LED Street Light Lanterns and lights/bulbs & 12.62 +4.97 (FY 19-20)= 17.59 Crs for Led street lanterns of various watts) against Grant of (Rs. 7.38+18.57 FY 2019-20) Rs.25.95 Crs received from MCGM.

& Includes expenditure incurred towards procurement of Furniture & office equipments of Rs. 30.98 under I T M S project against Grant of Rs. 07.37 Crs received from MCGM.

APPENDIX **E 7**

SCHEDULE OF GENERAL INVESTMENTS AS AT 31ST MARCH, 2024

Sr.No.	Comp. No.	Name	Face Value	Book Value	Market Value
1	2	8.83% IRFC 2034	3,50,00,000.00	3,50,00,000.00	3,50,00,000.00
		Total	3,50,00,000.00	3,50,00,000.00	3,50,00,000.00

Note:- **The above Investments are transferred from Electricity Supply Contiengency Reserve Fund Investment.**

APPENDIX NO. E-8

SOURCES AND APPLICATION OF FUNDS FOR THE YEAR ENDED 31ST MARCH 2024

(Rs. In Crores.)

Source of Fund	(As at 31st March, 2023)	(As at 31st March, 2024)
SOURCES OF FUNDS		
Funds	1131.21	1162.14
Other Dedicated Fund	289.17	298.80
Loan	2562.09	2888.66
Total	**3982.47**	**4349.60**
APPLICATION OF FUNDS		
Fixed Assets		
Gross Block	3973.25	3984.86
Less : Depreciation	-1962.12	-1967.89
Net Block	2011.13	2016.97
Capital work in Progress	44.14	47.45
Total	**2055.27**	**2064.42**
A. Investments	**92.60**	**93.92**
B. Current Assets		
Inventories	22.23	17.77
Sundry Debtors	685.09	783.29
Cash and Bank Balances	647.69	380.49
Other Current Assets	80.74	80.93
Total	**1435.75**	**1262.48**
C. Loans and Advances	436.50	494.98
Total A+B+C	**1964.85**	**1851.38**
Less : Current Liabilities and Provisions		
Liabilities	4037.16	4479.19
Provisions	0.21	0.33
TOTAL	**4037.37**	**4479.52**
Net Current Assets	**-2072.52**	**-2628.14**
Profit and Loss Account	**3999.73**	**4913.32**
TOTAL	**3982.48**	**4349.60**

APPENDIX E-9

MOVEMENT IN INTERNAL AND SPECIAL FUNDS AND PROVISIONS FOR THE YEAR 2023-2024

Particulars	Balance as on 1st Apr.2023	Provided during the Year	Amount Credited	Total	Amount Debited	Balance as on 31st Mar.2024
1	2.00	3	4	5	6	7
	₹	₹	₹	₹	₹	₹
Revenue Reserve Fund (101)	-	-	-	-	-	-
BEST Betterment Fund (Sec 460 LL(i)(b))(102)	-	-	-	-	-	-
Welfare Fund (Section 120 A)(103)	30,000.00	-		30,000.00	-	30,000.00
Property Insurance Fund(104)	1,87,97,27,265.00	7,02,99,543.00	-	1,95,00,26,808.00	672.86	1,95,00,26,135.14
Third Party Insurance Fund(105)	-	7,15,94,538.00	-	7,15,94,538.00	7,15,94,538.00	-
Motor Vehicles (Third Party Insurance Fund)(106)	(7,07,441.00)	-	-	(7,07,441.00)	8,50,000.00	(15,57,441.00)
Electric Supply Contingencies Reserve Fund(107)	76,58,64,424.00	7,98,14,163.00	-	84,56,78,587.00	-	84,56,78,587.00
Fidelity Insurance Fund(108)	29,99,999.00	-	-	29,99,999.00	-	29,99,999.00
BEST Staff Benefit Fund (SEC 460 H. H.)(109+110)	16,15,44,709.00	-	1,35,17,668.50	17,50,62,377.50	14,95,500.00	17,35,66,877.50
General Fund(111)	-			-		-
Special Depreciation Fund(112)	-			-		-
Generation of Electricity Fund(114)	1,96,87,30,105.00	-	-	1,96,87,30,105.00	-	1,96,87,30,105.00
B. E. S. T. Staff Amenities Fund(421)	-	-	4,25,71,971.00	4,25,71,971.00	4,25,71,971.00	-
Provision for Depreciation Fund(423)	19,62,11,57,547.00	1,24,47,80,208.00	-	20,86,59,37,755.00	* 1,18,69,96,927.88 66,707.00	19,67,88,74,120.12
Provision for Obsolescence of Stores(424)	28,45,411.00	19,10,000.00		47,55,411.00		47,55,411.00
Return on Equity	-			-		-
Passenger Insurance Fund (117)	2,52,00,000.00			2,52,00,000.00		2,52,00,000.00
Best Group Insurance Fund(118)	(44,20,599.00)		54,15,379.00	9,94,780.00	9,93,951.00	829.00
TOTAL	24,42,29,71,420.00	1468398452	6,15,05,018.50	25,95,28,74,890.50	1,30,45,70,267.74	24,64,83,04,622.76
GRANT FROM STATE/CENTRAL GOVT.,(115)	9,40,41,86,804.00		** 1,54,48,12,000.00	11,04,26,99,990.00	1,39,95,16,307.00	9,64,31,83,683.00
CAPITAL CONNECTION FEES			@ 9,37,01,186.00			
GRAND TOTAL	33,82,71,58,224.00	1,46,83,98,452.00	1,70,00,18,204.50	36,99,55,74,880.50	2,70,40,86,574.74	34,29,14,88,305.76

* ASSETS WRITTEN OFF	1,18,69,96,927.88
** GRANT RECEIVED	
FIN ASST. FOR IPDS	4,76,00,000.00
MAHARASHTRA EV POLICY FOR 3000 EV BUSES	1,75,00,000.00
RDSS GRANT RECV FROM GOV OF INDIA	29,19,00,000.00
GRANT FROM MCGM	1,18,78,12,000.00
TOTAL	**1,54,48,12,000.00**
@ CAPITAL CONNECTION FEE	9,37,01,186.00 *
TOTAL	2,82,55,10,113.88

APPEENDIX NO. **E 10**

SCHEDULE OF ELECTRIC SUPPLY CONTINGENCIES RESERVE FUND INVESTMENTS AS AT 31ST MARCH, 2024

Sr. No.	Comp. No.	Particulars	Date of Invt.	Face Value	Book Value	Int.Rate	Date of Maturity	Market Value
1	2	8.83% IRFC 2034	06.10.10	3,50,00,000.00	3,50,00,000.00	8.83	14.05.34	3,50,00,000.00
2	8	10.03% Rajasthan SDL Spl. 2028	19.11.14	1,00,00,000.00	1,00,00,000.00	10.03	18.10.28	1,00,00,000.00
3	10	8.21% Haryana SDL Spl 2026	30.11.16	5,00,00,000.00	5,00,00,000.00	8.21	31.03.26	5,00,00,000.00
4	11	8.19 Raj SPL Uday SDL 2026	30.11.16	50,00,000.00	50,00,000.00	8.19	23.06.26	50,00,000.00
5	12	7.73% WB SDL 2032	17.11.17	6,00,00,000.00	6,00,00,000.00	7.73	11.08.32	6,00,00,000.00
6	13	8.45% Assam SDL 2029	29.03.19	4,60,00,000.00	4,60,00,000.00	8.45	03.06.29	4,60,00,000.00
7	14	8.84% Rajasthan SDL 2028	29.03.19	1,00,00,000.00	1,00,00,000.00	8.84	09.12.28	1,00,00,000.00
8	15	8.18% Haryana Uday 2025	20.01.20	2,60,00,000.00	2,60,00,000.00	8.18	15.03.25	2,60,00,000.00
9	16	8.20% Haryana SDL 2028	20.01.20	3,60,00,000.00	3,60,00,000.00	8.20	02.07.28	3,60,00,000.00
10	17	10.03% Raj SDL SPL 18.10.28	31.03.21	3,30,00,000.00	3,30,00,000.00	10.03	18.10.28	3,30,00,000.00
11	18	6.91% Maharashtra SDL 2033	29.10.21	1,20,00,000.00	1,20,00,000.00	6.91	15.09.33	1,20,00,000.00
12	19	8.30% G.O.I. 2042	01.12.21	10,00,000.00	10,00,000.00	8.30	31.12.42	10,00,000.00
13	20	7.14% Kerala SDL 2035	31.12.21	7,12,00,000.00	7,12,00,000.00	7.14	29.12.35	7,12,00,000.00
14	21	7.83% Rajasthan SDL 2032	28.06.22	5,00,00,000.00	5,00,00,000.00	7.83	22.06.32	5,00,00,000.00
15	22	7.79% Tamil Nadu SDL 2028	20.10.22	7,40,00,000.00	7,40,00,000.00	7.79	04.10.32	7,40,00,000.00
16	23	7.87 Himachal Pradesh SDL 2035	30.11.22	5,00,00,000.00	5,00,00,000.00	7.87	09.11.35	5,00,00,000.00
17	24	7.85% West Bengal SDL 2042	06.07.23	2,80,00,000.00	2,80,00,000.00	7.85	29.03.42	2,80,00,000.00
18	25	7.89% West Bengal SDL 2040	06.07.23	5,00,00,000.00	5,00,00,000.00	7.89	29.03.40	5,00,00,000.00
		TOTAL		**64,72,00,000.00**	**64,72,00,000.00**			**64,72,00,000.00**

APPENDIX NO E:11

Cash Flow Statement for the Year Ended 31 March, 2024

(₹ In Crores)

Particulars	For the year ended 31-03-2023	For the year ended 31-03-2024
A) Cash Flow from operating activities :		
Difference in Net Profit /(Loss) - Cumulative	(952.02)	(913.59)
(Profit) / Loss on sale of Fixed Assets	-	-
Depreciation	75.00	5.77
Contingencies Reserve Fund	7.61	7.98
Miscellaneous Expenditure Written off	0.00	0.00
Interest Expenses	0.00	0.00
Other provision (propins, sb fund , ge, best group insu)	1.27	8.68
Non Operating Income	0.00	
Operating Profit/(Loss) before working capital changes	(868.14)	(891.16)
A)Adjustments for changes in Working Capital:		
Adjustments for application Fund	0.00	0.00
Decrease / (Increase) in Stores & Spares	(1.77)	4.46
Decrease / (Increase) in Sundry Debtors	13.83	(98.20)
Decrease / (Increase) in other Current Assets	(0.56)	(0.19)
Decrease / (Increase) in Loans and Advances	(121.85)	(58.48)
Increase / (Decrease) in Current Liabilities, Deposits and Provisions	677.95	442.14
Cash flow from Operations **(I)**	**(300.54)**	(601.43)
B) Cash flow from investing activities		
Net cash flow from Purchase / sale of Fixed Assests	(140.36)	(11.61)
Net (Increase)/Decrease in Investments	(12.93)	(1.32)
Non Operating Income	0.00	0.00
Net (Increase)/Decrease in Capital work in progress	(6.67)	(3.31)
Net cash flow from investing activities **(II)**	(159.96)	(16.24)
C) Cash flow from financing activities		
Government Grant / Consumer Contribution received	34.08	23.90
Net increase/(Decrease) in Long Term Loans	655.17	326.57
Interest Expenses	0.00	0.00
Internal Reserve Difference	0.00	0.00
Net cash flow from financing activities **(III)**	689.25	350.47
Net Cash Inflow/(Outflow) (I)+(II)+(III)	228.75	(267.20)
Cash and Bank equivalents at beginning of the period	418.94	647.69
Cash and Bank equivalents at closing of the period	647.69	380.49

* Revised as per the MCA Report on Annual Accounts of F.Y. 2013-14 under para No. 4.

APPENDIX NO. E-12

ABSTRACT OF RECEIPTS AND EXPENDITURE FOR THE YEAR ENDED 31ST MARCH,2024

RECEIPTS	₹	DISBURSEMENTS	₹
Balance as on 01-04-2023	3,41,57,22,583		
A: **Revenue Accounts**		A: **Revenue Accounts**	
Administration		General Administration	2,32,16,96,262
		Electric Supply	41,86,49,15,100
Miscellaneous Receipts	39,71,42,160	Buses	30,39,24,72,722
Electric Supply			
Distribution of Electric Energy	41,85,14,47,703	Statutory Transfer to Municipal & Other Funds	-
Street Lighting	80,93,53,766		
E. D. Collecting charges, delay payment charges etc.	38,32,92,726	Minimum Cash Balance as per Section 460kk(1)	-
Other Receipts	17,04,67,445		
		B: **Capital Account**	
BUSES		General Administration	26,32,91,407
		Electric Supply	1,15,55,74,952
Traffic Receipts	19,98,35,07,331	Buses	1,41,20,028
Other Receipts	1,29,04,62,526	Loan Funds	10,42,54,48,090
B: **Capital Account**		Other Items	-1316871222.08
Loan Funds - Debts Principal	15,70,02,51,300		
C: **Other Accounts**		C: **Other Accounts**	
1) Sinking Fund	-	1) Sinking Fund	-
2) Special & Internal Funds	33,19,09,584	2) Special and Internal Funds	24,60,17,117
3) Sinking, Special & Internal Funds Investments (Paper & Cash)	31,82,00,000	3) Sinking,Special & Internal Funds Investments (Paper & Cash)	27,29,00,000
4) Suspense Accounts		4) Suspense Accounts	
I) Deposits	64,56,36,824	i) Deposits	17,98,15,605
ii) Stores Accounts Purchases	5,14,32,20,226	ii) Stores Accounts Purchases	5,42,09,98,520
iii) Miscellaneous	2,69,73,61,46,224	iii) Miscellaneous	2,65,20,81,27,710
		Balance as on 31-03-2024	3,72,82,54,106
GRAND TOTAL	**3,60,17,67,60,400**	**GRAND TOTAL**	**3,60,17,67,60,400**

I Signed, subject to my Audit Report U/No.MCA/025/24-25/03 dtd.27/09/2024 on the 2023-24 Accounts of B.E.S. & T. Undertaking & Certificate U/No. MCA/025/24-25/02 dtd. 27/09/2024 . ... herein.

M.C.A. DEPARTMENT BMC

CAO & FA (Del.) | Dy.M.(A) | Municipal Chief Auditor | General Manager

Municipal Chief Auditor

APPENDIX NO. E-13

STATEMENT OF SHORT TERM FINANCIAL ASSISTANCE FOR THE F.Y. 2023-24 (Rs. In Crores)

Sr.NO.	BANK NAME	INT. Rate	Sanction Amount	Loan Period		O/S As on 31.03.2023	S.T.F.A. Raised	S.T.F.A. Repaid	O/S As on 31.03.2024
(A)	SHORT TERM LOANS			From	To				
1	BANK OF INDIA	8.80%	110.00	15.09.2023	14.09.2024	0.00	110.00	50.00	60.00
		8.80%	90.00	27.09.2023	15.09.2024	0.00	90.00	0.00	90.00
2	Canara Bank	8.55%	200.00	14.06.2023	14.06.2024	0.00	200.00	100.00	100.00
		8.70%	200.00	14.03.2024	14.03.2025	0.00	200.00	0.00	200.00
3	HDFC BANK	8.05%	100.00	31.12.2022	30.12.2023	75.00	0.00	75.00	0.00
		8.31%	100.00	09.11.2023	09.11.2024	0.00	100.00	33.33	66.67
		8.15%	50.00	29.11.2023	29.11.2024	0.00	50.00	16.67	33.33
		8.31%	75.00	29.02.2024	28.02.2025	0.00	75.00	6.25	68.75
4	RURAL ELECTRIFICATION CORPORATION LTD.	9.25%	60.00	28.04.2023	15.04.2024	0.00	60.00	50.00	10.00
	SHORT TERM LOAN TOTAL - (A)					75.00	885.00	331.25	628.75

* RATE OF INTEREST FOR THE MONTH MARCH- 2024 IS SHOWN AS INTEREST RATES ARE FLUCTUATED DURING THE FINANCIAL YEAR.

The Brihan Mumbai Electric Supply & Transport Undertaking

BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001

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Cost Audit Report

FY 2022-23

Jitendrakumar & Associates

Cost & Management Accountants

708-A, 7th Floor, P.J. Tower, Bombay Stock Exchange
Dalal Street, Fort Mumbai – 400001

Email id : jitendrakumarassociates@gmail.com

Contact : +91 9699024004

Form CRA-3

[Pursuant to rule 6(4) of the Companies (Cost Records and Audit) Rules, 2014]
FORM OF THE COST AUDIT REPORT

We, **M/s Jitendrakumar & Associates** having been appointed as Cost Auditor(s) to submit the cost audit report to MERC as per regulations 23.4 of the MERC (MYT) regulations 2019 of **The Brihan Mumbai Electric Supply & Transport Undertaking** having its registered office at **BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001,** (herein after referred to as the company), have audited the Cost Records and other relevant records maintained in respect of the product group "**Electricity**" for the financial year **2022-23** in compliance with the cost auditing standards by the Company and report, in addition to our observations and suggestions in Para 2.

i. We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of this audit.

ii. In our opinion, proper cost records, as prescribed under cost accounting standards, have been maintained by the company so as to give a true and fair view of the cost and margin of the product groups under reference.

iii. In our opinion, proper records adequate for the purpose of the Cost Audit have been received from the branches not visited by us.

iv. In our opinion and to the best of our information, the said books and records give the information in the manner so required.

v. In our opinion, the said books and records are in conformity with the Cost Accounting Standards issued by The Institute of Cost Accountants of India; to the extent these are found to be relevant and applicable.

vi. In our opinion, company has adequate system of internal audit of cost records which to our opinion is commensurate to its nature and size of its business.

vii. Detailed unit-wise and product-wise cost statements and schedules thereto in respect of the product groups under reference of the company duly audited and certified by us are kept in the company.

2. Observations and suggestions, if any, of the Cost Auditor, relevant to the cost audit.

(a) The Cost Accounting Records of the company have been maintained in accordance with CRA-1 of the Rules and are also in conformity with the generally accepted cost accounting principles and cost accounting standards issued by the institute of Cost Accountants of India to the extent these are found to be relevant and applicable. There has been no change in the system of cost accounting during the year under review and the same is being followed consistently by the company.

JITENDRAKUMAR & ASSOCIATES

(b) The annexures to the Cost Audit Report from Part A to D are integral part of this report.

(c) The Available Capacity shown in Part B-1 in respect of the different Products, wherever applicable, is as certified by the management.

(d) Normal Price and basis adopted to determine the normal price are as certified by the Management.

(e) The non-cost revenue and the expenses for the period have been disclosed in the reconciliation of profit/loss para after discussion with the management.

Management's Responsibility for the Cost Records

The Company is responsible for preparation of the Cost Records that give a true and fair view of the Cost Sheets & Annexures to the Cost Audit Report in accordance with the Generally Accepted Cost Accounting Principles and the cost records as per the Companies (Cost Records & Audit) Rules, 2014 read with its amendments. This responsibility also includes maintenance of adequate cost accounting records in accordance with the provisions of the Act and the Rules for preventing and detecting frauds and other irregularities; selection and application of appropriate Cost accounting policies; making judgements and estimates that are reasonable and prudent; and design, Implementation and maintenance of adequate internal financial controls, relevant to the preparation and presentation of the Annexures to the Cost Audit Report that give a true and fair view and are free from material misstatements, whether due to fraud or error.

Auditors Responsibility

Our responsibility is to express an opinion on these Cost Records based on our audit. We have taken into consideration the signed standalone financial statements provided to us by the management, the provisions of the Act, The Cost Accounting and Auditing Standards and the matters which are required to be included in the Cost Audit Report under the provisions of the Act and Rules made thereunder. We have conducted our audit in accordance with the Standards on Cost Auditing as specified under section 148(3) of the Act. Those Standards required that we comply with the ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the cost records are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the cost records. The procedures selected depend on the auditor's judgement, including the assessment of risks of material misstatement of the cost records, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the Company's preparation of the cost records that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for expressing an opinion on whether the company has in place an adequate internal financial controls system and the operating effectiveness of such controls.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion on the cost records and in accordance with the rules and processes laid by MERC, appropriate samples were randomly selected, opinion & explanations were seeked from the respective managements wherever required.

Disclosures

i. The Management, executives, staff, members, etc. gave the audit team their full co-operation in conducting the cost audit.

ii. All facts mentioned in this report were discussed, deliberated, consulted, etc. with the management, wherever deemed fit. the opinions and suggestions have been incorporated satisfactorily, the said report is well within the knowledge and due notice of the management.

iii. Annexures to Cost Audit Report is the responsibility of the Company's Management. This responsibility also includes maintenance of adequate cost accounting records in accordance with the provisions of the Act and the Rules for preventing and detecting frauds and other irregularities; selection and application of appropriate Cost accounting policies; making judgements and estimates that are reasonable and prudent; and design, Implementation and maintenance of adequate internal financial controls, relevant to the preparation and presentation of the Annexures to the Cost Audit Report that give a true and fair view and are free from material misstatements, whether due to fraud or error. Our audit includes examining, on a test basis, evidence supporting these statements to verify that these statements are free of material misstatement. Our Observations and suggestions are based on the information contained in these Statements.

iv. In our opinion, the Cost Accounting Records are in conformity with the Cost Accounting Standardsissued by The Institute of Cost Accountants of India to the extent these are found to be relevant and applicable. The Cost Auditing Standards have not been notified by the competent authority on the date of this report and as such the compliance thereof is not applicable.

v. The Cost Records and Annexures to the Cost Audit Report are based on financial accounts approved by the Competent Authority of the company.

For Jitendrakumar & Associates
Cost Accountants

JITENDRAKUMAR & ASSOCIATES FRN-101561 COST ACCOUNTANTS MUMBAI

FCMA Jitendrakumar Yadav
Sr. Partner
Membership No. 30106

Dated : 15-10-2024
Place : Mumbai
UDIN : 2430106ZZ8XZ5EDL62

3. **Cost Accounting Policy**

1) **Briefly describe the cost accounting policy adopted by the Company and its adequacy or otherwise to determine correctly the cost of production/operation, cost of sales, sales realization and margin of the product(s)/service(s) under reference separately for each product(s)/service(s). The policy shall cover, inter alia, the following areas:**

Cost accounting policy adopted by the Company keeping in view the requirements of the Companies (Cost Records and Audit) amendment (Rules),2014 and also the Cost Auditing Standards, under Section 148 (3) of the Companies Act 2013.

Cost records are prepared to conform with CRA 1 guidelines of Companies (Cost Records and Audit) amendment (Rules) 2014 and Cost Accounting Standards issued by The Institute of Cost Accountants of India.

a) **Identification of cost centres/ cost objects and cost drivers**: -

The company has accounting system with cost centers, cost object & cost drivers are properly identified for the product. Each site is a cost centre with activities like procurement, stores, quality control, etc. The product acts as the primary cost objects to which all cost are ultimately assigned and allocated.

b) **Accounting for material cost including packing materials, stores and spares etc., employee cost, utilities and other relevant cost components**: -

i. **Material Cost**: -

Material receipts are valued at purchase price, including duties and taxes (net of credits), freight inward, insurance and other expenses directly attributable to the same. The material cost are assigned to products based on consumption of inputs.

ii. **Packing Cost**: -

Not applicable.

iii. **Employee Cost**: -

The employee cost has been calculated as per Cost Accounting Standard 7. Aggregate value of all kinds of consideration paid & payable has been considered properly. Employee cost is traced to specific cost centre depending on the department of the employee. Cost centre wise employee cost is allocated over the products depending upon the nature of each cost centre.

iv. **Utilities**: -

Utilities cost include cost of power for auxiliary consumption has been considered in cost of utilities and loaded to the cost centres based on the actual consumptions. The cost of utility has been treated as distinct cost object as per Cost Accounting Standard 8.

c) **Accounting, allocation and absorption of overheads**: -

Administrative overheads are apportioned based on aggregate of employees cost, office rent, travelling expenses of each production cost centres. Apportionment of all overheads is made to various cost centres. The overheads are apportioned as per Cost Accounting standard 3 & 11.

d) **Accounting for Depreciation/ Amortization**: -

Depreciation of various plants & machinery, building and other equipments has been accountedfor the product cost centre. Depreciation is provided on straight-line method. The estimated life of the assets is based on the MERC Regulation 2019.The rates of depreciation on various class of assets and the policy for calculation of depreciation is as per the MERC Regulation 2019

e) **Accounting for by-products/ joint-products, scraps, wastage etc.**: -

Wastage/scrap derived during manufacturing process is accounted for product cost centrethrough the accounting system.

f) **Basis for Inventory Valuation**: -

Not applicable.

g) **Methodology for valuation of Inter-Unit/Inter Company and Related Partytransactions: -**

There are related party transactions during the year. The Company use cost plus method for valuation of related party transaction.

h) **Treatment of abnormal and non-recurring costs including classification of othernon-cost items**: -

Abnormal, non-recurring costs and other non-cost items are shown under reconciliation of financial accounting profits and costing accounting profits in the report. Abnormal/Non-recurring costs are not considered for product costing.

i) **Other relevant cost accounting policy adopted by the Company**: -

Nil.

2) **Briefly specify the changes, if any, made in the cost accounting policy for the product(s)/service(s) under audit during the current financial year as compared to theprevious financial year**: -

No such changes in the current financial year.

3) **Observations of the Cost Auditor regarding adequacy or otherwise of the BudgetaryControl System, if any, followed by the company**: -

Budgetary control system prevalent in the company is considered adequate, taking intoaccount the size of the Company and the nature of its operations.

JITENDRAKUMAR & ASSOCIATES

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2022 to 31st March 2023

	GENERAL INFORMATION	
1	Corporate identity number or foreign company registration number	N.A.
2	Name of company/undertaking	The Brihan Mumbai Electric Supply & Transport Undertaking
3	Address of registered office or of principal place of business in India of company	BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001
4	Address of corporate office of company	BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001
5	Email address of company	accounts@bestundertaking.com
6	Date of start of reporting period	01-04-2022
7	Date of end of reporting period	31-03-2023
8	Date of start of first previous financial year	01-04-2021
9	Date of end of first previous financial year	31-03-2022
10	Level of rounding used in cost statements	in Lakh
11	Reporting currency of entity	INR
12	Number of cost auditor(s) for reporting period	1
13	Date of board of directors' meeting in which annexure to cost audit report was approved	N.A.
14	Whether cost auditors report has been qualified or has any reservations or contains adverse remarks	No
15	Consolidated qualifications, reservations or adverse remarks of all cost auditors [text block]	As Per CRA-3
16	Consolidated observations or suggestions of all cost auditors	As Per CRA-3
17	Whether company has related party transactions for sale or purchase of goods or services	N.A.

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : GAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking		
1st April 2022 to 31st March 2023		
GENERAL DETAILS OF COST AUDITOR		
1	Whether cost auditor is lead auditor	Yes
2	Category of cost auditor	Firm
3	Firm's registration number	101561
4	Name of cost auditor or cost auditors firm	Jitendrakumar & Associates
5	Permanent account number of cost auditor or cost auditors firm	AAMFJ2611C
6	Address of cost auditor or cost auditors firm	708A, P.J. Tower, 7th Floor, BSE, Dalal Street, Fort, Mumbai, 400 001,
7	Email id of cost auditor or cost auditors firm	jitendrakumarassociates@gmail.com.
8	Membership number of member signing report	30106
9	Name of member signing report	Jitendrakumar Rambaran Yadav
10	Name of product or services with CETA HEADING	Transmission & Distribution of Electricity
11	SRN number of Form 23C/CRA 2	NA
12	Number of audit committee meeting attended by cost auditor during year	N.A
13	Date of signing cost audit report and annexure by cost auditor	15-10-2024
14	Place of signing cost audit report and annexure by cost auditor	Mumbai

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply
& Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE.
Designation : GA(BFA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2022 to 31st March 2023

SrNo	Name of Product / Service	UOM	CETA	Covered under	Whether Previous	Net Opertional Revenue	
	4. Product / Service Details (for the company as a whole)						
	Service Provided:-					CURRENT YEAR	PREVIOUS YEAR
1	Transmission & Distribution of Electricity		N.A	YES	YES	3,60,190	3,04,768
3	Sale of Scrap			NO	NO	607	136
	Total Net Revenue from Operations					**3,60,797**	**3,04,904**
	Other Incomes of Company					8,179	7,125
	Total Revenue as per Financial Accounts					**3,68,976**	**3,12,029**
	Extra Ordinary Income, If any					-	-
	Total Revenue including extra ordinary Income, If any					**3,68,976**	**3,12,029**
	Turnover as per GST						

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEV SAKHARE
Designation : GAO&FA(Delegation)

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
1st April 2022 to 31st March 2023

QUANTITATIVE INFORMATION (for each product ceta separately)

	4 Digit Ceta code	N.A		
	Service Name	Transmission or Distribution of Electricity		
	FINANCIAL YEAR :	2022-23		
	PARTICULARS	UOM	Current Year	Previous Year
	1. AVAILABLE CAPACITY:			
a)	Installed Capacity	Lacs	N.A	N.A
b)	Capacity Enhanced During the Year	Lacs	N.A	N.A
c)	Capacity available through leasing arrangements, if	Lacs	N.A	N.A
d)	Capacity available through loan license/ third partie	Lacs	N.A	N.A
e)	**Total available capacity**	Lacs	N.A	N.A
	2. Actual Production:			
a)	Self Manufactured	Lacs	N.A	N.A
b)	Produced under leasing arrangements	Lacs	N.A	N.A
c)	Produced on loan license/ by third parties on job wo	Lacs	N.A	N.A
d)	**Total Production**	Lacs	N.A	N.A
	3.Production as per Excise Records:	Lacs	N.A	N.A
	4. Capacity utilisation (In House)	Lacs	N.A	N.A
	5.Finished Goods Purchased			
a)	Domestic purchase	Lacs	48,363	44,072
b)	Imports			
c)	**Total Finished Goods Purchased**	Lacs	**48,363**	**44,072**
	6. Stock & Other Adjustments:			
a)	Change in Stock of Finished Goods	Lacs	N.A	N.A
b)	Self / Captive Consumption (incl. samples etc.)	Lacs	N.A	N.A
c)	Other Quantitative Adjustments, if any (Wastage. Et	Lacs	3,530	N.A
d)	**Total Adjustments**	Lacs	N.A	N.A
	7. Total Available Quantity for sale { 2[d] + 5[c] +	Lacs	**44,833**	**44,072**
	8. Actual Sales:			
a)	Domestic Sales(Manufacturing)	Lacs	N.A	N.A
b)	Domestic Sales(Trading)	Lacs	44,833	40,784
c)	Export Sales(Manufacturing)	Lacs	N.A	N.A
d)	Export Sales (Trading)	Lacs	N.A	N.A
e)	**Total Quantity Sold**	Lacs	**44,833**	**40,784**

Note Distribution loss for FY 2022-23 is considered 4.18% & Transmission Loss for FY 2022-23 is 1.10%

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE.
Designation : CAO&FA(Delegation)

Date : - 15-10-2024
Place:- Mumbai

1st April 2022 to 31st March 2023

2. ABRIDGED COST STATEMENT.

Name of the Service			Transmission or Distribution of Electricity			
CETA Heading			NA			
UOM			Lacs			
	Production	FG Purchased	Finished Stock Adjustments	Captive consumption	Other Adjustments	Quantity Sold
CURRENT YEAR		48,363.17	-	-	3,530.00	44,833.17
PREVIOUS YEAR		44,072.02	-	-	-	40,784.32

Sr	Description	CURRENT YEAR Amount	CURRENT YEAR Rate/unit	PREVIOUS YEAR Amount	PREVIOUS YEAR Rate/unit
1	Cost of materials consumed				
2	Cost of process materials or chemicals consumed				
3	Cost of utilities consumed				
4	Cost of direct employees				
5	Cost of direct expenses				
6	Cost of stores and spares consumed				
7	Cost of repairs and maintenance	52,403	1.08	23,448.31	0.53
8	Cost of quality control	197	0.004	182.32	0.00
9	Cost of research and development	2,519	0.05	1,466.77	0.03
10	Cost of technical knowhow fee or royalty				
11	Cost of depreciation or amortization	10,929	0.23	10,757.63	0.24
12	Cost of other production overheads	67	0.001		
13	Cost of industry specific operating expenses				
14	**Total of inputs and conversion cost**	66,115	1.37	35,855.03	0.81
15	Cost of increase/decrease in work-in-progress				
16	Credits for recoveries				
17	Cost of primary packing				
18	**Cost of production or operations**	66,115	1.37	35,855.03	0.81
19	Cost of finished goods purchased	3,78,736	7.83	2,83,254.84	6.43
20	**Total cost of production and purchases**	4,44,851	9.20	3,19,109.86	7.24
21	Cost of increase/decrease in finished goods				
22	Cost of self or captive consumption				
23	Cost of other adjustments				
24	**Cost of production or operations of goods or services sold**	4,44,851	9.20	3,19,109.86	7.24
25	Cost of administrative overheads	9,116	0.20	14,707.48	0.36
26	Cost of secondary packing				
27	Cost of selling and distribution overheads	3,924	0.088	21,243.86	
28	**Cost of sales before Interest**	4,57,891	10.21	3,55,061.21	8.71
29	Cost of interest and financing charges	11,923	0.27	9,816.50	0.24
30	**Cost of sales of product or activity group**	**4,69,814**	**10.48**	**3,64,877.71**	**8.95**
31	**Net sales realization of product or activity group**	**3,60,797**	**8.05**	**3,04,903.95**	**7.48**
32	**Amount of margin as per cost accounts**	**-1,09,017**	**(2.43)**	**-59,973.76**	**(1.47)**

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : GAO&FA(Designation)

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2022 to 31st March 2023

1. PRODUCT AND SERVICE PROFITABILITY STATEMENT (for audited products/services)

Sr No	Particulars	Current Year			Previous Year		
		Sales	Cost of sales	Margin	Sales	Cost of sales	Margin
1	Transmission & Distribution of Electricity	3,60,797	4,69,814	(1,09,017)	3,04,904	3,64,878	(59,974)
	Total	3,60,797	4,69,814	(1,09,017)	3,04,904	3,64,878	(59,974)

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply &
Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE.
Designation : GAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2022 to 31st March 2023

2. PROFIT RECONCILIATION (for the company as a whole)			
Sr no.	**Particulars**	**Current Year**	**Previous Year**
1	**Profit/loss as per Cost Accounting Records**	**(1,09,017)**	**(59,974)**
	(a) For the Audited Product(s) /service(s)	(1,09,017)	(59,974)
	(b) For the Un-audited Product(s) /service(s)		
2	**Add: Incomes not considered in Cost accounts (specify details)**	**8,179**	**7,125**
	Bank Deposits	55	76
	Rent of building & Land	629	412
	E.D. Collection & DP Chgs	3,916	4,900
	Profit on sale of assets'	984	971
	Misc Income	20	8
	Discount, Sundry balance Written Back	2,337	758
	Advertisement Receipts	238	0
3	**Less: Expenses not considered in cost accounts (specify details)**	**8,146**	**8,065**
	HIRING OF REFRIGERATOR & OTHER	0	0
	ELECTRICAL APPLIANCE ON HIRE	0	3
	CLEANING AND DISINFECTING -Corona	15	37
	CLEANING & DISINFECTING DEPART	0	0
	BAD DEBTS	565	459
	OTHER EXPENDITURE	583	874
	STOCK ADJUSTMENT	1	1
	CELEBRATION OF REPUBLIC DAY /	0	0
	MAHAPARINIRVAN DAY	3	0
	WEATHER FORECAST PROVIDER	-	3
	PROVISION FOR OBSOLESCENCE	4	4
	STREET LIGHTING EXPENSE	6,974	6,684
	Past Revenue Surplus	-	-
	ELECT. SUPPLY CONTIN. RESERVE	-	-
4	**Diffrence in Valuation of stock between financial accounts and cost accounts**		
5	**Profit or Loss as per Financial Accounts**	**(1,08,984)**	**(60,914)**

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply
& Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : CAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2022 to 31st March 2023

3.VALUE ADDITION AND DISTRIBUTION OF EARNING (for the company as a whole)			
Sr. No.	**Particulars**	**Current Year Rs.**	**Previous Year Rs.**
	Value Addition:		
1	Gross Sales (excluding sales returns)	3,68,976	3,12,029
2	Less: Excise Duty,etc.		
3	Net Sales	3,68,976	3,12,029
4	Add: Export Incentives		
5	Add/Less: Adjustments in finished stocks		
6	Less: Cost of bought out inputs		
	(a)Cost of Materials Consumed		
	(b)Process Materials / Chemicals		
	(c)Consumption of Stores & Spares		
	(d)Utilities (e.g. power & fuel)		
	(e)Others,if any (specify PURCHASE OF POWER & RELATED MATERIAL)	3,77,499	2,83,665
	Total Cost of bought out inputs	**3,77,499**	**2,83,665**
7	**Value Added**	**(8,523)**	**28,363**
8	Add:Income from Other sources		
9	Add:Extra ordinery Income		
10	**Earnings available for distribution**	**(8,523)**	**28,363**
	Distribution of Earnings to:		
1	Employees as salaries & wages, retirement benefits, etc.	59,533	
2	Shareholders as dividend	-	
3	Company as retained funds	(98,055)	(50,156)
4	Government as taxes	-	
5	Extra ordinery Expenses	-	
6	Others, if any (specify)	29,999	78,519
7	**Total distribution of earnings**	**(8,523)**	**28,363**

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply
& Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : CAO&FA(Delegation)

4.FINANCIAL POSITION AND RATIO ANALYSIS (for the company as a whole)

	Particulars	Units	Current Year	Previous Year
A.	**Financial Position**			
1	Share Capital			
2	Reserves & Surplus		4,66,672	5,68,258
3	Long Term Borrowings		2,14,891	1,75,066
4	(a) Gross Assets		10,22,792	9,94,020
	(b) Net Non-Current Assets		1,65,076	1,59,527
5	(a) Current Assets		8,42,756	8,20,840
	(b) Less: Current Liabilities		2,88,057	2,05,917
	(c) Net Current Assets		5,54,699	6,14,923
6	Capital Employed		4,66,672	5,68,258
7	Net Worth		4,66,672	5,68,258
B.	**Financial Performance**			
1	Value added		(8,523)	28,363
2	Net Revenue from Operations of Company		3,68,976	3,12,029
3	Profit before Tax (PBT)		(1,08,984)	(60,913)
C.	**Profitability Ratios**			
1	PBT to Capital Employed (B3/A6)	%	-23.35%	-10.72%
2	PBT to Net Worth (B3/A7)	%	-23.35%	-10.72%
3	PBT to Value Added (B3/B4)	%	1278.67%	-214.76%
4	PBT to Net revenue from operations (B3/B2)	%	-30%	-19.52%
D.	**Other Financial Ratios**			
1	Debt-Equity Ratio		0.46	0.31
2	Current Assets to Current Liabilities		2.93	3.99
3	Valued Added to Net Revenue from Operations	%	-2%	9.09%
E.	**Working Capital Ratios**			
1	Raw Materials Stock to Consumption	month	NA	NA
2	Stores & Spares to Consumption	month	NA	NA

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 15-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE.
Designation : GAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking

BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001

बेस्ट

Cost Audit Report

FY 2023-24

Jitendrakumar & Associates

Cost & Management Accountants

708-A, 7th Floor, P.J. Tower, Bombay Stock Exchange

Dalal Street, Fort Mumbai – 400001

Email id : jitendrakumarassociates@gmail.com

Contact : +91 9699024004

Form CRA-3

[Pursuant to rule 6(4) of the Companies (Cost Records and Audit) Rules, 2014]
FORM OF THE COST AUDIT REPORT

We, **M/s Jitendrakumar & Associates** having been appointed as Cost Auditor(s) to submit the cost audit report to MERC as per regulations 23.4 of the MERC (MYT) regulations 2019 of **The Brihan Mumbai Electric Supply & Transport Undertaking** having its registered office at **BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001,** (herein after referred to as the company), have audited the Cost Records and other relevant records maintained in respect of the product group **"Electricity"** for the financial year **2023-24** in compliance with the cost auditing standards by the Company and report, in addition to our observations and suggestions in Para 2.

i. We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of this audit.

ii. In our opinion, proper cost records, as prescribed under cost accounting standards, have been maintained by the company so as to give a true and fair view of the cost and margin of the product groups under reference.

iii. In our opinion, proper records adequate for the purpose of the Cost Audit have been received from the branches not visited by us.

iv. In our opinion and to the best of our information, the said books and records give the information in the manner so required.

v. In our opinion, the said books and records are in conformity with the Cost Accounting Standards issued by The Institute of Cost Accountants of India; to the extent these are found to be relevant and applicable.

vi. In our opinion, company has adequate system of internal audit of cost records which to our opinion is commensurate to its nature and size of its business.

vii. Detailed unit-wise and product-wise cost statements and schedules thereto in respect of the product groups under reference of the company duly audited and certified by us are kept in the company.

2. Observations and suggestions, if any, of the Cost Auditor, relevant to the cost audit.

(a) The Cost Accounting Records of the company have been maintained in accordance with CRA-1 of the Rules and are also in conformity with the generally accepted cost accounting principles and cost accounting standards issued by the institute of Cost Accountants of India to the extent these are found to be relevant and applicable. There has been no change in the system of cost accounting during the year under review and the same is being followed consistently by the company.

(b) The annexures to the Cost Audit Report from Part A to D are integral part of this report.

(c) The Available Capacity shown in Part B-1 in respect of the different Products, wherever applicable, is as certified by the management.

(d) Normal Price and basis adopted to determine the normal price are as certified by the Management.

(e) The non-cost revenue and the expenses for the period have been disclosed in the reconciliation of profit/loss para after discussion with the management.

Management's Responsibility for the Cost Records

The Company is responsible for preparation of the Cost Records that give a true and fair view of the Cost Sheets & Annexures to the Cost Audit Report in accordance with the Generally Accepted Cost Accounting Principles and the cost records as per the Companies (Cost Records & Audit) Rules, 2014 read with its amendments. This responsibility also includes maintenance of adequate cost accounting records in accordance with the provisions of the Act and the Rules for preventing and detecting frauds and other irregularities; selection and application of appropriate Cost accounting policies; making judgements and estimates that are reasonable and prudent; and design, Implementation and maintenance of adequate internal financial controls, relevant to the preparation and presentation of the Annexures to the Cost Audit Report that give a true and fair view and are free from material misstatements, whether due to fraud or error.

Auditors Responsibility

Our responsibility is to express an opinion on these Cost Records based on our audit. We have taken into consideration the signed standalone financial statements provided to us by the management, the provisions of the Act, The Cost Accounting and Auditing Standards and the matters which are required to be included in the Cost Audit Report under the provisions of the Act and Rules made thereunder. We have conducted our audit in accordance with the Standards on Cost Auditing as specified under section 148(3) of the Act. Those Standards required that we comply with the ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the cost records are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the cost records. The procedures selected depend on the auditor's judgement, including the assessment of risks of material misstatement of the cost records, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the Company's preparation of the cost records that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for expressing an opinion on whether the company has in place an adequate internal financial controls system and the operating effectiveness of such controls.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion on the cost records and in accordance with the rules and processes laid by MERC, appropriate samples were randomly selected, opinion & explanations were seeked from the respective managements wherever required.

Disclosures

i. The Management, executives, staff, members, etc. gave the audit team their full co-operation in conducting the cost audit.

ii. All facts mentioned in this report were discussed, deliberated, consulted, etc. with the management, wherever deemed fit, the opinions and suggestions have been incorporated satisfactorily, the said report is well within the knowledge and due notice of the management.

iii. Annexures to Cost Audit Report is the responsibility of the Company's Management. This responsibility also includes maintenance of adequate cost accounting records in accordance with the provisions of the Act and the Rules for preventing and detecting frauds and other irregularities; selection and application of appropriate Cost accounting policies; making judgements and estimates that are reasonable and prudent; and design, Implementation and maintenance of adequate internal financial controls, relevant to the preparation and presentation of the Annexures to the Cost Audit Report that give a true and fair view and are free from material misstatements, whether due to fraud or error. Our audit includes examining, on a test basis, evidence supporting these statements to verify that these statements are free of material misstatement. Our Observations and suggestions are based on the information contained in these Statements.

iv. In our opinion, the Cost Accounting Records are in conformity with the Cost Accounting Standardsissued by The Institute of Cost Accountants of India to the extent these are found to be relevant and applicable. The Cost Auditing Standards have not been notified by the competent authority on the date of this report and as such the compliance thereof is not applicable.

v. The Cost Records and Annexures to the Cost Audit Report are based on financial accounts approved by the Competent Authority of the company.

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Yadav
Sr. Partner
Membership No. 30106

Dated : 31-10-2024
Place : Mumbai
UDIN : 2430106ZZORKRQ85MG

3. **Cost Accounting Policy**

1) **Briefly describe the cost accounting policy adopted by the Company and its adequacy or otherwise to determine correctly the cost of production/operation, cost of sales, sales realization and margin of the product(s)/service(s) under reference separately for each product(s)/service(s). The policy shall cover, inter alia, the following areas:**

Cost accounting policy adopted by the Company keeping in view the requirements of the Companies (Cost Records and Audit) amendment (Rules),2014 and also the Cost Auditing Standards, under Section 148 (3) of the Companies Act 2013.

Cost records are prepared to conform with CRA 1 guidelines of Companies (Cost Records and Audit) amendment (Rules) 2014 and Cost Accounting Standards issued by The Institute of Cost Accountants of India.

a) **Identification of cost centres/ cost objects and cost drivers**: -

The company has accounting system with cost centers, cost object & cost drivers are properly identified for the product. Each site is a cost centre with activities like procurement, stores, quality control, etc. The product acts as the primary cost objects to which all cost are ultimately assigned and allocated.

b) **Accounting for material cost including packing materials, stores and spares etc., employee cost, utilities and other relevant cost components**: -

i. **Material Cost**: -

Material receipts are valued at purchase price, including duties and taxes (net of credits), freight inward, insurance and other expenses directly attributable to the same. The material cost are assigned to products based on consumption of inputs.

ii. **Packing Cost**: -

Not applicable.

iii. **Employee Cost**: -

The employee cost has been calculated as per Cost Accounting Standard 7. Aggregate value of all kinds of consideration paid & payable has been considered properly. Employee cost is traced to specific cost centre depending on the department of the employee. Cost centre wise employee cost is allocated over the products depending upon the nature of each cost centre.

iv. **Utilities**: -

Utilities cost include cost of power for auxiliary consumption has been considered in cost of utilities and loaded to the cost centres based on the actual consumptions. The cost of utility has been treated as distinct cost object as per Cost Accounting Standard 8.

c) **Accounting, allocation and absorption of overheads**: -

Administrative overheads are apportioned based on aggregate of employees cost, office rent, travelling expenses of each production cost centres. Apportionment of all overheads is made to various cost centres. The overheads are apportioned as per Cost Accounting standard 3 & 11.

d) **Accounting for Depreciation/ Amortization**: -

Depreciation of various plants & machinery, building and other equipments has been accounted for the product cost centre. Depreciation is provided on straight-line method. The estimated life of the assets is based on the MERC Regulation 2019.The rates of depreciation on various class of assets and the policy for calculation of depreciation is as per the MERC Regulation 2019

e) **Accounting for by-products/ joint-products, scraps, wastage etc.**: -

Wastage/scrap derived during manufacturing process is accounted for product cost centre through the accounting system.

f) **Basis for Inventory Valuation**: -

Not applicable.

g) **Methodology for valuation of Inter-Unit/Inter Company and Related Party transactions: -**

There are related party transactions during the year. The Company use cost plus method for valuation of related party transaction.

h) **Treatment of abnormal and non-recurring costs including classification of other non-cost items**: -

Abnormal, non-recurring costs and other non-cost items are shown under reconciliation of financial accounting profits and costing accounting profits in the report. Abnormal/Non-recurring costs are not considered for product costing.

i) **Other relevant cost accounting policy adopted by the Company**: -

Nil.

2) **Briefly specify the changes, if any, made in the cost accounting policy for the product(s)/service(s) under audit during the current financial year as compared to the previous financial year**: -

No such changes in the current financial year.

3) **Observations of the Cost Auditor regarding adequacy or otherwise of the Budgetary Control System, if any, followed by the company**: -

Budgetary control system prevalent in the company is considered adequate, taking into account the size of the Company and the nature of its operations.

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2023 to 31st March 2024

	GENERAL INFORMATION	
1	Corporate identity number or foreign company registration number	N.A.
2	Name of company/undertaking	The Brihan Mumbai Electric Supply & Transport Undertaking
3	Address of registered office or of principal place of business in India of company	BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001
4	Address of corporate office of company	BEST Bhavan, BEST Marg, Mumbai, Maharashtra- 400 001
5	Email address of company	accounts@bestundertaking.com
6	Date of start of reporting period	01-04-2023
7	Date of end of reporting period	31-03-2024
8	Date of start of first previous financial year	01-04-2022
9	Date of end of first previous financial year	31-03-2023
10	Level of rounding used in cost statements	in Lakh
11	Reporting currency of entity	INR
12	Number of cost auditor(s) for reporting period	1
13	Date of board of directors' meeting in which annexure to cost audit report was approved	N.A.
14	Whether cost auditors report has been qualified or has any reservations or contains adverse remarks	No
15	Consolidated qualifications, reservations or adverse remarks of all cost auditors [text block]	As Per CRA-3
16	Consolidated observations or suggestions of all cost auditors	As Per CRA-3
17	Whether company has related party transactions for sale or purchase of goods or services	N.A.

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply &
Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : CAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking		
1st April 2023 to 31st March 2024		
GENERAL DETAILS OF COST AUDITOR		
1	Whether cost auditor is lead auditor	Yes
2	Category of cost auditor	Firm
3	Firm's registration number	101561
4	Name of cost auditor or cost auditors firm	Jitendrakumar & Associates
5	Permanent account number of cost auditor or cost auditors firm	AAMFJ2611C
6	Address of cost auditor or cost auditors firm	708A, P.J. Tower, 7th Floor, BSE, Dalal Street, Fort, Mumbai, 400 001,
7	Email id of cost auditor or cost auditors firm	jitendrakumarassociates@gmail.com.
8	Membership number of member signing report	30106
9	Name of member signing report	Jitendrakumar Rambaran Yadav
10	Name of product or services with CETA HEADING	Transmission & Distribution of Electricity
11	SRN number of Form 23C/CRA 2	N.A
12	Number of audit committee meeting attended by cost auditor during year	N.A
13	Date of signing cost audit report and annexure by cost auditor	31-10-2024
14	Place of signing cost audit report and annexure by cost auditor	Mumbai

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply
& Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE.
Designation : CAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2023 to 31st March 2024

4. Product / Service Details (for the company as a whole)

SrNo	Name of Product / Service	UOM	CETA	Covered under Audit or Not	Whether Previous Fig Reported or not	Net Opertional Revenue CURRENT YEAR	PREVIOUS YEAR
	Service Provided:-						
1	Transmission & Distribution of Electricity		N.A	YES	YES	4,26,608	3,60,190
3	Sale of Scrap			No	No	1,214	607
	Total Net Revenue from Operations					**4,27,822**	**3,60,797**
	Other Incomes of Company					6,460	8,179
	Other Operating Incomes of Company (Past Revenue Shortfall/(Surplus)					-	-
	Total Revenue as per Financial Accounts					**4,34,282**	**3,68,976**
	Extra Ordinary Income, If any					-	-
	Past Revenue Shortfall/(Surplus)						
	Total Revenue including extra ordinary Income, If any					4,34,282	3,68,976
	Turnover as per GST						

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport

Authorised Signatory
Name : ANAND MAHADEO SAKHARE.
Designation : CAO&FA(Delegation)

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
1st April 2023 to 31st March 2024

QUANTITATIVE INFORMATION (for each product ceta separately)				
	4 Digit Ceta code	N.A		
	Service Name	Transmission or Distribution of Electricity		
	FINANCIAL YEAR :	2023-24		
	PARTICULARS	UOM	Current Year	Previous Year
	1. AVAILABLE CAPACITY:			
a)	Installed Capacity	Lacs	N.A	N.A
b)	Capacity Enhanced During the Year	Lacs	N.A	N.A
c)	Capacity available through leasing arrangements, if	Lacs	N.A	N.A
d)	Capacity available through loan license/ third parties	Lacs	N.A	N.A
e)	**Total available capacity**	Lacs	N.A	N.A
	2. Actual Production:			
a)	Self Manufactured	Lacs	N.A	N.A
b)	Produced under leasing arrangements	Lacs	N.A	N.A
c)	Produced on loan license/ by third parties on job work	Lacs	N.A	N.A
d)	**Total Production**	Lacs	N.A	N.A
	3.Production as per Excise Records:	Lacs	N.A	N.A
	4. Capacity utilisation (In House)	Lacs	N.A	N.A
	5.Finished Goods Purchased			
a)	Domestic purchase	Lacs	51,120.23	48,363.17
b)	Imports			
c)	**Total Finished Goods Purchased**	Lacs	**51,120.23**	**48,363.17**
	6. Stock & Other Adjustments:			
a)	Change in Stock of Finished Goods	Lacs	N.A	N.A
b)	Self / Captive Consumption (incl. samples etc.)	Lacs	N.A	N.A
c)	Other Quantitative Adjustments, if any (Wastage. Etc.)	Lacs	3,718.72	3,530.00
d)	**Total Adjustments**	Lacs	N.A	N.A
	7. Total Available Quantity for sale { 2[d] + 5[c] + 6[d]} :-	Lacs	**47,401.51**	**44,833.17**
	8. Actual Sales:			
a)	Domestic Sales(Manufacturing)	Lacs	N.A	N.A
b)	Domestic Sales(Trading)	Lacs	47,401.51	44,833.17
c)	Export Sales(Manufacturing)	Lacs	N.A	N.A
d)	Export Sales (Trading)	Lacs	N.A	N.A
e)	**Total Quantity Sold**	Lacs	**47,401.51**	**44,833.17**

Note Distribution loss for FY 2023-24 is considered 4.12% & Transmission Loss for FY 2023-24 is 2.91%

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply &
Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SHAKHARE.
Designation : CAO&FA(Delegation)

1st April 2023 to 31st March 2024					

2. ABRIDGED COST STATEMENT.

Sr	Name of the Service			Transmission or Distribution of Electricity			
	CETA Heading			NA			
	UOM			Lacs			
	Production		FG Purchased	Finished Stock Adjustments	Captive consumption	Other Adjustments	Quantity Sold
	CURRENT YEAR		51,120.23	-	-	3,718.72	47,401.51
	PREVIOUS YEAR		48,363.17	-	-	3,530.00	44,833.17

Sr	Description	CURRENT YEAR Amount	CURRENT YEAR Rate/unit	PREVIOUS YEAR Amount	PREVIOUS YEAR Rate/unit
1	Cost of materials consumed				
2	Cost of process materials or chemicals consumed				
3	Cost of utilities consumed				
4	Cost of direct employees				
5	Cost of direct expenses				
6	Cost of stores and spares consumed				
7	Cost of repairs and maintenance	56,850	1.11	52,403	1.08
8	Cost of quality control	201	0.004	197	0.004
9	Cost of research and development	2,532	0.05	2,519	0.05
10	Cost of technical knowhow fee or royalty		-		-
11	Cost of depreciation or amortization	11,304	0.22	10,929	0.23
12	Cost of other production overheads	75	0.001	67	0.001
13	Cost of industry specific operating expenses		-		-
14	**Total of inputs and conversion cost**	70,962	1.39	66,115	1.37
15	Cost of increase/decrease in work-in-progress				
16	Credits for recoveries				
17	Cost of primary packing				
18	**Cost of production or operations**	70,962	1.39	66,115	1.37
19	Cost of finished goods purchased	3,18,241	6.23	3,78,736	7.831
20	**Total cost of production and purchases**	3,89,203	7.61	4,44,851	9.20
21	Cost of increase/decrease in finished goods				
22	Cost of self or captive consumption				
23	Cost of other adjustments				
24	**Cost of production or operations of goods or services so**	3,89,203	7.61	4,44,851	9.20
25	Cost of administrative overheads	8,094	0.17	9,116	0.20
26	Cost of secondary packing				
27	Cost of selling and distribution overheads	6,048	0.13	3,924	0.088
28	**Cost of sales before Interest**	4,03,345	8.51	4,57,891	10.21
29	Cost of interest and financing charges	17,515	0.37	11,923	0.27
30	**Cost of sales of product or activity group**	**4,20,859**	**8.88**	**4,69,814**	**10.48**
31	**Net sales realization of product or activity group**	**4,27,822**	**9.03**	**3,60,797**	**8.05**
32	**Amount of margin as per cost accounts**	**6,962**	**0.15**	**(1,09,017)**	**(2.43)**

For Jitendrakumar & Associates
Cost Accountants

JITENDRAKUMAR & ASSOCIATES FRN 1567 COST ACCOUNTANTS MUMBAI

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : GAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2023 to 31st March 2024

1. PRODUCT AND SERVICE PROFITABILITY STATEMENT (for audited products/services)							
Sr No	Particulars	Current Year			Previous Year		
		Sales	Cost of sales	Margin	Sales	Cost of sales	Margin
1	Transmission & Distribution of Electricity	4,27,822	4,20,859	6,962	3,60,797	4,69,814	(1,09,017)
	Total	4,27,822	4,20,859	6,962	3,60,797	4,69,814	(1,09,017)

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : CAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking 1st April 2023 to 31st March 2024			
	2. PROFIT RECONCILIATION (for the company as a whole)		
Sr no	Particulars	Current Year	Previous Year
1	**Profit/loss as per Cost Accounting Records**	**6,962**	**(1,09,017)**
	(a) For the Audited Product(s) /service(s)	6,962	(1,09,017)
	(b) For the Un-audited Product(s) /service(s)		
2	**Add: Incomes not considered in Cost accounts (specify details)**	**6,460**	**8,179**
	Bank Deposits	68	55
	Rent of building & Land	399	629
	E.D. Collection & DP Chgs	3,833	3,916
	Profit on sale of assets'	984	984
	Misc Income	10	20
	Discount, Sundry balance Written Back	437	2,337
	Advertisement Receipts	729	238
3	**Less: Expenses not considered in cost accounts (specify details)**	**5,190**	**8,146**
	HIRING OF REFRIGERATOR & OTHER	0	0
	ELECTRICAL APPLIANCE ON HIRE	0	0
	CLEANING AND DISINFECTING -Corona	12	15
	CLEANING & DISINFECTING DEPART	0	0
	BAD DEBTS	660	565
	OTHER EXPENDITURE	897	583
	STOCK ADJUSTMENT	3	1
	CELEBRATION OF REPUBLIC DAY /	0	0
	MAHAPARINIRVAN DAY	3	3
	WEATHER FORECAST PROVIDER	-	-
	PROVISION FOR OBSOLESCENCE	4	4
	STREET LIGHTING EXPENSE	3,608	6,974
	ELECT. SUPPLY CONTIN. RESERVE	-	-
4	**Diffrence in Valuation of stock between financial accounts and cost accounts**		
5	**Profit or Loss as per Financial Accounts**	**8,233**	**(1,08,984)**

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric
Supply & Transport
Undertaking

Authorised Signatory
Name : ANAND MAHADEO SARMARE
Designation : CAO&FA(Delegation)

The Brihan Mumbai Electric Supply & Transport Undertaking
1st April 2023 to 31st March 2024

Sr. No.	Particulars	Current Year Rs.	Previous Year Rs.
3.VALUE ADDITION AND DISTRIBUTION OF EARNING (for the company as a whole)			
	Value Addition:		
1	Gross Sales (excluding sales returns)	4,34,282	3,68,976
2	Less: Excise Duty,etc.		
3	Net Sales	4,34,282	3,68,976
4	Add: Export Incentives		
5	Add/Less: Adjustments in finished stocks		
6	Less: Cost of bought out inputs		
	(a)Cost of Materials Consumed		
	(b)Process Materials / Chemicals		
	(c)Consumption of Stores & Spares		
	(d)Utilities (e.g. power & fuel)		
	(e)Others,if any (specify PURCHASE OF POWER & RELATED MATERIAL)	3,16,641	3,77,499
	Total Cost of bought out inputs	**3,16,641**	**3,77,499**
7	**Value Added**	**1,17,641**	**(8,523)**
8	Add:Income from Other sources	-	-
9	Add:Extra ordinery Income		
10	**Earnings available for distribution**	**1,17,641**	**(8,523)**
	Distribution of Earnings to:		
1	Employees as salaries & wages, retirement benefits, etc.	58,468	59,533
2	Shareholders as dividend	-	
3	Company as retained funds	19,537	(98,055)
4	Government as taxes	-	
5	Extra ordinery Expenses	-	
6	Others, if any (specify)	39,636	50,664
7	**Total distribution of earnings**	**1,17,641**	**12,142**

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply
& Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE.
Designation : SAO&FA(Delegation)

4.FINANCIAL POSITION AND RATIO ANALYSIS (for the company as a whole)

	Particulars	Units	Current Year	Previous Year
A.	**Financial Position**			
1	Share Capital			
2	Reserves & Surplus		4,83,379	4,66,672
3	Long Term Borrowings		1,88,450	2,14,891
4	(a) Gross Assets		10,25,726	10,22,792
	(b) Net Non-Current Assets		1,66,911	1,65,076
5	(a) Current Assets		8,44,351	8,42,756
	(b) Less: Current Liabilities		2,97,265	2,88,057
	(c) Net Current Assets		5,47,087	5,54,699
6	Capital Employed		4,83,379	4,66,672
7	Net Worth		4,83,379	4,66,672
B.	**Financial Performance**			
1	Value added		1,17,641	(8,523)
2	Net Revenue from Operations of Company		4,34,282	3,68,976
3	Profit before Tax (PBT)		8,233	(1,08,984)
C.	**Profitability Ratios**			
1	PBT to Capital Employed (B3/A6)	%	1.70%	-23%
2	PBT to Net Worth (B3/A7)	%	1.70%	-23%
3	PBT to Value Added (B3/B4)	%	7.00%	1279%
4	PBT to Net revenue from operations (B3/B2)	%	2%	-30%
D.	**Other Financial Ratios**			
1	Debt-Equity Ratio		0.39	0.46
2	Current Assets to Current Liabilities		2.84	2.93
3	Valued Added to Net Revenue from Operations	%	27%	-2%
E.	**Working Capital Ratios**			
1	Raw Materials Stock to Consumption	month	NA	NA
2	Stores & Spares to Consumption	month	N.A	NA

For Jitendrakumar & Associates
Cost Accountants

FCMA Jitendrakumar Rambaran Yadav
Sr. Partner
Membership No: 30106

Date : - 31-10-2024
Place:- Mumbai

For and On Behalf of
The Brihan Mumbai Electric Supply & Transport Undertaking

Authorised Signatory
Name : ANAND MAHADEO SAKHARE
Designation : CAO&FA(Delegation)

Annexure 7

MAHATRANSCO
Maharashtra State Electricity Transmission Co. Ltd.

MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO.LTD.
CIN NO. U40109MH2005SGC153646
Maharashtra State Load Dispatch Center
Tele :91-22-27601765/1766/1931/2937 Office of The Chief Engineer
Fax :91-22-27601769/2936 Maharashtra State Load Dispatch Center
Email : cesldc@mahasldc.in Thane-Belapur Road, P.O. Airoli
website : http://www.mahasldc.in Navi Mumbai Pin – 400 708.

RIGHT TO INFORMATIO

Ref: CE/MSLDC/EA/ No 0 0 9 9 6 Date: 0 9 JUN 2023

To,

The General Manager (REC , RPO, R&D),
Maharashtra Energy Development Agency
Government of Maharashtra
Aundh Road, Opposite Spicer College,
Near Commissionerate of Animal Husbandry, Pune 411067
(Maharashtra), INDIA

Sub: Submission of Gross Energy consumption (GEC) data of utilities for the financial year 2022-2023.

Dear Sir,

With reference to the above subject please find enclosed herewith Revised Gross Energy consumption (GEC) data of utilities for the financial year 2022-2023.

Submitted for your kind information and needful please.

Yours Faithfully,

ENCL : As above.

(Mahesh Bhagwat)
Chief Engineer
MSLDC, Airoli

MAHARASHTRA STATE LOAD DISPATCH CENTRE

Utility wise Gross Energy Consumption Data FY 2022-23

Month	MSEDCL			TATA Power		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-22	14,52,57,22,987	3.43	15,04,16,51,638	35,56,35,279	3.43	36,82,66,831
May-22	14,50,62,93,105	3.26	14,99,51,34,489	36,64,73,214	3.26	37,88,22,839
Jun-22	12,63,25,61,296	3.29	13,06,23,11,339	35,03,67,006	3.29	36,22,86,223
Jul-22	10,84,22,90,524	3.47	11,23,20,42,395	34,28,70,252	3.47	35,51,95,537
Aug-22	11,36,31,18,612	3.21	11,73,99,71,704	34,29,12,970	3.21	35,42,85,536
Sep-22	10,89,41,63,927	3.32	11,26,82,70,508	33,74,26,421	3.32	34,90,13,675
Oct-22	10,96,02,81,962	3.00	11,29,92,59,755	34,12,52,130	3.00	35,18,06,320
Nov-22	12,42,89,18,682	3.20	12,83,97,92,027	32,56,17,388	3.20	33,63,81,599
Dec-22	13,47,90,15,057	3.13	13,91,45,40,164	34,35,64,308	3.13	35,46,65,333
Jan-23	13,58,65,08,989	3.12	14,02,40,59,650	31,30,80,687	3.12	32,31,63,385
Feb-23	13,01,23,22,814	3.43	13,47,44,98,099	30,45,58,060	3.43	31,53,75,438
Mar-23	14,30,08,84,762	3.23	14,77,82,21,310	35,37,40,103	3.23	36,55,47,280
Total	1,52,53,20,82,717		1,57,66,97,53,078	4,07,74,97,818		4,21,48,09,994

Month	AEML (FORMERLY R-Infra)			BEST		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-22	1,09,44,87,245	3.43	1,13,33,61,546	44,18,83,164	3.43	45,75,78,093
May-22	1,15,51,68,439	3.26	1,19,40,95,968	46,35,30,626	3.26	47,91,50,947
Jun-22	1,04,67,58,808	3.29	1,08,23,68,740	42,51,99,934	3.29	43,96,64,910
Jul-22	94,59,74,640	3.47	97,99,79,944	38,85,25,073	3.47	40,24,91,529
Aug-22	95,66,78,909	3.21	98,84,06,766	39,13,07,195	3.21	40,42,84,735
Sep-22	94,69,70,190	3.32	97,94,89,233	39,02,54,871	3.32	40,36,56,259
Oct-22	98,26,87,449	3.00	1,01,30,79,844	40,32,09,071	3.00	41,56,79,455
Nov-22	88,81,63,360	3.20	91,75,24,132	36,73,92,652	3.20	37,95,37,864
Dec-22	90,29,29,263	3.13	93,21,04,122	37,05,87,610	3.13	38,25,61,794
Jan-23	76,35,21,625	3.12	78,81,10,678	31,08,81,873	3.12	32,08,93,758
Feb-23	81,06,96,006	3.43	83,94,90,531	32,50,22,233	3.43	33,65,66,463
Mar-23	99,74,80,433	3.23	1,03,07,74,448	40,08,81,298	3.23	41,42,61,959
Total	11,49,15,16,367		11,87,87,85,951	4,67,86,75,600		4,83,63,27,764

Month	Railways			NIDAR SEZ		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-22	24,92,80,057	3.43	25,81,34,055	20,44,533	3.43	21,17,151
May-22	26,13,88,406	3.26	27,01,96,822	21,45,850	3.26	22,18,162
Jun-22	25,03,55,413	3.29	25,88,72,312	20,17,723	3.29	20,86,364
Jul-22	25,15,16,860	3.47	26,05,58,231	20,18,022	3.47	20,90,565
Aug-22	25,18,11,361	3.21	26,01,62,580	21,29,500	3.21	22,00,124
Sep-22	25,31,92,660	3.32	26,18,87,319	20,90,364	3.32	21,62,147
Oct-22	26,76,17,702	3.00	27,58,94,538	21,33,323	3.00	21,99,302
Nov-22	26,30,61,647	3.20	27,17,57,900	20,82,729	3.20	21,51,580
Dec-22	27,90,19,512	3.13	28,80,35,008	22,15,584	3.13	22,87,172
Jan-23	28,37,54,434	3.12	29,28,92,686	22,08,210	3.12	22,79,325
Feb-23	25,59,07,795	3.43	26,49,97,199	21,17,070	3.43	21,92,265
Mar-23	28,60,11,315	3.23	29,55,57,833	25,08,011	3.23	25,91,724
Total	3,15,29,17,162		3,25,89,46,482	2,57,10,919		2,65,75,881

Superintending Engineer (EA), MSETCL, MSLDC, Airoli

	MBPPPL SEZ- started from 9 April 15			KRC- started in June 2019 -deemed distr. Licensee		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-22	43,91,393	3.43	45,47,368	18,27,398	3.43	18,92,304
May-22	50,23,924	3.26	51,93,223	20,68,177	3.26	21,37,872
Jun-22	48,02,950	3.29	49,66,343	20,07,859	3.29	20,76,165
Jul-22	44,13,352	3.47	45,72,000	18,90,896	3.47	19,58,869
Aug-22	45,71,702	3.21	47,23,321	19,67,772	3.21	20,33,032
Sep-22	44,74,235	3.32	46,27,881	19,64,839	3.32	20,32,312
Oct-22	44,74,014	3.00	46,12,386	18,78,616	3.00	19,36,718
Nov-22	43,31,775	3.20	44,74,974	18,20,698	3.20	18,80,886
Dec-22	44,38,370	3.13	45,81,780	18,78,034	3.13	19,38,716
Jan-23	41,33,614	3.12	42,66,736	18,37,321	3.12	18,96,492
Feb-23	40,50,397	3.43	41,94,260	17,46,113	3.43	18,08,132
Mar-23	47,21,370	3.23	48,78,960	20,06,043	3.23	20,73,001
Total	5,38,27,096		5,56,39,231	2,28,93,766		2,36,64,497

	GIGAPLEX - started 19 april 16			Laxmipati Balaji started 02/02/2021		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-22	22,09,775	3.43	22,88,262	3,06,911	3.43	3,17,812
May-22	25,25,234	3.26	26,10,331	3,46,119	3.26	3,57,783
Jun-22	25,66,138	3.29	26,53,436	3,08,917	3.29	3,19,426
Jul-22	24,34,352	3.47	25,21,861	2,79,490	3.47	2,89,537
Aug-22	24,96,368	3.21	25,79,159	2,85,532	3.21	2,95,002
Sep-22	25,18,156	3.32	26,04,630	3,09,239	3.32	3,19,858
Oct-22	25,70,210	3.00	26,49,701	2,96,337	3.00	3,05,502
Nov-22	22,03,535	3.20	22,76,379	2,65,680	3.20	2,74,463
Dec-22	20,30,069	3.13	20,95,663	2,42,912	3.13	2,50,761
Jan-23	19,01,364	3.12	19,62,597	2,35,714	3.12	2,43,305
Feb-23	18,87,887	3.43	19,54,941	2,31,900	3.43	2,40,137
Mar-23	22,07,098	3.23	22,80,767	2,86,042	3.23	2,95,590
Total	2,75,50,186		2,84,77,727	33,94,793		35,09,175

	EON Khardi Phase I-started 06/11/2020			EON Khardi Phase II-started 05/03/2021		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-22	23,52,685	3.43	24,36,248	18,14,472	3.43	18,78,919
May-22	27,33,975	3.26	28,26,106	20,18,341	3.26	20,86,356
Jun-22	25,53,767	3.29	26,40,644	22,31,230	3.29	23,07,135
Jul-22	27,33,836	3.47	28,32,110	18,62,381	3.47	19,29,329
Aug-22	25,88,895	3.21	26,74,755	19,33,165	3.21	19,97,278
Sep-22	21,37,637	3.32	22,11,044	19,56,867	3.32	20,24,066
Oct-22	24,90,127	3.00	25,67,141	18,82,164	3.00	19,40,375
Nov-22	23,05,773	3.20	23,81,997	18,48,021	3.20	19,09,113
Dec-22	23,80,697	3.13	24,57,621	19,43,743	3.13	20,06,548
Jan-23	22,62,117	3.12	23,34,968	15,10,707	3.12	15,59,359
Feb-23	21,78,771	3.43	22,56,157	19,17,048	3.43	19,85,138
Mar-23	24,28,171	3.23	25,09,219	23,74,345	3.23	24,53,596
Total	2,91,46,451		3,01,28,010	2,32,92,484		31,19,531

Superintending Engineer (EA)
MSETCL, MSLDC, Airoli

	JNPT started 06/07/2021			MADC		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-22	3,09,795	3.43	3,20,798	65,68,557	3.43	68,01,861
May-22	3,28,079	3.26	3,39,135	74,31,297	3.26	76,81,721
Jun-22	3,63,021	3.29	3,75,371	70,35,289	3.29	72,74,624
Jul-22	3,70,311	3.47	3,83,623	67,92,890	3.47	70,37,077
Aug-22	3,76,584	3.21	3,89,073	66,12,588	3.21	68,31,892
Sep-22	3,83,676	3.32	3,96,851	64,98,956	3.32	67,22,131
Oct-22	4,17,210	3.00	4,30,113	60,06,246	3.00	61,92,006
Nov-22	4,68,380	3.20	4,83,864	53,88,874	3.20	55,67,019
Dec-22	4,52,548	3.13	4,67,170	56,14,641	3.13	57,96,058
Jan-23	4,03,078	3.12	4,16,059	55,19,288	3.12	56,97,036
Feb-23	4,03,701	3.43	4,18,040	52,53,631	3.43	54,40,231
Mar-23	5,03,598	3.23	5,20,407	63,18,536	3.23	65,29,437
Total	47,79,981		49,40,505	7,50,40,793		7,75,71,091

Superintending Engineer (EA)
MSETCL, MSLDC, Airoli

MAHATRANSCO
Maharashtra State Electricity Transmission Co. Ltd
MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO.LTD.
CIN NO. U40109MH2005SGC153646
Maharashtra State Load Dispatch Center
Tele :91-022-27601762 (P)
91-022-27601931 (O) Extn.1003
Office of The Chief Engineer
Maharashtra State Load Dispatch Center
Email : cesldc@mahasldc.in
website : www.mahasldc.in
Thane-Belapur Road, P.O. Airoli
Navi Mumbai Pin – 400 708.
RIGHT TO INFORMATION

Ref: CE/MSLDC/EA/ No 0 0 9 7 4 Date: 21 MAY 2024

To.

The General Manager (REC , RPO. R&D).
Maharashtra Energy Development Agency
Government of Maharashtra
Aundh Road, Opposite Spicer College.
Near Commissionerate of Animal Husbandry. Pune 411067
(Maharashtra). INDIA

Sub: Submission of Gross Energy consumption (GEC) data of utilities for of the financial year 2023-2024.

Dear Sir,

With reference to the above subject please find enclosed herewith Revised Gross Energy consumption (GEC) data of utilities for the financial year 2023-2024.

Submitted for your kind information and needful please.

Yours Faithfully,

21/05/24

(Mahesh Bhagwat)
Chief Engineer
MSLDC, Airoli

ENCL : As above.

MAHARASHTRA STATE LOAD DISPATCH CENTRE

Utility wise Gross Energy Consumption Data FY 2023-24

Month	MSEDCL			TATA Power		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	14,22,27,62,225	3.71	14,77,07,57,322	36,58,98,782	3.71	37,99,96,658
May-23	14,72,45,48,252	3.56	15,26,80,92,339	39,31,32,796	3.56	40,76,44,956
Jun-23	14,19,59,36,134	3.42	14,69,86,29,255	37,27,99,133	3.42	38,60,00,345
Jul-23	12,22,55,84,805	3.24	12,63,49,57,425	36,54,58,646	3.24	37,76,95,996
Aug-23	13,45,63,79,846	3.22	13,90,40,91,595	35,17,95,655	3.22	36,35,00,367
Sep-23	12,81,99,81,641	3.28	13,25,47,37,015	34,44,19,770	3.28	35,60,99,845
Oct-23	14,67,89,06,814	3.53	15,21,60,32,770	37,47,39,263	3.53	38,84,51,605
Nov-23	13,65,50,72,908	3.17	14,10,21,09,788	34,67,95,407	3.17	35,81,48,721
Dec-23	13,17,41,66,378	2.94	13,57,32,19,018	36,61,09,151	2.94	37,71,98,796
Jan-24	14,13,36,33,853	2.84	14,54,67,61,890	35,65,40,608	2.84	36,69,62,338
Feb-24	13,87,30,21,917	3.07	14,31,24,12,996	33,55,60,381	3.07	34,61,88,364
Mar-24	15,24,63,46,173	3.21	15,75,19,84,888	36,85,28,652	3.21	38,07,50,751
Total	1,66,40,63,40,945		1,72,03,37,86,302	4,34,17,78,244		4,48,86,38,742

Month	AEML (FORMERLY R-Infra)			BEST		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	1,07,88,99,711	3.71	1,12,04,69,115	42,68,31,023	3.71	44,32,76,584
May-23	1,18,78,93,355	3.56	1,23,17,43,421	47,16,46,674	3.56	48,90,57,107
Jun-23	1,17,19,33,215	3.42	1,21,34,32,610	46,80,31,968	3.42	48,46,05,475
Jul-23	98,45,81,291	3.24	1,01,75,49,908	40,11,83,747	3.24	41,46,17,349
Aug-23	1,04,22,92,971	3.22	1,07,69,71,452	42,09,16,200	3.22	43,49,20,645
Sep-23	1,02,12,60,352	3.28	1,05,58,93,664	41,15,49,235	3.28	42,55,05,826
Oct-23	1,16,48,15,848	3.53	1,20,74,38,425	46,05,21,261	3.53	47,73,72,511
Nov-23	1,00,28,08,998	3.17	1,03,56,38,746	41,25,67,610	3.17	42,60,74,161
Dec-23	92,71,73,469	2.94	95,52,58,056	38,24,45,156	2.94	39,40,29,627
Jan-24	86,40,64,907	2.84	88,93,21,642	35,35,69,472	2.84	36,39,04,356
Feb-24	84,04,85,463	3.07	86,71,05,605	34,11,27,089	3.07	35,19,31,382
Mar-24	98,81,94,157	3.21	1,02,09,67,204	39,36,72,117	3.21	40,67,28,089
Total	12,27,44,03,737		12,69,17,89,848	4,94,40,61,552		5,11,20,23,112

Month	Railways			NIDAR SEZ		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	28,50,96,569	3.71	29,60,81,181	26,34,276	3.71	27,35,773
May-23	29,75,77,140	3.56	30,85,61,945	29,14,745	3.56	30,22,340
Jun-23	28,40,53,577	3.42	29,41,12,215	28,18,114	3.42	29,17,906
Jul-23	27,22,86,743	3.24	28,14,04,240	28,30,047	3.24	29,24,811
Aug-23	28,92,37,067	3.22	29,88,60,371	33,01,755	3.22	34,11,609
Sep-23	28,10,77,727	3.28	29,06,09,726	33,10,718	3.28	34,22,992
Oct-23	29,70,94,440	3.53	30,79,65,627	36,24,449	3.53	37,57,074
Nov-23	29,47,48,321	3.17	30,43,97,729	34,71,640	3.17	35,85,294
Dec-23	30,26,08,069	2.94	31,17,74,231	35,98,926	2.94	37,07,939
Jan-24	30,36,44,861	2.84	31,25,20,442	36,45,703	2.84	37,52,267
Feb-24	29,03,36,943	3.07	29,95,32,594	34,58,955	3.07	35,68,508
Mar-24	32,01,18,493	3.21	33,07,35,089	38,50,585	3.21	39,78,288
Total	3,51,78,79,950		3,63,65,55,390	3,94,59,913		4,07,84,802

S.E(EA)

Superintending Engineer (EA)
MSETCL, MSLDC, Airoli

	MBPPPL SEZ			KRC		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	49,12,107	3.71	51,01,368	20,41,177	3.71	21,19,822
May-23	54,99,172	3.56	57,02,169	22,94,199	3.56	23,78,887
Jun-23	52,92,524	3.42	54,79,938	22,95,669	3.42	23,76,961
Jul-23	47,60,874	3.24	49,20,291	22,16,231	3.24	22,90,441
Aug-23	49,83,012	3.22	51,48,803	22,27,221	3.22	23,01,324
Sep-23	46,89,853	3.28	48,48,897	20,81,323	3.28	21,51,906
Oct-23	51,15,413	3.53	53,02,595	21,71,787	3.53	22,51,256
Nov-23	47,42,609	3.17	48,97,872	19,66,376	3.17	20,30,751
Dec-23	44,99,459	2.94	46,35,750	18,54,202	2.94	19,10,367
Jan-24	43,58,348	2.84	44,85,743	18,96,074	2.84	19,51,497
Feb-24	41,04,964	3.07	42,34,978	18,84,877	3.07	19,44,575
Mar-24	44,40,170	3.21	45,87,426	19,80,301	3.21	20,45,977
Total	**5,73,98,505**		**5,93,45,830**	**2,49,09,437**		**2,57,53,764**

	GEPL SEZ			LBSCML		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	22,30,841	3.71	23,16,794	2,93,375	3.71	3,04,679
May-23	25,45,504	3.56	26,39,469	3,35,197	3.56	3,47,571
Jun-23	24,79,432	3.42	25,67,231	3,33,694	3.42	3,45,510
Jul-23	22,42,599	3.24	23,17,692	2,74,975	3.24	2,84,183
Aug-23	23,44,266	3.22	24,22,263	2,76,839	3.22	2,86,050
Sep-23	21,88,600	3.28	22,62,821	2,79,728	3.28	2,89,214
Oct-23	23,48,453	3.53	24,34,387	2,82,612	3.53	2,92,953
Nov-23	22,00,133	3.17	22,72,160	2,53,806	3.17	2,62,115
Dec-23	21,07,595	2.94	21,71,435	2,84,066	2.94	2,92,671
Jan-24	21,04,256	2.84	21,65,764	2,49,419	2.84	2,56,710
Feb-24	20,33,456	3.07	20,97,860	2,35,932	3.07	2,43,405
Mar-24	21,70,668	3.21	22,42,657	2,85,519	3.21	2,94,988
Total	**2,69,95,803**		**2,79,10,534**	**33,85,162**		**35,00,047**

	EON Khardi Phase I			EON Khardi Phase II		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	26,55,198	3.71	27,57,501	22,51,529	3.71	23,38,279
May-23	28,74,783	3.56	29,80,903	24,48,270	3.56	25,38,646
Jun-23	28,65,094	3.42	29,66,550	24,26,800	3.42	25,12,736
Jul-23	23,79,416	3.24	24,59,091	21,56,953	3.24	22,29,178
Aug-23	37,12,773	3.22	38,36,302	21,91,818	3.22	22,64,743
Sep-23	34,84,985	3.28	36,03,169	20,89,469	3.28	21,60,328
Oct-23	37,70,095	3.53	39,08,049	22,13,167	3.53	22,94,151
Nov-23	33,86,357	3.17	34,97,219	19,66,701	3.17	20,31,086
Dec-23	29,74,850	2.94	30,64,960	17,88,551	2.94	18,42,727
Jan-24	32,30,696	2.84	33,25,130	17,52,912	2.84	18,04,150
Feb-24	33,93,068	3.07	35,00,534	17,92,835	3.07	18,49,618
Mar-24	38,22,730	3.21	39,49,509	20,23,848	3.21	20,90,968
Total	**3,85,50,045**		**3,98,48,917**	**2,51,02,853**		**31,19,531**

Superintending Engineer (EA)
MSETCL, MSLDC, Airoli

	JNPT			MADC		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	4,90,780	3.71	5,09,689	66,85,431	3.71	69,43,017
May-23	5,17,991	3.56	5,37,112	72,87,517	3.56	75,56,529
Jun-23	5,52,571	3.42	5,72,138	74,86,954	3.42	77,52,075
Jul-23	5,54,700	3.24	5,73,274	73,78,026	3.24	76,25,079
Aug-23	5,97,662	3.22	6,17,547	72,55,954	3.22	74,97,369
Sep-23	5,99,927	3.28	6,20,272	68,75,393	3.28	71,08,554
Oct-23	5,16,182	3.53	5,35,070	68,37,367	3.53	70,87,558
Nov-23	3,91,886	3.17	4,04,715	59,21,197	3.17	61,15,044
Dec-23	4,59,688	2.94	4,73,612	58,76,776	2.94	60,54,787
Jan-24	4,49,794	2.84	4,62,942	59,05,780	2.84	60,78,407
Feb-24	4,51,031	3.07	4,65,316	60,71,670	3.07	62,63,974
Mar-24	5,22,773	3.21	5,40,111	69,85,444	3.21	72,17,113
Total	**61,04,985**		**63,11,799**	**8,05,67,509**		**8,32,99,505**

	AEML SEEPZ Ltd(ASL) (started from 01.11.23)		
	Drawl (KWH) (T<>D)	% State Grid Loss	Drawl (KWH) (Loss Adjusted)
Apr-23	0	3.71	0
May-23	0	3.56	0
Jun-23	0	3.42	0
Jul-23	0	3.24	0
Aug-23	0	3.22	0
Sep-23	0	3.28	0
Oct-23	0	3.53	0
Nov-23	93,07,595	3.17	96,12,305
Dec-23	86,39,833	2.94	89,01,538
Jan-24	82,37,874	2.84	84,78,668
Feb-24	86,21,459	3.07	88,94,521
Mar-24	95,91,702	3.21	99,09,807
Total	**4,43,98,463**		**4,57,96,839**

Superintending Engineer (EA)
MSETCL, MSLDC, Airoli

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA

Stamp Office, Mumbai

No. 694

0 NOV 2008

Officer

BS 315869

M.S.E.T.C.L.
"PRAKASH GANGA"
4th Floor, Plot No. C-19,
"E" Block, Bandra-Kurla Complex,
Bandra (E), Mumbai - 400 051
मुद्रांक बिक्रेता
अविनाश मोहनसिंग चव्हाण

NOTARY
M. S. GAITONDE
GR. MUMBAI

THIS BULK POWER TRANSMISSION AGREEMENT (hereinafter referred to as "BPTA" or "Agreement" or "the Agreement" or "this Agreement") is made on the 12th of JANUARY Two Thousand Nine.

Between:

Brihanmumbai Electric Supply & Transport Undertaking (of the Brihanmumbai Mahanagarpalika), (a company incorporated under the Companies Act, 1913), having its registered office at BEST Bhavan, Colaba, Mumbai 400 001 (hereinafter referred to as "***BEST***" which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as party of the one part;

and

611 C

भारतीय गैर न्यायिक

एक सौ रुपये

Rs. 100

रु. 100

ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA

BS 315845

General Stamp Office, Mumbai
S. V. No. 694
20 NOV 2008
Proper Officer

L. S. BAMBLE

दि महाराष्ट्र मंत्रालय अँड अलाइड ऑफिसर्स को. ऑप. बँक लि., मंत्रालय, मुंबई ४०० ०३२
एल. एस. व्ही. क्रमांक:- ६१४
क्रमांक:- 992 दिनांक:-
बांद्रा शाखा, बांद्र (पूर्व), मुंबई.
सर्वश्री/श्री./श्रीमती M.S.E.T.C.L.
यांना न्यायेत्तर मुद्रांक रु
विकला.

-2 JAN 2009

"PRAKASH GANGA"
4th Floor, Plot No. C-19,
"E" Block, Bandra-Kurla Complex,
Bandra (E), Mumbai - 400 051
मुद्रांक विक्रेता
अविनाश मोहनसिंग चव्हाण

Maharashtra State Electricity Transmission Company Limited,(a company incorporated under the Companies Act, 1956), having its registered office at "Prakashganga", Plot No C 19, 'E' Block, Bandra Kurla Complex, Bandra (East), Mumbai-400051 (hereinafter referred to as "*MSETCL*" which expression shall unless repugnant to the context or meaning thereof include its successors, and permitted assigns) as party of the other part;

AS:

Maharashtra Electricity Regulatory Commission in MERC (Transmission Open Access) Regulations, 2005 at clause 5.1 stipulate that, *"Provided further that a user of an intra-State transmission system under this Regulation shall enter into a Bulk Power Transmission Agreement with the Transmission Licensee within sixty (60) days from the date on which such user is deemed to be a Transmission System User under this Regulation."*

If any of agreements, correspondence or communication is prepared in any language other than English, the English translation of such documents, correspondence or communications shall prevail in matters of interpretation.

1.7 Discretion

Except where this Agreement expressly requires a party to act fairly or reasonably, a party may exercise any discretion given to it under this Agreement in any way it deems fit.

1.8 Discrepancy

In case of discrepancy between terms and conditions stipulated in MERC Transmission License Conditions, Regulations 2004 and/or those of *Transmission License* issued to ***MSETCL*** and the agreement(s) executed between ***BEST*** and ***MSETCL,*** the terms and conditions of MERC Transmission License Conditions, Regulations 2004 and/or those of Transmission License shall prevail.

2. EFFECTIVE DATE AND DURATION OF AGREEMENT

2.1 Effective Date

This Agreement shall be effective from the date on which Bulk Power Transmission Agreement is executed and delivered by parties or the date on which System strengthening schemes as defined by STU are commissioned, whichever is later;

2.2 Duration of the Agreement

This Agreement shall be deemed to have come into force with effect from Effective Date for all purposes and intents and shall remain operative for the period of 25 [Twenty Five] years.

2.3 Term and Termination

2.3.1 Subject to Clause 2.3.3, this Agreement shall continue to be effective, until the Expiry Date (subject to Clause2.4), when it shall automatically terminate.

2.3.2 Both the parties agree to terminate this agreement through mutual written consent.

2.3.3 This Agreement shall terminate before the Expiry Date, if the Conditions Precedent referred to in clause 3 is neither satisfied nor waived.

2.3.4 If a Termination Notice is served in accordance with clause 18 by

a. ***BEST,*** following ***MSETCL*** Event of Default; or

b. *MSETCL* following *BEST*, Event of Default;

c. If *BEST* or *MSETCL* serves a notice to terminate in accordance with Clause 18.5.

2.4 Survival

The expiry or termination of this Agreement shall not affect any accrued rights, obligations and liabilities of the parties under this Agreement including but not limited to those specifically provided in this Agreement nor shall it affect any continuing obligations which this Agreement provides either expressly or by necessary implication, which are to survive its expiry or termination.

3. CONDITIONS PRECEDENT

3.1 Obligation to satisfy/Waive Condition Precedent

3.1.1 Parties shall use their reasonable endeavors to ensure either the satisfaction or waiver of the condition precedent relating to the effectiveness of their obligations under this Agreement.

3.1.2 Each party shall take all reasonable efforts to satisfy the conditions to which its obligations are subject to as soon as practicable and notify the other party, when such condition is satisfied or waived

3.2 Right to Terminate

This Agreement shall automatically terminate on the termination of the TDA at any time prior to the expiry date of the TDA. However this provision is only for new evacuation schemes.

The common termination clauses for both new and existing transmission lines are covered in clause 18.

4. OPERATION & MAINTENANCE OF TRANSMISSION SYSTEM

4.1 *Transmission licensee's* obligations in operation and maintenance of the transmission System

Subject to the terms and conditions of this Agreement, *MSETCL* at its own cost and expense shall observe, comply with, perform, undertake and be responsible:

i) For procuring and maintaining in full force and effect the Consents, required by it pursuant to this Agreement and in accordance with Law.

671C

ii) To maintain and repair the Transmission System as set out in this Agreement and in accordance with the provision of Section 40 of Electricity Act 2003.

iii) For owning the Transmission System throughout the term of this Agreement free and clear of encumbrance except those permitted under this Agreement.

iv) To make available Transmission Capacity as per Yearly Average of schedule (of long term contracted generation) of SLDC for previous year on Intra State Transmission System (InSTS), which is 764 MW for FY 08-09 for ***Brihanmumbai Electric Supply & Transport Undertaking*** (***BEST***)between points of injection and points of drawal as per Schedule 3.

v) For providing all assistance to the Arbitrator as may be required for the performance of their duties and services; and to comply with its obligations under this Agreement,

vi) to comply with its obligations under this agreement, AND

vii) To provide any other service/assistance as may be mutually agreed upon by the two parties.

5. OPERATING PROCEDURES

5.1 ***MSETCL***, shall provide to the ***BEST*** and ***STU*** with a draft of the operating procedures (the "Operating Procedures") dealing with all operational interfaces between ***MSETCL*** and ***BEST***; including, but not limited to;

i) Methods of round the clock communication between ***MSETCL*** and ***BEST***,

ii) Safety co-ordination;

iii) Seeking permits to work for attending to outages;

iv) Contingency planning in the event of a partial or total shutdown of the grid;

v) Incident reporting;

vi) Testing, inspection and monitoring of the Transmission System;

vii) Maintenance & repair during Scheduled Outages, Unscheduled Outages, Forced Outages and during Force Majeure Events;

69/c

20.5 Compliance and Notification

If any provision of this Agreement shall be in deviation of, inconsistent with or repugnant to the provisions contained in the Electricity Act, 2003, such provision shall be deemed to be amended to the extent required to bring it into compliance with the relevant provisions of the Electricity Act, 2003 as amended from time to time.

IN WITNESS WHEREOF, THE PARTIES HAVE CAUSED THIS AGREEMENT TO BE EXECUTED BY THEIR REPRESENTATIVE / DULY AUTHORISED OFFICERS AS OF THE DATE SET FORTH ABOVE.

NOTARY
M. S. GAITONDE
GR. MUMBAI
Regd. No. 193
GOVT. OF MAHARASHTRA

S. A. PURANIK Signed on behalf of
Brihanmumbai Electric Supply & Transport Undertaking
DGM (ES)

SUBRAT RATHO Signed on behalf of
Maharashtra State Electricity Transmission Company Limited
Managing Director
M.S.E.Transmission Co. Ltd.

WITNESSES:

Identified By Me
A. N. PANDE
B.A., LL.B.
ADVOCATE HIGH COURT
Lawyers Chambers,
Bhasker Building,
Bandra Court,
Greater Bombay.

ATUL G. PATIL
CE (Regulatory Cell)

P. G. KHANDALKAR
DIRECTOR (FINANCE)

2.

ATTESTED BY ME
12/1/09
M. S. GAITONDE
B.A., LL. M.
NOTARY
GREATER MUMBAI
GOVT. OF MAHARASHTRA
INDIA

K. N. RAJGOPAL
Dy. Chief, Engineer
(Technical)

S. D. SHROUTY
Executive Director (O)
M.S.E.T.C.L., Mumbai-51.

भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

सत्यमेव जयते

भारत INDIA

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA ◑ 2016 ◑ RP 017948

प्रधान मुद्रांक कार्यालय, मुंबई
प. मु. वि. क्र. ८००००१०
16 DEC 2016
सक्षम अधिकारी

श्री. प्र. ना. चिंचघरे

AMENDMENT TO THE BPTA EXECUTED BETWEEN MSETCL AND BEST ON 12.01.2009

Pursuant to Hon'ble Maharashtra Electricity Regulatory Commission (MERC) Suo Moto InSTS Tariff Order Case No.91 of 2016 dated 22nd July, 2016,

The Clause 4.1(iv) (on Page No. 07) of the BPTA executed between MSETCL and BEST on 12th Jan, 2009 is amended as follows :

Clause 4.1 (iv)

"To make available Transmission Capacity on Intra State Transmission System (InSTS) as per Long Term contracted Generation Capacity which is 952 MW (Annexure – I) for FY 2016-17 for BEST between points of Injection and points of Drawl.

The Base Transmission Capacity Rights (Base TCR) on Intra State Transmission System (InSTS) of Maharashtra for BEST will be as determined by the Hon'ble Maharashtra Electricity Regulatory Commission (MERC) in the matter of Determination of Transmission Tariff for Intra State Transmission System (InSTS), from time to time."

C.E. (S.T.U.)

Name of the TSU (Distribution Licensee) : BEST Undertaking, Mumbai.

Information of Generation Capacity Contracted or otherwise arranged

Sr. No.	Power Project/ Agency	Capacity of Power Project/ Agency in MW	Capacity Contracted/ arranged (MW)	Capacity Presently Utilized	Prospective Date of Balance Capacity Utilization	* Date of PPA	Duration of PPA (years)	Remarks
1	TPC-G (Hydro)	447	228	224	-	01.04.2008	10	Hydro Power
2	TPC-G Unit No. 5	500	256	241	-	01.04.2008	10	Thermal Power
3	TPC-G Unit No. 6	500	256	* 0		01.04.2008	10	* Economy shutdown & kept stand by (As per MERC order Oil Unit is kept off for high fuel cost, proposed for conversion of Oil to cool).
4	TPC-G Unit No. 7	180	92	89	-	01.04.2008	10	Thermal Power
5	TPC-G Unit No. 8	250	100	92	-	01.04.2010	8	Thermal Power
6	Welspun Energy Maharashtra Ltd.	20	20	20	-	27.05.2013	25	Solar RE for fulfilment of BEST RPO
		1947	952	665				

NOTE :

Capacity presently utilized is calculated after deducting Auxiliary Consumption.

* PPA between BEST & TPC-G for 800 MW power executed on 21.12.2006 & commission approved for period 01.04.2008 to 31.03.2018 & the same PPA extended for 100 MW on 05.02.2010 & commission approved for period 01.04.2010 upto the period 31.03.2018

C.E. (S.T.U.) MSETCL

12/1

19/1/17

DCEPL

D:\BPTA\[Generation Capacity - BPTA - Annexure - I.xlsx]Sheet1

भारतीय गैर न्यायिक

भारत INDIA

रु. 500 FIVE HUNDRED RUPEES

पाँच सौ रुपये Rs. 500

सत्यमेव जयते

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA ◑ 2024 ◑ CU 486138

प्रधान मुद्रांक कार्यालय, मुंबई
प.मु.वि.क्र. ८००००३०
19 NOV 2024
सक्षम अधिकारी

श्रीमती मिनल महाजन,

AMENDMENT TO THE BPTA EXECUTED BETWEEN MSETCL AND BEST ON 12/01/2009

Pursuant to Hon'ble Maharashtra Electricity Regulatory Commission (MERC) tariff order dated 31.03.2023 in Case No.239 of 2022 in the matter of " **Determination of Multi-Year Tariff for Intra-State Transmission Tariff for the Balance period of 4th Control Period for FY 2023-24 & FY 2024-25**".

The Clause 4.1(iv) (on Page No.7) of the BPTA executed between **MSETCL** and **BEST** on 12th Jan, 2009 is amended as follows:

Clause 4.1(iv)

"To make available Transmission Capacity on Intra-State Transmission System (InSTS) as per Long Term & Medium Term contracted Generation Capacity which is 921.69 MW (Annexure – I) for FY 2024-25 for BEST between points of injection and points of Drawl.

p.t.o.

जोडपत्र - २ Annexure - 2

मुद्रांक विक्री नोंद वही अनु क्रमांक/दिनांक (Serial No./Date)	79
दस्ताचा प्रकार (Nature of Document)	AGREEMENT
[illegible]	
[illegible]	Prashant S. Pavshe
[illegible]	M 75
[illegible]	BEST
[illegible] (Stamp Purchaser)	
मुद्रांक विक्रेत्याची सही	

28 NOV 2024

परवाना क्रमांक : ८००००६०

मुद्रांक विक्रीचे ठिकाण/पत्ता :

स्वाती सुर्यकांत शिर्के

[illegible] मल्टि स्टेट [illegible] को-ऑपरेटिव्ह सोसायटी लि.

नगर दिवानी व सत्र न्यायालय, जुनी सचिवालय इमारत, काला घोडा,

पहिला मजला, मुंबई विद्यापीठाजवळ, मुंबई - ४०० ०३२.

ज्या कारणासाठी ज्यांनी मुद्रांक खरेदी केला त्यांनी त्याचे कारणासाठी मुद्रांक खरेदी केल्यापासून ६ महिन्यात वापरणे बंधनकारक आहे.

The Base Transmission Capacity Rights (Base TCR) on Intra-State Transmission System (InSTS) of Maharashtra for BEST will be as determined by the Hon'ble Maharashtra Electricity Regulatory Commission (MERC) in the matter of Determination of Transmission Tariff for Intra-State Transmission System (InSTS), from time to time."

The generation capacity contracted to be considered under the Commission approved Base TCR of BEST is as per MERC tariff order in Case No.239 of 2022.

(Peeyush S. Sharma) **Chief Engineer (STU)** **MSETCL**	**(Suresh P. Makwana)** **Chief Engineer Planning,** **B.E.S.&T Undertaking**
CE (STU) MSETCL	CHIEF ENGINEER (PLANNING) OFFICE ★ B.E.S. & T. UNDERTAKING
Sign & Stamp	**Sign & Stamp**

Annexure-I

BEST Undertaking, Mumbai

Total Genration Capacity Contracted for FY 2024-25								
Sr. No.	Name of Power Project/Agency (Operationalized)	Location of project	Installed Capacity of Power Project/ Agency (in MW)	Capacity Contracted (Operational PPA) (in MW)	Date of PPA	Contract Period (Long term /Medium term)	Duration of PPA	Remark
1	TPC-G (Hydro)	Bhira	300	153.51	06.03.2024	Medium Term	5 Years	Hydro Power
2	TPC-G (Hydro)	khopoli	72	36.84	06.03.2024	Medium Term	5 Years	Hydro Power
3	TPC-G (Hydro)	Bhivapuri	75	38.38	06.03.2024	Medium Term	5 Years	Hydro Power
4	TPC-G Unit No. 5	Trombay	500	255.85	06.03.2024	Medium Term	5 Years	Thermal Power
5	TPC-G Unit No. 7	Trombay	180	92.11	06.03.2024	Medium Term	5 Years	Thermal Power
6	TPC-G Unit No. 8	Trombay	250	100	06.03.2024	Medium Term	5 Years	Thermal Power
7	* M/s Manikaran Power Ltd.	Varora Dist-Chandrapur	540	100	24.05.2019	Medium Term	5 Years	Thermal Power
8	Walwhan Solar MH Ltd.	Mangalwedha Dist- Solapur	20	20	27.05.2013	Long Term	25 years	Solar RE for fulfilment of BEST RPO for Long Term
9	# M/s Sai Wardha power Generation pvt. Ltd.	Varora Dist-Chandrapur	540	125	15.10.2024	Medium Term	7 Years	Thermal Power
				921.69				

Total Genration Capacity Contracted for FY 2024-25 is **921.69 MW**

* Agreement for procurement of Power (APP) is signed between BEST & M/s Manikaran Power Ltd. (100 MW) through M/s Sai Wardha Power Generation Ltd. for 5 years from 01.04.2019 to 31.03.2024, however actual power flow started from 01.03.2020.

Agreement for procurement of Power (APP) is signed between BEST & M/s Sai Wardha Power Generation pvt. Ltd. for 125 MW RTC Power for 7 years on 15.10.2024. Condition's precedent completed. However, consent of CESTU/CESLDC is awaited.

DEPP 22/11/2024

Power Purchase Dept

ELECTRIC SUPPLY

भारतीय गैर न्यायिक

भारत INDIA

रु. 500 FIVE HUNDRED RUPEES

पाँच सौ रुपये Rs. 500

सत्यमेव जयते

INDIA NON JUDICIAL

महाराष्ट्र MAHARASHTRA ◑ 2024 ◑ CU 486138

प्रधान मुद्रांक कार्यालय, मुंबई
प.मु.वि.क्र ८०००३०
19 NOV 2024
सक्षम अधिकारी

श्रीमती मिनल महाजन,

AMENDMENT TO THE BPTA EXECUTED BETWEEN MSETCL AND BEST ON 12/01/2009

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p.t.o.

जोडपत्र - २ Annexure - 2

मुद्रांक विक्री नोंद वही अनु क्रमांक/दिनांक (Serial No./Date)	79
दस्ताचा प्रकार (Type of Document) AGREEMENT	
दस्त नोंदणी करणार आहेत का? (Whether to be Registered)	
मिळकतीचे वर्णन (...)	Prashant S. Pawsle
...	M 75
ज्या ... (Name of ...)	BEST
मुद्रांक विकत ... (Stamp Purchaser ...)	
मुद्रांक विक्रेत्याची सही	

28 NOV 2024

परवाना क्रमांक : ८००००६०

मुद्रांक विक्रीचे ठिकाण/पत्ता : स्वाती सु. शिर्के

नगर दिवानी व सत्र न्यायालय, जुनी सचिवालय इमारत, काला घोडा, पहिला मजला, मुंबई विद्यापीठाजवळ, मुंबई - ४०० ०३२.

ज्या कारणासाठी ज्यांनी मुद्रांक खरेदी केला त्यांनी त्याच कारणासाठी मुद्रांक खरेदी केल्यापासून ६ महिन्यात वापरणे बंधनकारक आहे.

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The generation capacity contracted to be considered under the Commission approved Base TCR of BEST is as per MERC tariff order in Case No.239 of 2022.

(Peeyush S. Sharma)	**(Suresh P. Makwana)**
Chief Engineer (STU)	**Chief Engineer Planning,**
MSETCL	**B.E.S.&T Undertaking**
CE (STU) MSETCL	CHIEF ENGINEER (PLANNING) OFFICE ★ B.E.S. & T. UNDERTAKING
Sign & Stamp	**Sign & Stamp**

BEST Undertaking, Mumbai

Total Genration Capacity Contracted for FY 2024-25								
Sr. No.	**Name of Power Project/Agency (Operationalized)**	**Location of project**	**Installed Capacity of Power Project/ Agency (in MW)**	**Capacity Contracted (Operational PPA) (in MW)**	**Date of PPA**	**Contract Period (Long term /Medium term)**	**Duration of PPA**	**Remark**
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				921.69				

Total Genration Capacity Contracted for FY 2024-25 is **921.69 MW**

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DEPP 22/11/2024

Executive Engineer
Power Purchase Dept

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

TELEPHONE : (022) 22856262
FAX : (022) 22851244
TELEX : 1185755 BEST IN
TELEGRAM : BEST, MUMBAI-400 001.

BEST BHAVAN,
BEST MARG,
POST BOX NO. 192.
MUMBAI - 400 001.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

OUR REF. : PP/MEDA/ RPO/2022-23 / 42 /2023

DATE : 13 JUN 2023

To,
General Manager (REC, RPO)
Maharashtra Energy Development Agency,
Government of Maharashtra
Aundh Road, Opposite Spicer College,
Near Commissionerate of Animal Husbandry,
PUNE – 411 067.
Email: - manrd@mahaurja.com

Sub:- Submission of final audited RPO achievement data of BEST for FY 2022-23 as per MERC (RPO Compliance &Implementation of REC framework) Regulations, 2019.

Ref: - Your email dated 18.04.2023

Sir,

With reference to your above referred email, we are submitting the final audited RPO achievement report for FY 2022-23. Necessary information is as below,

A. Gross Electricity Consumption and procurement of Renewable Energy for FY 2022-23 in the prescribed Form No. I, II, III.
B. CPP / OA consumer Data FY 2022-23.
C. Source wise contracted RE capacity addition in MW & details of RE procured in MUs for FY 2022-23.

Thanking you,

Yours faithfully,

13.06.2023

(Satish A. Jadhav)
Divisional Engineer
Power Purchase

Encl: - As above

"BEST Travel Saves Fuel"

Gross Energy Consumption statement of BEST Undertaking FY 2022-23

Power Purchase for FY 2022-23	Energy at T<>D interface as per e-mail from SLDC dtd. 09.06.2023	Transmission Loss as per MSLDC	Grossed up Energy at G<>T as per SLDC Certification	Energy procured from Hydro source by BEST	GEC for Obligation
Month	MUs	%	MUs	MUs	MUs
Apr-22	441.883164	3.43	457.578093	70.706979	386.871114
May-22	463.530626	3.26	479.150947	68.422878	410.728069
Jun-22	425.199934	3.29	439.664910	58.579871	381.085039
Jul-22	388.525073	3.47	402.491529	89.276994	313.214535
Aug-22	391.307195	3.21	404.284735	94.111280	310.173455
Sep-22	390.254871	3.32	403.656259	73.849146	329.807113
Oct-22	403.209071	3.00	415.679455	49.835879	365.843576
Nov-22	367.392652	3.20	379.537864	47.029058	332.508806
Dec-22	370.587610	3.13	382.561794	55.088434	327.473360
Jan-23	310.881873	3.12	320.893758	60.564104	260.329654
Feb-23	325.022233	3.43	336.566463	54.680815	281.885648
Mar-23	400.881298	3.23	414.261959	56.944211	357.317748
TOTAL	**4678.675600**		**4836.327764**	**779.089649**	**4057.238116**

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * DEPP *

BEST Undertaking, MUMBAI

Form-I: RPO Settlement Account FY-2022-23

A - SOLAR

Gross Energy Consumption for Obligation (Excluding Hydro)		RPO Obligation (8.00%)	RPO % up to Previous month	RPO % Cumulative up to month (1)	**RE Purchase for the Month**		RE Purchase upto the Previous Month		RE Cumulative up to the Month (2)		**Short if any (1-2)**
					MU's		MU's		MU's		
Month	MU's	MU's	MU's	MU's	**Pref Tariff**	**REC**	Pref Tariff	REC	Pref Tariff	REC	**MU's**
Apr-22	386.871114	30.95	0.00	30.95	**2.895303**	**0.00**	0.00	0.00	2.90	0.00	**28.05**
May-22	410.728069	32.86	30.95	63.81	**2.888148**	**0.00**	2.90	0.00	5.78	0.00	**58.02**
Jun-22	381.085039	30.49	63.81	94.29	**7.652486**	**0.00**	5.78	0.00	13.44	0.00	**80.86**
Jul-22	313.214535	25.06	94.29	119.35	**19.877044**	**0.00**	13.44	0.00	33.31	0.00	**86.04**
Aug-22	310.173455	24.81	119.35	144.17	**8.169947**	**0.00**	33.31	0.00	41.48	0.00	**102.68**
Sep-22	329.807113	26.38	144.17	170.55	**2.098816**	**0.00**	41.48	0.00	43.58	0.00	**126.97**
Oct-22	365.843576	29.27	170.55	199.82	**2.503653**	**0.00**	43.58	0.00	46.09	0.00	**153.73**
Nov-22	332.508806	26.60	199.82	226.42	**2.565313**	**0.00**	46.09	0.00	48.65	0.00	**177.77**
Dec-22	327.473360	26.20	226.42	252.62	**2.504450**	**0.00**	48.65	0.00	51.16	0.00	**201.46**
Jan-23	260.329654	20.83	252.62	273.44	**2.885478**	**0.00**	51.16	0.00	54.04	0.00	**219.40**
Feb-23	281.885648	22.55	273.44	295.99	**2.946628**	**0.00**	54.04	0.00	56.99	0.00	**239.01**
Mar-23	357.317748	28.59	295.99	324.58	**3.270381**	**0.00**	56.99	0.00	60.26	0.00	**264.32**
	*** Solar Energy Generation from Net metered consumers for FY 2022-23**			324.58	**11.796648**	**0.00**	60.26	0.00	72.05	0.00	**252.52**
TOTAL	**4057.238116**	**324.579049**		**324.58**	**72.054294**	**0.00**		**0.00**	**72.05**	**0.00**	**252.52**

B - Non-Solar

Gross Energy Consumption for Obligation (Excluding Hydro)		RPO Obligation (11.50%)	RPO % up to Previous month	RPO % Cumulative up to month (1)	**RE Purchase for the Month**		RE Purchase upto the Previous Month		RE Cumulative up to the Month (2)		**Short if any (1-2)**
					MU's		MU's		MU's		
Month	MU's	MU's	MU's	MU's	**Pref Tariff**	**REC**	Pref Tariff	REC	Pref Tariff	REC	**MU's**
Apr-22	386.871114	44.49	0.00	44.49	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**44.49**
May-22	410.728069	47.23	44.49	91.72	**0.0043**	**0.00**	0.00	0.00	0.00	0.00	**91.72**
Jun-22	381.085039	43.82	91.72	135.55	**0.86**	**0.00**	0.00	0.00	0.86	0.00	**134.69**
Jul-22	313.214535	36.02	135.55	171.57	**2.64**	**0.00**	0.86	0.00	3.50	0.00	**168.07**
Aug-22	310.173455	35.67	171.57	207.24	**1.76**	**0.00**	2.64	0.00	5.26	0.00	**201.98**
Sep-22	329.807113	37.93	207.24	245.17	**0.00**	**0.00**	1.76	0.00	5.26	0.00	**239.91**
Oct-22	365.843576	42.07	245.17	287.24	**0.00**	**0.00**	0.00	0.00	5.26	0.00	**281.98**
Nov-22	332.508806	38.24	287.24	325.48	**0.00**	**0.00**	0.00	0.00	5.26	0.00	**320.22**
Dec-22	327.473360	37.66	325.48	363.14	**0.00**	**0.00**	0.00	0.00	5.26	0.00	**357.88**
Jan-23	260.329654	29.94	363.14	393.07	**0.00**	**0.00**	0.00	0.00	5.26	0.00	**387.81**
Feb-23	281.885648	32.42	393.07	425.49	**0.00**	**0.00**	0.00	0.00	5.26	0.00	**420.23**
Mar-23	357.317748	41.09	425.49	466.58	**0.00**	**0.00**	0.00	0.00	5.26	0.00	**461.32**
TOTAL	**4057.238116**	**466.58**		**466.58**	**5.26**	**0.00**		**0.00**	**5.26**	**0.00**	**461.32**

As per RPO-REC Regulation, 2019	
Solar	*8.00%*
Non Soalar	*11.50%*

Note:- We hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/1/23

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	April- 2022			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		386.871114	
		Sub Total (2)	**386.87**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S) for obligation		**386.87**	
2	**RPO Obligation (19.50 % of GEC)**		**75.44**	

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
INTERNAL AUDIT DEPARTMENT

B.E.S.&T. Undertaking
DEPP.

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	April- 2022			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.895303	Long Term PPA
		Sub Total (B)	**2.90**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.90**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	May- 2022			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
	Sub Total (1)		**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd.Excluding Hydro		410.728069	
	Sub Total (2)		**410.73**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
	Sub Total (3)		**0**	
	Total GEC for The Month (O+P-S)		**410.73**	
2	**RPO Obligation (19.50 % of GEC)**		**80.09**	

DW
13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * DEPP *

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	May- 2022			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.841488	Long Term PPA
2	Solar energy purchased from IEX		0.046660	
		Sub Total (B)	**2.89**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.89**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		0	BEST not having own RE generation
		Sub Total (A)	**0**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Non-Solar energy purchased from IEX		0.00433	
		Sub Total (B)	**0.0043**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**0**	
	Total GEC for The Month (A+B+C)-(D)		**0.0043**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

DW
13/6/22

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * DEPP *

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : May-2022 **Issued on :** 01/06/2022

Portfolio Name: **BEST**

This is certified that BEST has purchased 52.82 MWh (at regional periphery) of Renewable Energy for the period 01/05/2022 to 31/05/2022 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
48.33	4.49	0	52.82

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

13/6/22

*Computer generated report signature not required.

IEX
INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Portfolio ID	W2MH0BST0001
Portfolio Name	BEST

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
14-May-22	0	0	0	0
16-May-22	0	0	0	0
17-May-22	0	0	0	0
18-May-22	0	0	0	0
25-May-22	48.33	4.49	0	52.82
28-May-22	0	0	0	0
Grand Total				52.82

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
14-May-22	0	0	0	0
16-May-22	0	0	0	0
17-May-22	0	0	0	0
18-May-22	0	0	0	0
25-May-22	46.66	4.33	0	50.99
28-May-22	0	0	0	0
Grand Total				50.99

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
14-May-22	0	0	0	0
16-May-22	0	0	0	0
17-May-22	0	0	0	0
18-May-22	0	0	0	0
25-May-22	45.17	4.2	0	49.37
28-May-22	0	0	0	0
Grand Total				49.37

13/6/23

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Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	June- 2022			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		381.085039	
		Sub Total (2)	**381.09**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**381.09**	
2	**RPO Obligation (17.50 % of GEC)**		**66.69**	

12/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * DEPP *

Form III - Renewable Energy Procurement

BEST Undertaking. Mumbai.

June- 2022

	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.661366	Long Term PPA
2	Solar energy purchased from IEX		4.991120	
		Sub Total (B)	**7.65**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**7.65**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Non-Solar energy purchased from IEX		0.8565	
		Sub Total (B)	**0.86**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.86**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

12/6/23

B.E.S. & T. Undertaking DEPP

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : June-2022 **Issued on :** 01/07/2022

Portfolio Name: **BEST**

This is certified that BEST has purchased 6051.60 MWh (at regional periphery) of Renewable Energy for the period 01/06/2022 to 30/06/2022 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
5165.26	886.34	0	6051.6

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

DM
12/8/22

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S.&T. Undertaking * DEPP *

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IEX
INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Jun-22	364.57	101.73	0	466.3
03-Jun-22	83.84	11.5	0	95.34
04-Jun-22	103.17	14.77	0	117.94
05-Jun-22	75.88	3.94	0	79.82
06-Jun-22	117.67	14.17	0	131.84
07-Jun-22	38.41	8.37	0	46.78
08-Jun-22	405.35	55.09	0	460.44
09-Jun-22	26.76	3.68	0	30.44
10-Jun-22	455.05	45.64	0	500.69
11-Jun-22	0	0	0	0
12-Jun-22	4.14	0.48	0	4.62
13-Jun-22	0	0	0	0
14-Jun-22	0	0	0	0
15-Jun-22	0	0	0	0
16-Jun-22	0	0	0	0
17-Jun-22	0	0	0	0
18-Jun-22	0	0	0	0
19-Jun-22	62.7	32.22	0	94.92
20-Jun-22	49.31	7.74	0	57.05
21-Jun-22	390.87	99.5	0	490.37
22-Jun-22	598.21	208.67	0	806.88
23-Jun-22	465.34	56.4	0	521.74
24-Jun-22	253.76	15.65	0	269.41
25-Jun-22	0	0	0	0
27-Jun-22	577.19	68.21	0	645.4
28-Jun-22	297.1	24.73	0	321.83
29-Jun-22	119.08	21.2	0	140.28
30-Jun-22	676.86	92.65	0	769.51
Grand Total				6051.6

B.E.S. & T. Undertaking
DEPP

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INDIAN ENERGY EXCHANGE

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Jun-22	351.92	98.19	0	450.11
03-Jun-22	80.93	11.1	0	92.03
04-Jun-22	99.59	14.27	0	113.86
05-Jun-22	73.25	3.8	0	77.05
06-Jun-22	113.73	13.69	0	127.42
07-Jun-22	37.12	8.09	0	45.21
08-Jun-22	391.79	53.25	0	445.04
09-Jun-22	25.87	3.55	0	29.42
10-Jun-22	439.85	44.11	0	483.96
11-Jun-22	0	0	0	0
12-Jun-22	4	0.46	0	4.46
13-Jun-22	0	0	0	0
14-Jun-22	0	0	0	0
15-Jun-22	0	0	0	0
16-Jun-22	0	0	0	0
17-Jun-22	0	0	0	0
18-Jun-22	0	0	0	0
19-Jun-22	60.73	31.21	0	91.94
20-Jun-22	47.66	7.48	0	55.14
21-Jun-22	377.76	96.17	0	473.93
22-Jun-22	578.14	201.67	0	779.81
23-Jun-22	449.72	54.51	0	504.23
24-Jun-22	245.25	15.13	0	260.38
25-Jun-22	0	0	0	0
27-Jun-22	557.68	65.91	0	623.59
28-Jun-22	287.05	23.9	0	310.95
29-Jun-22	115.06	20.48	0	135.54
30-Jun-22	654.02	89.53	0	743.55
Grand Total				5847.62

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Jun-22	340.71	95.08	0	435.79
03-Jun-22	78.35	10.75	0	89.1
04-Jun-22	96.43	13.81	0	110.24
05-Jun-22	70.92	3.68	0	74.6
06-Jun-22	110.11	13.25	0	123.36
07-Jun-22	35.94	7.83	0	43.77
08-Jun-22	379.32	51.55	0	430.87
09-Jun-22	25.04	3.44	0	28.48

B.E.S. & T. Undertaking DEPP

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

13/6/23

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INDIAN ENERGY EXCHANGE

10-Jun-22	425.87	42.7	0	468.57
11-Jun-22	0	0	0	0
12-Jun-22	3.87	0.45	0	4.32
13-Jun-22	0	0	0	0
14-Jun-22	0	0	0	0
15-Jun-22	0	0	0	0
16-Jun-22	0	0	0	0
17-Jun-22	0	0	0	0
18-Jun-22	0	0	0	0
19-Jun-22	58.8	30.22	0	89.02
20-Jun-22	46.14	7.24	0	53.38
21-Jun-22	365.75	93.11	0	458.86
22-Jun-22	559.76	195.25	0	755.01
23-Jun-22	435.42	52.78	0	488.2
24-Jun-22	237.45	14.65	0	252.1
25-Jun-22	0	0	0	0
27-Jun-22	539.95	63.81	0	603.76
28-Jun-22	277.92	23.14	0	301.06
29-Jun-22	111.4	19.83	0	131.23
30-Jun-22	633.22	86.68	0	719.9
Grand Total				5661.62

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Jun-22	340.71	95.08	0	435.79
03-Jun-22	78.35	10.75	0	89.1
04-Jun-22	96.43	13.81	0	110.24
05-Jun-22	70.92	3.68	0	74.6
06-Jun-22	110.11	13.25	0	123.36
07-Jun-22	35.94	7.83	0	43.77
08-Jun-22	379.32	51.55	0	430.87
09-Jun-22	25.04	3.44	0	28.48
10-Jun-22	425.87	42.7	0	468.57
11-Jun-22	0	0	0	0
12-Jun-22	3.87	0.45	0	4.32
13-Jun-22	0	0	0	0
14-Jun-22	0	0	0	0
15-Jun-22	0	0	0	0
16-Jun-22	0	0	0	0
17-Jun-22	0	0	0	0
18-Jun-22	0	0	0	0
19-Jun-22	58.8	30.22	0	89.02
20-Jun-22	46.14	7.24	0	53.38

B.E.S. & T. Undertaking DEPP

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Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	July- 2022			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		313.214535	
		Sub Total (2)	**313.21**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**313.21**	
2	**RPO Obligation (19.50 % of GEC)**		**61.08**	

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * DEPP *

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	July- 2022			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	1.900434	Long Term PPA
2	Solar energy purchased from IEX		17.976610	
		Sub Total (B)	**19.88**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**19.88**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Non-Solar energy purchased from IEX		2.63794	
		Sub Total (B)	**2.64**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.64**	

NOTE: - 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/10/22

B.E.S. & T. Undertaking DEPP

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : July-2022 **Issued on :** 01/08/2022

Portfolio Name: **BEST**

This is certified that BEST has purchased 21335.83 MWh (at regional periphery) of Renewable Energy for the period 01/07/2022 to 31/07/2022 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
18605.11	2730.72	0	21335.83

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

13/6/23

B.E.S. & T. Undertaking DEPP

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INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-22	881.74	196.72	0	1078.46
02-Jul-22	693.63	163.16	0	856.79
03-Jul-22	457.46	70.37	0	527.83
04-Jul-22	744.83	126.32	0	871.15
05-Jul-22	1271.36	173.13	0	1444.49
06-Jul-22	862.4	20.58	0	882.98
07-Jul-22	787.2	48.11	0	835.31
08-Jul-22	1293.49	94.98	0	1388.47
09-Jul-22	1288.71	77.45	0	1366.16
10-Jul-22	987.98	183.2	0	1171.18
11-Jul-22	1264.95	234.83	0	1499.78
12-Jul-22	2371.92	254.4	0	2626.32
13-Jul-22	1705.74	43.24	0	1748.98
14-Jul-22	738.12	21.63	0	759.75
16-Jul-22	65.62	4.38	0	70
17-Jul-22	347.47	88.14	0	435.61
18-Jul-22	365.38	135.88	0	501.26
19-Jul-22	289.25	115.79	0	405.04
20-Jul-22	567.36	229.59	0	796.95
21-Jul-22	16.46	5.32	0	21.78
22-Jul-22	294.81	105.3	0	400.11
23-Jul-22	7.54	2.14	0	9.68
24-Jul-22	201.81	76.68	0	278.49
25-Jul-22	414.91	62.58	0	477.49
26-Jul-22	0	0	0	0
27-Jul-22	97.75	12.26	0	110.01
28-Jul-22	317.21	55.36	0	372.57
29-Jul-22	0	0	0	0
30-Jul-22	112.28	49.61	0	161.89

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INDIAN ENERGY EXCHANGE

31-Jul-22	157.73	79.57	0	237.3
Grand Total				21335.83

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-22	851.93	190.06	0	1041.99
02-Jul-22	670.17	157.65	0	827.82
03-Jul-22	442	67.98	0	509.98
04-Jul-22	719.23	121.96	0	841.19
05-Jul-22	1227.66	167.18	0	1394.84
06-Jul-22	832.72	19.87	0	852.59
07-Jul-22	760.12	46.44	0	806.56
08-Jul-22	1248.99	91.7	0	1340.69
09-Jul-22	1244.37	74.79	0	1319.16
10-Jul-22	954.01	176.89	0	1130.9
11-Jul-22	1223.69	227.17	0	1450.86
12-Jul-22	2294.57	246.09	0	2540.66
13-Jul-22	1650.11	41.82	0	1691.93
14-Jul-22	714.05	20.93	0	734.98
16-Jul-22	63.48	4.24	0	67.72
17-Jul-22	336.14	85.26	0	421.4
18-Jul-22	353.16	131.33	0	484.49
19-Jul-22	279.56	111.91	0	391.47
20-Jul-22	548.35	221.9	0	770.25
21-Jul-22	15.91	5.14	0	21.05
22-Jul-22	284.93	101.76	0	386.69
23-Jul-22	7.28	2.07	0	9.35
24-Jul-22	195.05	74.11	0	269.16
25-Jul-22	400.02	60.33	0	460.35
26-Jul-22	0	0	0	0
27-Jul-22	94.07	11.79	0	105.86
28-Jul-22	305.23	53.27	0	358.5
29-Jul-22	0	0	0	0
30-Jul-22	108.04	47.74	0	155.78
31-Jul-22	151.77	76.56	0	228.33
Grand Total				20614.55

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-22	824.83	184.02	0	1008.85
02-Jul-22	648.86	152.63	0	801.49
03-Jul-22	427.93	65.84	0	493.77
04-Jul-22	696.35	118.09	0	814.44

B.E.S. & T. Undertaking DEPP

INTERNAL AUDIT DEPARTMENT

13/6/23

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IEX
INDIAN ENERGY EXCHANGE

05-Jul-22	1188.64	161.85	0	1350.49
06-Jul-22	806.23	19.24	0	825.47
07-Jul-22	735.96	44.96	0	780.92
08-Jul-22	1209.27	88.79	0	1298.06
09-Jul-22	1204.8	72.41	0	1277.21
10-Jul-22	923.67	171.27	0	1094.94
11-Jul-22	1184.76	219.95	0	1404.71
12-Jul-22	2221.58	238.29	0	2459.87
13-Jul-22	1597.62	40.5	0	1638.12
14-Jul-22	691.34	20.27	0	711.61
16-Jul-22	61.45	4.11	0	65.56
17-Jul-22	325.45	82.55	0	408
18-Jul-22	341.93	127.16	0	469.09
19-Jul-22	270.67	108.35	0	379.02
20-Jul-22	530.91	214.85	0	745.76
21-Jul-22	15.41	4.97	0	20.38
22-Jul-22	275.86	98.53	0	374.39
23-Jul-22	7.05	2.01	0	9.06
24-Jul-22	188.84	71.77	0	260.61
25-Jul-22	387.31	58.4	0	445.71
26-Jul-22	0	0	0	0
27-Jul-22	91.07	11.42	0	102.49
28-Jul-22	295.52	51.57	0	347.09
29-Jul-22	0	0	0	0
30-Jul-22	104.61	46.22	0	150.83
31-Jul-22	146.95	74.12	0	221.07
Grand Total				19959.01

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-22	824.83	184.02	0	1008.85
02-Jul-22	648.86	152.63	0	801.49
03-Jul-22	427.93	65.84	0	493.77
04-Jul-22	696.35	118.09	0	814.44
05-Jul-22	1188.64	161.85	0	1350.49
06-Jul-22	806.23	19.24	0	825.47
07-Jul-22	735.96	44.96	0	780.92
08-Jul-22	1209.27	88.79	0	1298.06
09-Jul-22	1204.8	72.41	0	1277.21
10-Jul-22	923.67	171.27	0	1094.94
11-Jul-22	1184.76	219.95	0	1404.71
12-Jul-22	2221.58	238.29	0	2459.87
13-Jul-22	1597.62	40.5	0	1638.12

B.E.S. & T. Undertaking DEPP

INTERNAL AUDIT DEPARTMENT

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Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	August- 2022			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		310.173455	
		Sub Total (2)	**310.17**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**310.17**	
2	**RPO Obligation (19.50 % of GEC)**		**60.48**	

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING ★ INTERNAL AUDIT DEPARTMENT ★

B.E.S. & T. Undertaking ★ DEPP ★

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	August- 2022			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	0	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.053547	Long Term PPA
2	Solar energy purchased from IEX		6.116400	
		Sub Total (B)	8.17	
C	Purchase through REC		0.00	
D	RE Sold to other Person		Nil	
		Sub Total (D)	Nil	
	Total GEC for The Month (A+B+C)-(D)		8.17	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	Nil	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Non-Solar energy purchased from IEX		1.76134	
		Sub Total (B)	1.76	
C	Purchase through REC		0.00	
D	RE Sold to other Person		Nil	
	Total GEC for The Month (A+B+C)-(D)		1.76	

NOTE: - 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

B.E.S. & T. Undertaking BEPP

IEX
INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : August-2022 **Issued on :** 01/09/2022
Portfolio Name: **BEST**

This is certified that BEST has purchased 8143.86 MWh (at regional periphery) of Renewable Energy for the period 01/08/2022 to 31/08/2022 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
6322.58	1821.28	0	8143.86

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

13/6/23

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IEX
INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-22	0	0	0	0
02-Aug-22	0	0	0	0
03-Aug-22	0	0	0	0
04-Aug-22	0	0	0	0
05-Aug-22	0	0	0	0
06-Aug-22	0	0	0	0
07-Aug-22	505.78	58.15	0	563.93
08-Aug-22	920.15	32.04	0	952.19
09-Aug-22	1130.93	144.96	0	1275.89
10-Aug-22	624.98	69.25	0	694.23
11-Aug-22	500.75	73	0	573.75
13-Aug-22	339.85	133.69	0	473.54
14-Aug-22	64.49	40.7	0	105.19
15-Aug-22	103.8	126.99	0	230.79
16-Aug-22	356.27	202.14	0	558.41
17-Aug-22	366.59	212.89	0	579.48
18-Aug-22	491.19	129.31	0	620.5
19-Aug-22	116.74	105.49	0	222.23
20-Aug-22	165.55	162.94	0	328.49
21-Aug-22	276.01	147.64	0	423.65
22-Aug-22	336.6	163.63	0	500.23
23-Aug-22	15.51	10.77	0	26.28
24-Aug-22	7.39	7.69	0	15.08
25-Aug-22	0	0	0	0
26-Aug-22	0	0	0	0
27-Aug-22	0	0	0	0
30-Aug-22	0	0	0	0
31-Aug-22	0	0	0	0
Grand Total				8143.86

B.E.S.&T. Undertaking DEPT.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-22	0	0	0	0
02-Aug-22	0	0	0	0
03-Aug-22	0	0	0	0
04-Aug-22	0	0	0	0
05-Aug-22	0	0	0	0
06-Aug-22	0	0	0	0
07-Aug-22	487.2	56.01	0	543.21
08-Aug-22	891.09	31.01	0	922.1
09-Aug-22	1095.2	140.39	0	1235.59
10-Aug-22	605.24	67.06	0	672.3
11-Aug-22	484.92	70.69	0	555.61
13-Aug-22	329.11	129.46	0	458.57
14-Aug-22	62.45	39.41	0	101.86
15-Aug-22	100.43	122.85	0	223.28
16-Aug-22	344.69	195.58	0	540.27
17-Aug-22	354.69	205.97	0	560.66
18-Aug-22	475.23	125.11	0	600.34
19-Aug-22	112.94	102.06	0	215
20-Aug-22	160.17	157.64	0	317.81
21-Aug-22	267.02	142.84	0	409.86
22-Aug-22	323.97	157.49	0	481.46
23-Aug-22	14.93	10.37	0	25.3
24-Aug-22	7.12	7.4	0	14.52
25-Aug-22	0	0	0	0
26-Aug-22	0	0	0	0
27-Aug-22	0	0	0	0
30-Aug-22	0	0	0	0
31-Aug-22	0	0	0	0
Grand Total				7877.74

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-22	0	0	0	0
02-Aug-22	0	0	0	0
03-Aug-22	0	0	0	0
04-Aug-22	0	0	0	0
05-Aug-22	0	0	0	0
06-Aug-22	0	0	0	0
07-Aug-22	471.71	54.23	0	525.94
08-Aug-22	862.75	30.03	0	892.78

13/6/23

B.E.S. & T. Undertaking

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IEX
INDIAN ENERGY EXCHANGE

09-Aug-22	1060.37	135.92	0	1196.29
10-Aug-22	585.99	64.93	0	650.92
11-Aug-22	469.5	68.44	0	537.94
13-Aug-22	318.64	125.35	0	443.99
14-Aug-22	60.47	38.16	0	98.63
15-Aug-22	97.24	118.94	0	216.18
16-Aug-22	333.73	189.36	0	523.09
17-Aug-22	343.41	199.42	0	542.83
18-Aug-22	460.12	121.13	0	581.25
19-Aug-22	109.36	98.8	0	208.16
20-Aug-22	155.08	152.62	0	307.7
21-Aug-22	258.53	138.3	0	396.83
22-Aug-22	313.67	152.48	0	466.15
23-Aug-22	14.45	10.04	0	24.49
24-Aug-22	6.89	7.16	0	14.05
25-Aug-22	0	0	0	0
26-Aug-22	0	0	0	0
27-Aug-22	0	0	0	0
30-Aug-22	0	0	0	0
31-Aug-22	0	0	0	0
Grand Total				7627.22

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-22	0	0	0	0
02-Aug-22	0	0	0	0
03-Aug-22	0	0	0	0
04-Aug-22	0	0	0	0
05-Aug-22	0	0	0	0
06-Aug-22	0	0	0	0
07-Aug-22	471.71	54.23	0	525.94
08-Aug-22	862.75	30.03	0	892.78
09-Aug-22	1060.37	135.92	0	1196.29
10-Aug-22	585.99	64.93	0	650.92
11-Aug-22	469.5	68.44	0	537.94
13-Aug-22	318.64	125.35	0	443.99
14-Aug-22	60.47	38.16	0	98.63
15-Aug-22	97.24	118.94	0	216.18
16-Aug-22	333.73	189.36	0	523.09
17-Aug-22	343.41	199.42	0	542.83
18-Aug-22	460.12	121.13	0	581.25
19-Aug-22	109.36	98.8	0	208.16
20-Aug-22	155.08	152.62	0	307.7

B.E.S. & T. Undertaking LEPP

13/6/23

*Computer generated report signature not required.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	September- 2022			
1	Gross Consumption		Quantum (Mus)	Remarks
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		329.807113	
		Sub Total (2)	**329.81**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**329.81**	
2	**RPO Obligation (19.50 % of GEC)**		**64.31**	

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B.E.S. & T. Undertaking
DEPT.

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	September- 2022			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.098816	Long Term PPA
		Sub Total (B)	**2.10**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.10**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

B.E.S. & T. Undertaking DEPP

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	October- 2022			
1	Gross Consumption		Quantum (Mus)	Remarks
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		365.843576	
		Sub Total (2)	**365.84**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**365.84**	
2	**RPO Obligation (19.50 % of GEC)**		**71.34**	

13/6/23

INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking DEPP

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	October- 2022			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.503653	Long Term PPA
		Sub Total (B)	**2.50**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.50**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0.00	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: - 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

B.E.S. & T. Undertaking DEPP

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	November- 2022			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		332.508806	
		Sub Total (2)	**332.51**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**332.51**	
2	**RPO Obligation (19.50 % of GEC)**		**64.84**	

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * BEPP *

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	November- 2022			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.565313	Long Term PPA
		Sub Total (B)	**2.57**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.57**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0.00	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE:- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking DEPP

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	December- 2022			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		327.473360	
		Sub Total (2)	**327.47**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0.00**	
	Total GEC for The Month (O+P-S)		**327.47**	
2	**RPO Obligation (19.50 % of GEC)**		**63.86**	

13/6/23

B.E.S. & T. Undertaking DEPP

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	December- 2022			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.504450	Long Term PPA
		Sub Total (B)	**2.50**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.50**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: - 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

B.E.S. & T. Undertaking ... DEPT.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	January- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
	Sub Total (1)		**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		260.329654	
	Sub Total (2)		**260.33**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
	Sub Total (3)		**0**	
	Total GEC for The Month (O+P-S)		**260.33**	
2	**RPO Obligation (19.50 % of GEC)**		**50.76**	

13/6/23

B.E.S. & T. Undertaking DEPP

Form III - Renewable Energy Procurement

	BEST Undertaking. Mumbai.			
	January- 2023			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.885478	Long Term PPA
		Sub Total (B)	**2.89**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.89**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

***NOTE: -** 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * DEPP *

	Form II - Gross Energy Consumption			
	BEST Undertaking. Mumbai.			
	February- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		281.885648	
		Sub Total (2)	**281.89**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**281.89**	
2	**RPO Obligation (19.50 % of GEC)**		**54.97**	

DWT
13/6/23

B.E.S. & T. Undertaking. DEPP

2/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	February- 2023			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.946628	Long Term PPA
		Sub Total (B)	**2.95**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.95**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: - *1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

B.E.S. & T. Undertaking DEPP

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	March- 2023			
1	Gross Consumption		Quantum (Mus)	Remarks
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	Nil	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		357.317748	
		Sub Total (2)	357.32	
S	Sale to other Licensee / Intermediaries			
	Source 1		Nil	
		Sub Total (3)	0	
	Total GEC for The Month (O+P-S)		357.32	
2	RPO Obligation (19.50 % of GEC)		69.68	

13/6/23

B.E.S. & T. Undertaking QEPP

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	March- 2023			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	3.270381	Long Term PPA
		Sub Total (B)	**3.27**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
E	RE Received from Net metered consumers for FY 2022-23		11.796648	
	Total GEC for The Month (A+B+C+E)-(D)		**15.07**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT

B.E.S.&T. Undertaking * OEPP

Quarterly updated details of Registered Self Use/CPPs above 1 MW to be submitted by DISCOM / PWD (Electrical) to MEDA

Discom:- BEST Undertaking. Mumbai FY- *2022-23*

Sr. No	Name of CPP unit (Self Use)	Address / Location of Self Use / CPP unit	Email-id / Contact details	Self Use CPP installed & generation capacity (in MW)	Registration No.	Registration date (DD/MM/YYYY)	Date of Commissioning (DD/MM/YYYY)	Source of generation (specify fuel type / technology)	Voltage level of grid connection) (in KV)	Grid connection status **(whether synchronised for parallel operation or not)**	Gross Energy Consumption from own generation (from CPP unit) (in MWh)	Host DISCOM (not necessary if location of CPP specified)	Consumer number	Meter location and meter type (marked on the Single Line Diagram to be provided)
1														
2							**NIL**							
3														
4														

Note: DISCOMs / PWD (Electrical) needs to submit above updated details for the quarter by first week of next quarter to MEDA.

Say: for April- June quarter-First week of July
for July- September quarter-First week of October for October- December quarter-First week of January for January- March quarter-First week of April

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * DEPP *

Quarterly updated details of Registered OA consumers having Contract demand 1MVA & above to be submitted by DISCOMs / SLDC to MEDA											
Discom:- BEST Undertaking. Mumbai									FY- *2022-23*		
Sr. No	Name of OA consumer	Address / location of OA consumer	Email-id / Contact details	Consumer No.	Capacity of Open Access (in MW) & period for Open Access	OA consumer contract demand (in KVA)	Consumer Voltage level (in KV)	Name & address of Generator Unit	Source of generation (specify fuel type/technology)	Generation Voltage level (in KV)	Energy wheeled under Open Access (Grossed up for losses) (in MWh)
1	NIL										
2											
3											
4											
N											

Note: DISCOMs/ SLDC needs to submit above updated details for the quarter by first week of next quarter to MEDA.

Say: for April- June quarter-First week of July
for July- September quarter-First week of October for October- December quarter-First week of January for January- March quarter-First week of April

13/6/23

B.E.S. & T. Undertaking DEPP

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

Compliance as per regulation 4.1(a) of MERC (Terms and Conditions for Determination of RE Tariff) Regulation 2015 for FY 2022-23

Sr. No.	Name of RE Generator	Date of Comm.	Contract Period		Type of Source	Details of source wise RE Contracted Capacity in MW				
			From	To		Qtr- I	Qtr-2	Qtr-3	Qtr-4	FY 2022-23
1	M/s. Walwhan Solar MH Limited.	04.10.13	25 years PPA		Solar-PV	20.00	20.00	20.00	20.00	20.00
	Total					**20.00**	**20.00**	**20.00**	**20.00**	**20.00**

13/6/23

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * DEPP *

Compliance as per Regulation 4.1(b) of MERC (Terms and Conditions for Determination of RE Tariff) Regulation 2015 for FY 2022-23.

Sr. No.	Name of RE Generator	Date of Commissing	Contract Period		Type of Source	Details of Purchase of RE in Mus				
			From	To		Qtr-I	Qtr-2	Qtr-3	Qtr-4	FY 2022-23
1	M/s. Walwhan Solar MH Limited.	04.10.13	25 years PPA		Solar-PV	8.40	6.05	7.57	9.10	31.13
2	Solar Power purchased from power Exchange (IEX)	-	-	-		5.04	24.09	0.00	0.00	29.13
3	Non SolarSolar Power purchased from power Exchange (IEX)					0.86	4.40	0.00	0.00	5.26
4	Solar Energy from Net Metered Consumers	-	01.04.22	31.03.23		-	-	-	-	11.80
Total Mus						14.30	34.55	7.57	9.10	77.31

13/6/23

B.E.S. & T. Undertaking DEPP

Annexure 11

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

TELEPHONE : (022) 22856262
FAX : (022) 22851244
TELEX : 1185755 BEST IN
TELEGRAM : BEST, MUMBAI-400 001.

BEST BHAVAN,
BEST MARG,
POST BOX NO. 192.
MUMBAI - 400 001.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

OUR REF. PP/MEDA/ RPO/2023-24 / 41 /2024

DATE : 24 MAY 2024

To,
General Manager (REC, RPO)
Maharashtra Energy Development Agency,
Government of Maharashtra
Aundh Road, Opposite Spicer College,
Near Commissionerate of Animal Husbandry,
PUNE – 411 067.
Email: - manrd@mahaurja.com

Sub:- Submission of final audited RPO achievement data of BEST for FY 2023-24 as per MERC (RPO Compliance & Implementation of REC framework) Regulations, 2019.

Ref: - Your email dated 03.04.2024

Sir,

With reference to your above referred email, we are submitting the final audited RPO achievement report for FY 2023-24. Necessary information is as below,

A. Gross Electricity Consumption and procurement of Renewable Energy for FY 2023-24 in the prescribed Form No. I, II, III.
B. CPP / OA consumer Data FY 2023-24.
C. Source wise contracted RE capacity addition in MW & details of RE procured in MUs for FY 2023-24.

Thanking you,

Yours faithfully,

(Satish A. Jadhav)
Divisional Engineer
Power Purchase

Encl: - As above

"BEST Travel Saves Fuel"

Gross Energy Consumption statement of BEST Undertaking FY 2023-24

Power Purchase for FY 2023-24	Energy at T<>D interface as per e-mail from SLDC dtd. 21.05.2024	Transmission Loss as per MSLDC	Grossed up Energy at G<>T as per SLDC Certification	Energy procured from Hydro source by BEST	GEC for Obligation
Month	MUs	%	MUs	MUs	MUs
Apr-23	426.831023	3.71	443.276584	83.090493	360.186091
May-23	471.646674	3.56	489.057107	85.945921	403.111186
Jun-23	468.031968	3.42	484.605475	67.547709	417.057766
Jul-23	401.183747	3.24	414.617349	72.321089	342.296260
Aug-23	420.916200	3.22	434.920645	84.690385	350.230260
Sep-23	411.549235	3.28	425.505826	58.526749	366.979077
Oct-23	460.521261	3.53	477.372511	60.761186	416.611325
Nov-23	412.567610	3.17	426.074161	52.678216	373.395945
Dec-23	382.445156	2.94	394.029627	56.917121	337.112506
Jan-24	353.569472	2.84	363.904356	57.316682	306.587674
Feb-24	341.127089	3.07	351.931382	49.336413	302.594969
Mar-24	393.672117	3.21	406.728089	68.497372	338.230717
TOTAL	**4944.061552**		**5112.023112**	**797.629336**	**4314.393776**

BEST Undertaking, MUMBAI

Form-I: RPO Settlement Account FY-2023-24

A - SOLAR

Gross Energy Consumption for Obligation (Excluding Hydro)		RPO Obligation (10.50%)	RPO % up to Previous month	RPO % Cumulative up to month (1)	**RE Purchase for the Month**		RE Purchase upto the Previous Month		RE Cumulative up to the Month (2)		**Short if any (1-2)**
					MU's		MU's		MU's		
Month	MU's	MU's	MU's	MU's	**Pref Tariff**	**REC**	Pref Tariff	REC	Pref Tariff	REC	**MU's**
Apr-23	360.186091	37.82	0.00	37.82	**4.495325**	**0.00**	0.00	0.00	4.50	0.00	**33.32**
May-23	403.111186	42.33	37.82	80.15	**4.683023**	**0.00**	4.50	0.00	9.18	0.00	**70.97**
Jun-23	417.057766	43.79	80.15	123.94	**4.088623**	**0.00**	9.18	0.00	13.27	0.00	**110.67**
Jul-23	342.296260	35.94	123.94	159.88	**2.613669**	**0.00**	13.27	0.00	15.88	0.00	**144.00**
Aug-23	350.230260	36.77	159.88	196.65	**3.867039**	**0.00**	15.88	0.00	19.75	0.00	**176.90**
Sep-23	366.979077	38.53	196.65	235.19	**3.488215**	**0.00**	19.75	0.00	23.24	0.00	**211.95**
Oct-23	416.611325	43.74	235.19	278.93	**4.122288**	**0.00**	23.24	0.00	27.36	0.00	**251.57**
Nov-23	373.395945	39.21	278.93	318.14	**3.483430**	**0.00**	27.36	0.00	30.84	0.00	**287.29**
Dec-23	337.112506	35.40	318.14	353.53	**3.485098**	**0.00**	30.84	0.00	34.33	0.00	**319.21**
Jan-24	306.587674	32.19	353.53	385.72	**3.932386**	**0.00**	34.33	0.00	38.26	0.00	**347.47**
Feb-24	302.594969	31.77	385.72	417.50	**5.425279**	**0.00**	38.26	0.00	43.68	0.00	**373.81**
Mar-24	338.230717	35.51	417.50	453.01	**4.499652**	**0.00**	43.68	0.00	48.18	0.00	**404.83**
TOTAL	**4314.393776**	**453.011346**			**48.184025**	**0.00**					**404.83**

B - Non-Solar

Gross Energy Consumption for Obligation (Excluding Hydro)		RPO Obligation (11.50%)	RPO % up to Previous month	RPO % Cumulative up to month (1)	**RE Purchase for the Month**		RE Purchase upto the Previous Month		RE Cumulative up to the Month (2)		**Short if any (1-2)**
					MU's		MU's		MU's		
Month	MU's	MU's	MU's	MU's	**Pref Tariff**	**REC**	Pref Tariff	REC	Pref Tariff	REC	**MU's**
Apr-23	360.186091	41.42	0.00	41.42	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**41.42**
May-23	403.111186	46.36	41.42	87.78	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**87.78**
Jun-23	417.057766	47.96	87.78	135.74	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**135.74**
Jul-23	342.296260	39.36	135.74	175.10	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**175.10**
Aug-23	350.230260	40.28	175.10	215.38	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**215.38**
Sep-23	366.979077	42.20	215.38	257.58	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**257.58**
Oct-23	416.611325	47.91	257.58	305.49	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**305.49**
Nov-23	373.395945	42.94	305.49	348.43	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**348.43**
Dec-23	337.112506	38.77	348.43	387.20	**0.00**	**0.00**	0.00	0.00	0.00	0.00	**387.20**
Jan-24	306.587674	35.26	387.20	422.46	**0.02**	**0.00**	0.00	0.00	0.02	0.00	**422.44**
Feb-24	302.594969	34.80	422.46	457.26	**0.42**	**0.00**	0.02	0.00	0.43	0.00	**456.83**
Mar-24	338.230717	38.90	457.26	496.16	**0.32**	**0.00**	0.42	0.00	0.75	0.00	**495.41**
TOTAL	**4314.393776**	**496.155284**			**0.75**	**0.00**					**495.41**

As per RPO-REC Regulation, 2019	
Solar	***10.50%***
Non Soalar	***11.50%***

Note:- We hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING ★ INTERNAL AUDIT DEPARTMENT ★

B.E.S. & T. Undertaking ★ बेस्ट ★ Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	April- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		360.186091	
		Sub Total (2)	**360.19**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S) for obligation		**360.19**	
2	**RPO Obligation (22.00 % of GEC)**		**79.24**	

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	April- 2023			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	3.116369	Long Term PPA
2	RE Generated from Net metered consumers		1.378956	
		Sub Total (B)	**4.50**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**4.50**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

B. E. S. & T. Undertaking बेस्ट Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	May- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
	Sub Total (1)		**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd.Excluding Hydro		403.111186	
	Sub Total (2)		**403.11**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
	Sub Total (3)		**0**	
	Total GEC for The Month (O+P-S)		**403.11**	
2	**RPO Obligation (22.00 % of GEC)**		**88.68**	

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * बेस्ट * Power Purchase Dept.

Form III - Renewable Energy Procurement				
	BEST Undertaking, Mumbai.			
	May- 2023			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	3.329350	Long Term PPA
2	RE Generated from Net metered consumers		1.353673	
		Sub Total (B)	**4.68**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**4.68**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		0	BEST not having own RE generation
		Sub Total (A)	**0**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0.00000	
		Sub Total (B)	**0.0000**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**0**	
	Total GEC for The Month (A+B+C)-(D)		**0.0000**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * Power Purchase Dept. * बेस्ट

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	June- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		417.057766	
		Sub Total (2)	**417.06**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**417.06**	
2	**RPO Obligation (22.00 % of GEC)**		**91.75**	

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * बेस्ट * Power Purchase Dept.

Form III - Renewable Energy Procurement

BEST Undertaking. Mumbai.

June- 2023

	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.994191	Long Term PPA
2	RE Generated from Net metered consumers		1.094432	
		Sub Total (B)	**4.09**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**4.09**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * बेस्ट * Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking, Mumbai.			
	July- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		342.296260	
		Sub Total (2)	**342.30**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**342.30**	
2	**RPO Obligation (22.00 % of GEC)**		**75.31**	

Form III - Renewable Energy Procurement

	BEST Undertaking, Mumbai.
	July- 2023

	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.009731	Long Term PPA
2	RE Generated from Net metered consumers		0.603938	
		Sub Total (B)	**2.61**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**2.61**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * Power Purchase Dept. * बेस्ट

Form II - Gross Energy Consumption				
	BEST Undertaking, Mumbai.			
	August- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		350.230260	
		Sub Total (2)	**350.23**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**350.23**	
2	**RPO Obligation (22.00 % of GEC)**		**77.05**	

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
INTERNAL AUDIT DEPARTMENT

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	August- 2023			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.668953	Long Term PPA
2	RE Generated from Net metered consumers		1.198086	
		Sub Total (B)	**3.87**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**3.87**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1			Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	September- 2023			
1	Gross Consumption		Quantum (Mus)	Remarks
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		366.979077	
		Sub Total (2)	**366.98**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**366.98**	
2	**RPO Obligation (22.00 % of GEC)**		**80.74**	

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking बेस्ट * Power Purchase Dept. *

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	September- 2023			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.412066	Long Term PPA
2	RE Generated from Net metered consumers		1.076149	
		Sub Total (B)	**3.49**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**3.49**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		Nil	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking बेस्ट Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	October- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		416.611325	
		Sub Total (2)	**416.61**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**416.61**	
2	**RPO Obligation (22.00 % of GEC)**		**91.65**	

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	October- 2023			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	3.050063	Long Term PPA
2	RE Generated from Net metered consumers		1.072225	
		Sub Total (B)	**4.12**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**4.12**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0.00	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * Power Purchase Dept. * बेस्ट

Form II - Gross Energy Consumption				
	BEST Undertaking, Mumbai.			
	November- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		373.395945	
		Sub Total (2)	**373.40**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**373.40**	
2	**RPO Obligation (22.00 % of GEC)**		**82.15**	

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
INTERNAL AUDIT DEPARTMENT

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Form III - Renewable Energy Procurement				
	BEST Undertaking, Mumbai.			
	November- 2023			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.386216	Long Term PPA
2	RE Generated from Net metered consumers		1.097214	
		Sub Total (B)	**3.48**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**3.48**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0.00	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: - 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking बेस्ट Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	December- 2023			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		337.112506	
		Sub Total (2)	**337.11**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0.00**	
	Total GEC for The Month (O+P-S)		**337.11**	
2	**RPO Obligation (22.00 % of GEC)**		**74.16**	

B. E. S. & T. Undertaking बेस्ट Power Purchase Dept.

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	December- 2023			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.536569	Long Term PPA
2	RE Generated from Net metered consumers		0.948529	
		Sub Total (B)	**3.49**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**3.49**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Nil		0	
		Sub Total (B)	**0.00**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.00**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * बेस्ट * Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	January- 2024			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
	Sub Total (1)		**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		306.587674	
	Sub Total (2)		**306.59**	
S	Sale to other Licensee / Intermediaries			
	Source 1		0	
	Sub Total (3)		**0**	
	Total GEC for The Month (O+P-S)		**306.59**	
2	**RPO Obligation (22.00 % of GEC)**		**67.45**	

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	January- 2024			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchaase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.910041	Long Term PPA
2	Solar Energy purchased from Power Exchange		0.033440	
3	RE Generated from Net metered consumers		0.988905	
		Sub Total (B)	**3.93**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		Nil	
		Sub Total (D)	**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**3.93**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Non Solar Energy purchased from Power Exchange		0.01534	
		Sub Total (B)	**0.02**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.02**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking बेस्ट Power Purchase Dept.

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : January-2024 Issued on : 01/02/2024

Portfolio Name: **BEST**

This is certified that BEST has purchased 50.79 MWh (at regional periphery) of Renewable Energy for the period 01/01/2024 to 31/01/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
34.83	15.96	0	50.79

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * बेस्ट * Power Purchase Dept.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
18-Jan-24	2.03	0.65	0	2.68
19-Jan-24	0	0	0	0
20-Jan-24	0	0	0	0
21-Jan-24	32.8	7.2	0	40
22-Jan-24	0	0	0	0
23-Jan-24	0	0	0	0
24-Jan-24	0	0	0	0
25-Jan-24	0	0	0	0
26-Jan-24	0	0	0	0
27-Jan-24	0	0	0	0
28-Jan-24	0	0	0	0
29-Jan-24	0	0	0	0
30-Jan-24	0	8.11	0	8.11
31-Jan-24	0	0	0	0
Grand Total				50.79

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
18-Jan-24	1.95	0.62	0	2.57
19-Jan-24	0	0	0	0
20-Jan-24	0	0	0	0
21-Jan-24	31.49	6.91	0	38.4
22-Jan-24	0	0	0	0
23-Jan-24	0	0	0	0
24-Jan-24	0	0	0	0
25-Jan-24	0	0	0	0
26-Jan-24	0	0	0	0
27-Jan-24	0	0	0	0

*Computer generated report signature not required.

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

B. E. S. & T. Undertaking बेस्ट Power Purchase Dept.

28-Jan-24	0	0	0	0
29-Jan-24	0	0	0	0
30-Jan-24	0	7.81	0	7.81
31-Jan-24	0	0	0	0
Grand Total				48.78

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
18-Jan-24	1.88	0.6	0	2.48
19-Jan-24	0	0	0	0
20-Jan-24	0	0	0	0
21-Jan-24	30.49	6.69	0	37.18
22-Jan-24	0	0	0	0
23-Jan-24	0	0	0	0
24-Jan-24	0	0	0	0
25-Jan-24	0	0	0	0
26-Jan-24	0	0	0	0
27-Jan-24	0	0	0	0
28-Jan-24	0	0	0	0
29-Jan-24	0	0	0	0
30-Jan-24	0	7.56	0	7.56
31-Jan-24	0	0	0	0
Grand Total				47.22

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
18-Jan-24	1.88	0.6	0	2.48
19-Jan-24	0	0	0	0
20-Jan-24	0	0	0	0
21-Jan-24	30.49	6.69	0	37.18
22-Jan-24	0	0	0	0
23-Jan-24	0	0	0	0
24-Jan-24	0	0	0	0
25-Jan-24	0	0	0	0
26-Jan-24	0	0	0	0
27-Jan-24	0	0	0	0
28-Jan-24	0	0	0	0
29-Jan-24	0	0	0	0
30-Jan-24	0	7.56	0	7.56
31-Jan-24	0	0	0	0
Grand Total				47.22

*Computer generated report signature not required.

B. E. S. & T. Undertaking बेस्ट Power Purchase Dept.

Form II - Gross Energy Consumption				
	BEST Undertaking. Mumbai.			
	February- 2024			
1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		302.594969	
		Sub Total (2)	**302.59**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**302.59**	
2	**RPO Obligation (22.00 % of GEC)**		**66.57**	

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
INTERNAL AUDIT DEPARTMENT

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	February- 2024			
	RE Sources Detail (Solar)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	2.973972	Long Term PPA
2	Solar Energy purchased from Power Exchange		1.346360	
3	RE Generated from Net metered consumers		1.104947	
		Sub Total (B)	**5.43**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Sub Total (D)			
	Total GEC for The Month (A+B+C)-(D)		**5.43**	

	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Non Solar Energy purchased from Power Exchange		0.41566	
		Sub Total (B)	**0.42**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.42**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT

B. E. S. & T. Undertaking बेस्ट Power Purchase Dept.

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : February-2024 Issued on : 01/03/2024

Portfolio Name: **BEST**

This is certified that BEST has purchased 1830.05 MWh (at regional periphery) of Renewable Energy for the period 01/02/2024 to 29/02/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
1398.3	429.27	2.48	1830.05

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

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IEX
INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Feb-24	0	0	0	0
02-Feb-24	0	0	0	0
03-Feb-24	0	0	0	0
04-Feb-24	0	0	0	0
05-Feb-24	0	0	0	0
06-Feb-24	94.09	21.41	0	115.5
07-Feb-24	121.61	26.65	0	148.26
08-Feb-24	133.8	164.5	1.32	299.62
09-Feb-24	45.21	6.24	0	51.45
10-Feb-24	25.86	4.32	0	30.18
11-Feb-24	0	0	0	0
12-Feb-24	106.22	33.78	0	140
13-Feb-24	86.57	21.91	0	108.48
14-Feb-24	94.9	15.4	0	110.3
15-Feb-24	90.19	9.91	0	100.1
16-Feb-24	94.28	41.5	0.01	135.79
17-Feb-24	79.37	16.47	0	95.84
19-Feb-24	150.02	28.73	0	178.75
20-Feb-24	91.04	12.34	1.15	104.53
24-Feb-24	185.14	26.11	0	211.25
Grand Total				1830.05

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Feb-24	0	0	0	0
02-Feb-24	0	0	0	0
03-Feb-24	0	0	0	0
04-Feb-24	0	0	0	0

*Computer generated report signature not required.

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking बेस्ट Power Purchase Dept.

INDIAN ENERGY EXCHANGE

05-Feb-24	0	0	0	0
06-Feb-24	90.56	20.61	0	111.17
07-Feb-24	117.05	25.65	0	142.7
08-Feb-24	128.79	158.33	1.27	288.39
09-Feb-24	43.51	6.01	0	49.52
10-Feb-24	24.89	4.16	0	29.05
11-Feb-24	0	0	0	0
12-Feb-24	102.25	32.52	0	134.77
13-Feb-24	83.34	21.09	0	104.43
14-Feb-24	91.35	14.83	0	106.18
15-Feb-24	86.82	9.54	0	96.36
16-Feb-24	90.75	39.96	0	130.71
17-Feb-24	76.4	15.86	0	92.26
19-Feb-24	144.55	27.68	0	172.23
20-Feb-24	87.71	11.89	1.11	100.71
24-Feb-24	178.39	25.15	0	203.54
Grand Total				1762.02

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Feb-24	0	0	0	0
02-Feb-24	0	0	0	0
03-Feb-24	0	0	0	0
04-Feb-24	0	0	0	0
05-Feb-24	0	0	0	0
06-Feb-24	87.68	19.95	0	107.63
07-Feb-24	113.33	24.83	0	138.16
08-Feb-24	124.69	153.29	1.23	279.21
09-Feb-24	42.13	5.82	0	47.95
10-Feb-24	24.09	4.03	0	28.12
11-Feb-24	0	0	0	0
12-Feb-24	99	31.48	0	130.48
13-Feb-24	80.68	20.42	0	101.1
14-Feb-24	88.45	14.35	0	102.8
15-Feb-24	84.05	9.24	0	93.29
16-Feb-24	87.86	38.68	0.01	126.55
17-Feb-24	73.97	15.36	0	89.33
19-Feb-24	139.95	26.8	0	166.75
20-Feb-24	84.92	11.51	1.07	97.5
24-Feb-24	172.72	24.34	0	197.06
Grand Total				1705.93

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

*Computer generated report signature not required.

Form II - Gross Energy Consumption

BEST Undertaking. Mumbai.

March- 2024

1	**Gross Consumption**		**Quantum (Mus)**	**Remarks**
O	Own Generation			
	Source 1		Nil	BEST not having own generation
	Source 2		Nil	
	Source N		Nil	
		Sub Total (1)	**Nil**	
P	Purchaase from other Generating Company			
	TATA Power Co (G) & Manikaran Power Ltd. Excluding Hydro		338.230717	
		Sub Total (2)	**338.23**	
S	Sale to other Licensee / Intermediaries			
	Source 1		**Nil**	
		Sub Total (3)	**0**	
	Total GEC for The Month (O+P-S)		**338.23**	
2	**RPO Obligation (22.00 % of GEC)**		**74.41**	

Form III - Renewable Energy Procurement				
	BEST Undertaking. Mumbai.			
	March- 2024			
	RE Sources Detail (SOLAR)			
A	Own Generation			BEST not having own RE generation
	RE-1		0	
		Sub Total (A)	**0**	
B	Purchase from other RE Source / Licensee			
1	Walwhan Solar MH Limited	Solar PV	1.112481	Long Term PPA
2	Solar Energy purchased from Power Exchange		1.953530	
3	RE Generated from Net metered consumers		1.433641	
		Sub Total (B)	**4.499652**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		0	
		Sub Total (D)	**0**	
	Total GEC for The Month (A+B+C)-(D)		**4.499652**	
	RE Sources Detail (Non Solar)			
A	Own Generation		Quantam (Mus)	Remarks
	RE-1		Nil	BEST not having own RE generation
		Sub Total (A)	**Nil**	
B	RE Source (Type of RE)	Source	Quantam (Mus)	Remarks
1	Non Solar Energy purchased from Power Exchange		0.319170	
		Sub Total (B)	**0.319170**	
C	Purchase through REC		**0.00**	
D	RE Sold to other Person		**Nil**	
	Total GEC for The Month (A+B+C)-(D)		**0.319170**	

NOTE: *- 1. Above Energy as per Generation Credit Note, Joint meter reading certified by MSEDCL/MSETCL & Yet to be Accounted in FBSM bill.*

2. WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy & R.E procurement data of CPP / OA consumers on our network

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B. E. S. & T. Undertaking * बेस्ट * Power Purchase Dept.

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : March-2024 **Issued on :** 01/04/2024

Portfolio Name: **BEST**

This is certified that BEST has purchased 2350.23 MWh (at regional periphery) of Renewable Energy for the period 01/03/2024 to 31/03/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
2020.16	303.2	26.87	2350.23

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

B.E.S. & T. Undertaking * बेस्ट * Power Purchase Dept.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
11-Mar-24	0	0	0	0
12-Mar-24	0	0	0	0
13-Mar-24	0	0	0	0
27-Mar-24	384.87	56.14	2.49	443.5
28-Mar-24	473.45	51.23	5.32	530
29-Mar-24	539.81	60.7	4.49	605
30-Mar-24	415.1	120.07	12.81	547.98
31-Mar-24	206.93	15.06	1.76	223.75
Grand Total				2350.23

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
11-Mar-24	0	0	0	0
12-Mar-24	0	0	0	0
13-Mar-24	0	0	0	0
27-Mar-24	372.16	54.3	2.41	428.87
28-Mar-24	457.84	49.53	5.14	512.51
29-Mar-24	522.01	58.69	4.35	585.05
30-Mar-24	401.4	116.11	12.38	529.89
31-Mar-24	200.12	14.55	1.71	216.38
Grand Total				2272.7

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
11-Mar-24	0	0	0	0
12-Mar-24	0	0	0	0
13-Mar-24	0	0	0	0

*Computer generated report signature not required.

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking बेस्ट Power Purchase Dept.

INDIAN ENERGY EXCHANGE

27-Mar-24	360.33	52.57	2.33	415.23
28-Mar-24	443.26	47.96	4.97	496.19
29-Mar-24	505.41	56.82	4.21	566.44
30-Mar-24	388.63	112.41	12	513.04
31-Mar-24	193.74	14.1	1.65	209.49
Grand Total				2200.39

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
11-Mar-24	0	0	0	0
12-Mar-24	0	0	0	0
13-Mar-24	0	0	0	0
27-Mar-24	360.33	52.57	2.33	415.23
28-Mar-24	443.26	47.96	4.97	496.19
29-Mar-24	505.41	56.82	4.21	566.44
30-Mar-24	388.63	112.41	12	513.04
31-Mar-24	193.74	14.1	1.65	209.49
Grand Total				2200.39

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING ★ INTERNAL AUDIT DEPARTMENT

Power Purchase Dept.

*Computer generated report signature not required.

Compliance as per regulation 4.1(a) of MERC (Terms and Conditions for Determination of RE Tariff) Regulation 2015 for FY 2023-24

Sr. No.	Name of RE Generator	Date of Comm.	Contract Period		Type of Source	Details of source wise RE Contracted Capacity in MW				
			From	To		Qtr- I	Qtr-2	Qtr-3	Qtr-4	FY 2023-24
1	M/s. Walwhan Solar MH Limited.	04.10.13	25 years PPA		Solar-PV	20.00	20.00	20.00	20.00	20.00
	Total					**20.00**	**20.00**	**20.00**	**20.00**	**20.00**

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
INTERNAL AUDIT DEPARTMENT

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Compliance as per Regulation 4.1(b) of MERC (Terms and Conditions for Determination of RE Tariff) Regulation 2015 for FY 2023-24.

Sr. No.	Name of RE Generator	Date of Commissioning	Contract Period		Type of Source	Details of Purchase of RE in Mus				
			From	To		Qtr-I	Qtr-2	Qtr-3	Qtr-4	FY 2023-24
1	M/s. Walwhan Solar MH Limited.	04.10.13	25 years PPA		Solar-PV	9.44	7.09	7.97	7.00	31.50
2	Solar Power purchased from power Exchange (IEX)	-	-	-		0.00	0.00	0.00	3.33	3.33
3	Non SolarSolar Power purchased from power Exchange (IEX)	-	-	-		0.00	0.00	0.00	0.75	0.75
4	Solar Energy Generation from Net Metered Consumers	-	01.04.23	31.03.24		3.83	2.88	3.12	3.53	13.35
Total Mus						**13.27**	**9.97**	**7.97** 11.09	**7.00** 14.61	**48.93**

Quarterly updated details of Registered OA consumers having Contract demand 1MVA & above to be submitted by DISCOMs / SLDC to MEDA

Discom:- BEST Undertaking. Mumbai FY- 2023-24

Sr. No	Name of OA consumer	Address / location of OA consumer	Email-id / Contact details	Consumer No.	Capacity of Open Access (in MW) & period for Open Access	OA consumer contract demand (in KVA)	Consumer Voltage level (in KV)	Name & address of Generator Unit	Source of generation (specify fuel type/technology)	Generation Voltage level (in KV)	Energy wheeled under Open Access (Grossed up for losses) (in MWh)
1	NIL										
2											
3											
4											
N											

Note: DISCOMs/ SLDC needs to submit above updated details for the quarter by first week of next quarter to MEDA.

Say: for April- June quarter-First week of July
for July- September quarter-First week of October for October- December quarter-First week of January for January- March quarter-First week of April

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING ★ INTERNAL AUDIT DEPARTMENT ★

B. E. S. & T. Undertaking ★ बेस्ट ★ Power Purchase Dept.

Quarterly updated details of Registered Self Use/CPPs above 1 MW to be submitted by DISCOM / PWD (Electrical) to MEDA														
Discom:- BEST Undertaking. Mumbai									FY- 2023-24					
Sr. No	Name of CPP unit (Self Use)	Address / Location of Self Use / CPP unit	Email-id / Contact details	Self Use CPP installed & generation capacity (in MW)	Registration No.	Registration date (DD/MM/YYYY)	Date of Commissioning (DD/MM/YYYY)	Source of generation (specify fuel type / technology)	Voltage level of grid connection) (in KV)	Grid connection status **(whether synchronised for parallel operation or not)**	Gross Energy Consumption from own generation (from CPP unit) (in MWh)	Host DISCOM (not necessary if location of CPP specified)	Consumer number	Meter location and meter type (marked on the Single Line Diagram to be provided)
1	**NIL**													
2														
3														
4														
Note: DISCOMs / PWD (Electrical) needs to submit above updated details for the quarter by first week of next quarter to MEDA.														
Say: for April- June quarter-First week of July for July- September quarter-First week of October for October- December quarter-First week of January for January- March quarter-First week of April														

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING ★ INTERNAL AUDIT DEPARTMENT ★

B. E. S. & T. Undertaking ★ बेस्ट ★ Power Purchase Dept.

O/c.

Annexure 12

Copy – DEPM 8/2/22
SPM-1

Free Press Journal
7/02/2022

The Brihanmumbai Electric Supply & Transport Undertaking
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

BEST

NOTICE INVITING E-TENDER

Brihanmumbai Electric Supply & Transport Undertaking (BEST) invites bids for purchase of power on short term basis for the month of April, 2022 to June, 2022 through National e-bidding process.

The bid document for participation can be downloaded through DEEP e-portal of **www.mstcecommerce.com** from **10:00 hrs of 07.02.2022.** Bids must be submitted online through this portal on or before **17:00 hrs of 11.02.2022**. Any corrigendum will be published on the referred website only.

PRO/DEPM/119/2022

General Manager
BEST Undertaking

Business Standard
7/02/2022

The Brihanmumbai Electric Supply & Transport Undertaking
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

BEST

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PRO/DEPM/119/2022

General Manager
BEST Undertaking

THE BRIHANMUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING
(OF THE BRIHANMUMBAI MAHANAGAR PALIKA)

Tender No: BEST/Short/21-22/ET/125 & BEST/Short/21-22/RA/117

Bid Document

For

Purchase of Power

Through

E-Tendering and E-Reverse Auction Basis

By

Brihanmumbai Electric Supply & Transport Undertaking

Date: 07.02.2022

INVITATION FOR e-TENDER

Sr. No.	Event	Date/Time
1.	Publication of Bid Document/ Activation of Event	**07.02.2022 at 10:00 hrs.**
2.	Last date of submission of Bids including EMD	**11.02.2022 at 17:00 hrs.**
3.	Opening of Non-financial Technical Bids	**14.02.2022 at 10:00 hrs**
4.	Opening of IPOs	**16.02.2022 at 10:00 hrs**
5.	Start of e-Reverse Auction	**16.02.2022 at 12:00 hrs**

Bids to be submitted through	**DEEP e-bidding portal at www.mstcecommerce.com**
Office inviting Bids and place of submission of EMD	**Divisional Engineer, Power Management Department, BEST Undertaking, 1st Floor, Multi-storied Building Annex. BEST Marg, Colaba, Mumbai-400001 Tel:- 022-22799555 e-mail:- depower@bestundertaking.com**

1. INTRODUCTION AND BACKGROUND:-

Brihanmumbai Electric Supply & Transport Undertaking, here in after referred to as the **“BEST”**, a Distribution Licensee supplying electricity in the Mumbai City is inviting bids for procurement of power under Short Term arrangement for the month of April, 2022 to June, 2022 to meet its demand as per Terms and Conditions of this Bid Document (**Annexure-I**).

Bids are invited from various trading licensees / generators / state utilities / CPPs / Distribution licensees / SEBs for purchase of power. The power would be procured in line with“ Guide lines for short-term (i.e. for a period of more than one day to one year) Procurement of Power by Distribution Licensees through Tariff based bidding process” issued by Government of India - Ministry of Power under Section 63 of the Electricity Act, 2003 and as amended from time to time. The responsibility of the Successful Bidder(s) would be to supply power to BEST as per the terms and conditions of the Bid Document.

All the interested Bidders shall participate in the bidding process by downloading Bid Document from DEEP e-bidding Portal. The link of e-bidding Portal is **www.mstcecommerce.com**. Bidder needs to register on the e-bidding portal on MSTC website.

2. E-bidding FEE:-

All the Bidders would be able to participate in the e-bidding events on making payment of the requisite fees of Rs.500 per MW per requisition for the total capacity sought for that particular requisition for which a Bidder is willing to bid to PFC Consulting Limited (PFCCL). The requisite fee plus applicable taxes shall be deposited through the portal by e-Payment Gateway provided by MSTC Ltd. After the completion of the bidding process, only successful Bidder(s) will have to pay these charges for the quantum allocated to each Bidder. The balance amount will be refunded by PFCCL within seven (7) working days without any interest. The fee deposited by non-selected Bidder(s) will also be refunded by PFCCL within seven (7) working days of completion of the event without any interest.

3. Quantum of Power:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement for the month of April, 2022 to June, 2022 from various sources. The Bidder(s) shall supply power as mentioned below to BEST:

<table>
<tr><th rowspan="3">Requisition No.</th><th colspan="2" rowspan="2">Contract Period</th><th colspan="3">Slot/ Time</th><th rowspan="3">Quantum (in MW)</th><th rowspan="3">Minimum Bid Quantity (in MW)</th><th rowspan="3">Delivery Point</th></tr>
<tr><th colspan="3">(Hrs.)</th></tr>
<tr><th>From</th><th>To</th><th>From</th><th></th><th>To</th></tr>
<tr><td>1</td><td>01-Apr-22</td><td>30-Apr-22</td><td>09:00</td><td>To</td><td>17:00</td><td>100</td><td>20</td><td>Maharashtra STU Periphery</td></tr>
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</table>

The Bidder(s) should be capable to supply power to BEST during the contracted period at the delivery point, for which the responsibility will be of the Bidder(s). Bider/s shall ensure necessary infrastructure/ground work in this regard, while participating in the Bid.

4. Qualification Criteria:-

a. All the generators/state utilities /CPPs /Distribution Licensees /SEBs and trading licensees having valid trading license from Appropriate Commission are qualified to participate in the bidding process.

b. The Bidder must quote not less than Minimum Bid Quantity, as mentioned in the table above, from single source of generation.

c. If Bidder being an electricity trading licensee, then the trader(s) should submit a valid license from CERC/SERC for Inter-state /Intra-state trading of electricity. The trader shall also attach a photocopy of the same along with the Bid.

5. Submission of Bid:-

The Bidders shall submit their Bids on-line, through DEEP e-bidding portal only.

A) Non-Financial Bid Comprising of:

a) Acceptance to Terms and Conditions of Bid document (**Annexure-II**).

b) Bid Security (EMD) in the form of Bank Guarantee issued by any Nationalized/Scheduled Bank.

c) Source from which Bidder shall supply power shall be mentioned.

d) In case Bidder is Trader, scanned copy of valid Trading license from appropriate Commission should also be provided.

e) Copy of the authorization received from the Generator (in case of trader).

f) Board resolution/Authorization for signing the Bid document.

B) Financial Bid:-

Bidders shall be required to submit separate non-financial technical Bids and Financial Bids i.e. Initial Price Offer (IPO) as per the following time-table:-

Event	**Date and time**
Date of publication of Bid document / Activation of Event	**07.02.2022 at 10:00 hrs.**
Submission of Bid (online Digitally signed non-financial technical bid & IPOs)	**11.02.2022 at 17:00 hrs.**
Opening of Non-Financial Technical Bids	**14.02.2022 at 10:00 hrs**
Clarification, if any, sought from bidders	**15.02.2022 at 17:00 hrs**
Opening of IPOs	**16.02.2022 at 10:00 hrs**
Start of e-Reverse Auction	**16.02.2022 at 12:00 hrs**
Submission of Application for Open Access	**As per Open Access procedure/regulations**
Approval and Obtaining SLDC consent by the seller/purchaser.	

Note: BEST may extend the timelines of Bid with intimation to all Bidders through DEEP e-bidding portal only.

The Bidders are required to upload scanned copy of the EMD along with the Bid and the original copy of EMD to be sent so as to reach the address as given below on or before **17:00 hrs of 11.02.2022**:

Divisional Engineer,
Power Management Department,
BEST Undertaking,
1st Floor, Multi-storied Building Annex.
BEST Marg, Colaba,
Mumbai-400001.
Tel:- 022-22799555

6. BIDDING PROCESS:-

a. The Bidder shall use one Digital Signature to submit bid through one login and for each e-bidding event shall comprise of two parts i.e. e-Tender and e-Reverse Auction. An event may have multiple requisitions (i.e. independent requirements of power at different time or places). To participate in the event, each Bidder will have to specify the source of power for that particular bid. Each bid will have only one price per requisition accompanied by the total quantum of power the Bidder intends to supply and minimum threshold quantum acceptable to the Bidder. However, the Bidder shall have the option to choose the requisition of an event in which it intends to participate. Each of the Bids will have to be signed by the Digital signature of the Bidder.

b. Each login the bidder may submit only one price bid from one source. However, against each requisition the Bidder have the option to bid multiple bids from separate login either from same or different sources.

c. The Bidder shall quote the single tariff at delivery point up to three (3) decimals which shall include capacity charge, energy charge, trading margin (in case of Bidder being a Trader) and all taxes, duties, cess, levies etc. Open Access charges up to delivery point shall be borne by the Bidder. The price quoted shall not change in case if any tax/ duty/ levy/cess/charges become applicable after the submission of Bids. The tariff should be constant and there shall be no escalation during the contractual period.

d. Each event of the auction would require independent Digital Signature of the Bidder.

e. Bidders shall be required to submit separate non-financial technical Bid and Financial Bids i.e. Initial Price Offer (IPO) through e-bidding portal.

f. The Bidders can revise their IPOs before date and time of submission of Bid Document.

g. After acceptance of the non-financial technical Bids, the Financial Bids shall be opened as per schedule given in Event time table.

h. In the event, if two or more Bidders quote the same amount of Tariff during IPO and e-Reverse Auction stage, the time of submission of Bid will be the deciding factor for their ranking.

i. The elimination of the Bidders shall be done by the following method:

1) After the opening of Initial Price Offers, the system will rank the Bidders according to their price bids. The Bidder with the highest price bid in IPO stage will be called the H1 Bidder. The system will then analyze all the quantities offered by the Bidders in the IPO stage. If the total quoted quantity is greater than twice the Requisitioned Quantity, the Highest Bidder (H1) will be eliminated provided that the total quoted quantity after elimination is not less than or equal to twice the Requisitioned Quantity.

2) The Elimination process will be done for each of the requisition separately.

3) The shortlisted Bidder after elimination will be intimated individually by system

generated emails only.

j. The Reverse auction will start within 120 minutes of opening of Initial Price Offers and shall continue for a period of next 120 minutes.

k. Provided that during the last 10 (ten) minutes before the scheduled close time of e-Reverse auction, if a price bid is received which is lower than the lowest prevailing price bid recorded in the system during e-Reverse auction, the close time of e- Reverse auction will be automatically extended by 10 (ten) minutes from the time of the last price bid received. This process of auto-extension will continue till there is a period of 10 (ten) minutes during which no price bid are received which is lower than the prevailing lowest price bid.

l. During the Reverse Auction the Bidders will have the option of reducing the tariff quoted by them in decrements of one paisa or multiples thereof and to increase the quantum quoted by them by 1 MW or multiples thereof. During the Reverse Auction the prevailing Lowest Tariff would be visible to all the Bidders.

m. The Bidders will have the option to increase the quantum of power upto corresponding to the value of EMD submitted along with IPO, but decrease the Tariff during the e-Reverse Auction process.

7. Contract Documents:-

BEST shall intimate to Bidder(s) regarding award of contract for supply of power (whose Bid has been accepted) through a Letter of Intent (LoI).

8. Compliance to the Terms & Conditions:-

The Bidders are advised to ensure that the Bid is fully compliant with the requirements specified and terms and conditions contained in the Bid Document. No deviation from these conditions is permissible and a Bid with any deviation shall be summarily rejected.

9. Earnest Money Deposit (EMD):-

a. The Bidder shall be required to submit EMD of Rs. 30,000 per MW per Month (for 30 days, 24 hours and same shall be reduced on pro-rata basis) of offered capacity in the form of Bank Guarantee (Format Enclosed-**Annexure-III**) issued by any Nationalized/Scheduled Bank in favour of “The General Manager, Brihanmumbai Electric

Supply & Transport Undertaking" payable at Mumbai, **valid till 31.03.2022**.

Example: For a requirement of 2 MW for 15 days for 4 hours, the EMD shall be = Rs. 30,000 x 2 MW x (15 days/30 days) x (4 hrs/24 hrs) = Rs. 5000/-

All costs/expenses/charges associated with the bidding, including bank guarantee etc. shall be borne by the Bidder. The validity of the EMD shall be extended by the Bidder if required by BEST.

BEST's bank details are as follows:
Name: BEST Undertaking
Account No.: 0106261008935
Name of Bank: Canara Bank
Branch name: Colaba
IFSC Code: CNRB0000106

b. The EMD shall be forfeited,

- If Bidder withdraws or modifies bid during Bid Validity Period.
- If Bidder fails to supply power after issue of Letter of Intent (LoI).
- Bidder failure in performing its contractual obligations.
- For Non submission of Contract Performance Guarantee by successful bidder.

c. The EMD of successful Bidder shall be released after submission of Contract Performance Guarantee as per Clause No. 10 below.

d. The EMD of unsuccessful bidder shall be released within 15 days from date of expiry of Bid validity period.

e. If it is observed that EMD of Bidder(s) has not been submitted or is less than the specified amount, the bid shall be rejected and Financial Bid submitted by such a Bidder shall not be opened.

No interest shall be paid on the Earnest Money Deposit.

10. Contract Performance Guarantee (CPG):-

a. Successful bidders are required to produce CPG within 7 days from date of Issue of Letter of Intent (LoI) to successful bidder for an amount of Rs 2 Lac per MW per Month (for 30 days, 24 hours) of contract period or part thereof. The CPG for the procurement of power on hourly basis shall be calculated on pro-rata basis as per the example given above for calculating EMD.

b. CPG to be issued by Nationalized/ Scheduled bank and valid for the period of contract and 1 month post expiry of contract. All costs/expenses/charges associated with CPG shall be borne by the Bidder. Refer Clause 9 above for BEST's bank details.

c. In case of CPG submission delay within stipulated period, Bid security i.e. EMD shall be forfeited.

d. CPG to be released after 30 days of completion of contract period.

e. The CPG provided by the successful bidder shall be forfeited for not performing the contractual obligations.

11. BEST's right- Acceptance/Rejection of Bid:-

This Bid document may be withdrawn or cancelled by BEST at any time without assigning any reasons thereof. BEST further reserves the right, at its complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account. The entire bidding process is subject to approval of Maharashtra Electricity Regulatory Commission.

12. Modification of the Bid Document:-

BEST reserves the right to modify any part of the Bid Document by issuing one or more amendments prior to the last date of submission of the Bid ("Amendment").

Any Amendment shall form part of the Bid Document, and shall be binding on bidders.

Any corrigendum/ clarifications with the Bid document and/or the Bidding process shall be published on the DEEP e-bidding portal only.

13. Bid Validity Period:-

The validity period of offer of Bidder shall be till **31.03.2022.**

14. Governing Law:-

All matters arising out of or in conjunction with the Bid Document and/or the bidding process shall be governed by and construed in accordance with Indian Law and the courts of Mumbai, Maharashtra shall have exclusive jurisdiction.

15. Condition Precedent:-

The Award of Contract i.e. Letter of Intent (LoI) is subject to approval, clearances, and permissions from all authorities i.e. Maharashtra State Electricity Regulatory Commission, RLDC / SLDCs etc.

16. Disclaimer:-

Neither BEST nor its employees or consultants shall be liable to any Bidder or any other person under any law including the law of contract, tort, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage which may arise, or be incurred, or suffered, in connection with the Bid, or any matter that may be deemed to form part of the Bid document or any other information supplied by or on behalf of BEST or its employees or consultants. For the avoidance of doubt it is expressly clarified that this Bid Document is an offer to Bid and is subject to the award of Letter of Intent (LoI) by BEST.

****

<u>Annexure-I</u>

General Terms and Conditions

1. Quantum:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement. The Bidder(s) shall supply power as mentioned below to BEST:

<table>
<tr><th rowspan="3">Requisition No.</th><th colspan="2" rowspan="2">Contract Period</th><th colspan="3">Slot/ Time</th><th rowspan="3">Quantum (in MW)</th><th rowspan="3">Minimum Bid Quantity (in MW)</th><th rowspan="3">Delivery Point</th></tr>
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</table>

2. Delivery Point:-

The interface of Transmission network of Maharashtra State (i.e. Maharashtra STU Periphery).

3. Open Access Charges, transmission Losses and other Charges:-

All Open Access charges i.e. Transmission charges & losses, POC injection /withdrawal charges and losses, reliability support charges, Scheduling & operating charges of RLDC/SLDC, RLDC application fee or any other charges/fees upto delivery point shall be borne by the Bidder. The Open Access charges beyond delivery point (i.e. Maharashtra State Scheduling charges and Application charges) shall also be borne by the Bidder. Any revision in these charges if become applicable after the submission of Bids shall be on account of the Bidder.

BEST is a Long-Term Transmission System user of Maharashtra State. Hence, Maharashtra State transmission (InSTS) charges and losses are not applicable. Therefore, bidders while quoting need not factor Maharashtra State Transmission charges and Losses.

BEST does not have any Interstate LTOA/MTOA contract. Same may be factored in while quoting tariff and during application for Open Access.

If the power is being supplied through alternate source, additional charges and losses if any, due to cancellation of existing corridor and booking of new corridor etc., shall be to the account of the Bidder.

In case of reduction or cancellation of open access schedule, the defaulting party will bear all open access charges thereof in accordance with MERC (Transmission Open Access) Regulations, 2016 / procedure for Scheduling of bilateral transaction by CTU dated 28.01.2008 and subsequent amendments from time to time.

4. Open Access and Scheduling:-

After receipt of Letter of Intent (LoI) for supply of power, the Bidder has to apply for booking of transmission corridor for full contracted quantum for contracted period of supply for which is issued and acknowledge the acceptance of same. Any revision in contracted quantum by the Supplier will not be accepted. There will be no liability on payment for BEST to pay the excess energy supplied by the Supplier on its own accord.

The Bidder shall book for open access on firm basis upto delivery point in accordance with procedure of bilateral transaction based on CERC's Open Access Regulations, 2008/ MERC (Transmission Open Access) Regulations, 2016 with amendments from time to time. Any liability on account of open access or any clarification on open access upto and beyond the delivery point will not come under purview of BEST.

BEST shall have the right to surrender/cancel open access at any time due to any unforeseen circumstances. Bidder shall have to respond immediately on request from

BEST and arrange to surrender/cancel open access.

Both BEST and the Bidder shall schedule this power in full except in case of Force Majeure. The scheduling and dispatch of the power shall be coordinated with respective RLDCs/SLDCs as per the relevant provisions of IEGC/State Grid Code Regulations, 2020, frame work of MERC's Deviation Settlement Mechanism (DSM) and decisions of RLDCs, SLDCs and RPCs.

Final Energy accounting shall be as per the REA/SEA issued by the concerned RLDC/RPC/SLDC.

5. Tariff:-

Bidder shall quote firm price (Rs./kWh) at delivery point for each contracted period mentioned in the bid document and shall be inclusive of capacity charges, variable charges, trading margin, all taxes, duties, levy, cess etc. imposed by Central/State governments / Statutory authorities, etc..

The Tariff shall not change during contractual period if any tax / duty / levy / cess / charges / fees become applicable after the submission of bids.

Bidder shall quote the single tariff at delivery point up to three decimals.

In case Bidder being trader, should ensure that trading margin charged should be as per norm of appropriate regulatory commission.

6. Supply from alternative sources:-

In case of failure of the generation source, Bidder shall have to supply power from alternative source(s) with intimation to BEST. The supply from the alternative source(s), if any, would be made at the same tariff at which supplier has contracted power with BEST. Any additional liability in supply of power from alternative source(s) shall be borne by the Bidder.

7. Billing Cycle:-

Bidder(s) shall raise Provisional weekly energy bills based on daily schedule issued by Maharashtra SLDC / WRLDC. The blockwise energy schedules shall be rounded off to nearest second decimal point. The Final bill to be issued based on the REA published by the WRPC for Inter-state power and SEA based on DSM issued by MSLDC for Intra-state power. After receipt of REA of WRPC/ SEA statement of MSLDC, Final bill shall be raised by the Bidder for necessary adjustments.

8. Payment:-

Energy Bill:

BEST shall make payment to Bidder(s) in Bidder(s) bank account by RTGS within thirty (30) days from the receipt of correct bill, which will be the due date.

BEST will be eligible for prompt payment rebate @ 2% on energy bill amount, if the payment is made within seven (7) days (Excluding Sundays and Bank holidays) from the receipt of correct energy bill, through email/courier.

Compensation Bill:-

For any Compensation payable by BEST/Bidder, invoice shall be raised by Bidder/BEST as the case may be and payment shall be made within 30 days from the date of receipt of correct bill.

In case the due date falls on Sunday/ Bank holiday, then the next working day would be considered as due date. This is applicable to all above referred Bills.

Surcharge on delayed payment (if any) for all above Bills shall be as follows:

1.25% per month on all outstanding payments after the 30^{th} day from the date of receipt of correct bill. The surcharge shall be calculated on a day-to-day basis for each day of the delay after due date.

9. Compensation Clause for failure to Supply/ Off-take the Quoted capacity:-

Both the parties would ensure that actual scheduling does not deviate by more than 15% of the contracted power as per the approved open access on monthly basis or actual period (if period is less than a month) during Contracted period.

Without prejudice to provision of force majeure, if Bidder fails to supply contracted quantum of energy as per approved open access on monthly basis in the Contracted period, Bidder shall pay compensation to BEST @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15 % in the Contracted period.

In case BEST defaults in off take of contracted quantum of energy as per approved open access on monthly basis in the Contracted period, BEST shall pay to Bidder @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15% in the Contracted period.

Allowable reduction in quantum of power, if required, shall be uniformly spread over the month as far as possible.

Compensation on account of shortfall in supply/Off-take will be settled separately on monthly basis and either party shall raise invoice to claim compensation. For any Compensation payable by BEST/Bidder as above, invoice shall be raised by Bidder/BEST as the case may be within 1st week after completion of the month and payment shall be made within 30 days from the date of receipt of invoice.

Bidder must apply for Open access for full contracted capacity. If the Bidder does not apply for open access for full quantity, then this would be treated as default in supply of power by the Bidder and compensation provision will apply.

10. Force Majeure:

A "Force Majeure Event" shall mean any event or circumstance or combination of events or circumstances (not otherwise constituting an Indian political Event)that adversely affects, prevents or delays any party in the performance of its obligation in accordance with the terms of this Agreement, but only if and to the extent that (i) such events and circumstances are not within the reasonable control of the affected party, and (ii) such events or circumstances could not have been prevented through employment of Prudent Utility Practices.

Neither party shall be in breach of its obligations pursuant to this understanding to the extent that the performance of its obligation was prevented, hindered or delayed due to Force Majeure Event, and without in any way prejudicing the obligation of either Party to make payments of amounts accrued due prior to the occurrence of the event of Force Majeure, which shall be payable on the original Due Date.

Force Majeure events shall include but not limited to:

a) Act of war, invasion, armed conflict, blockade, revolution, riot, insurrection or civil commotion, terrorism, sabotage, fire, explosion or criminal damage;

b) Act of God, including fire, lightning, cyclone, typhoon, flood, tidal wave, storm, earthquake, landslide, epidemic, pandemic or similar cataclysmic event;

c) Any curtailment/suspension/non-availability of transmission capacity by intervening SLDCs and/or RLDCs;

d) Any restriction imposed by any RLDCs and including generation constraints/equipment breakdown / Islanding / accidents;

e) Regulatory intervention in the matter of power trading as also orders from CERC/ SERCs/ Appellate Tribunal of Electricity/High Courts/ Supreme Court particularly related to rates at which power can be sold/ purchased/traded. This will also include regulations / orders already issued but yet to be conclusively enforced. Any directive by Government of Maharashtra not to export power outside Maharashtra state boundary.

11. Change in Law:-

Since the tender is invited for short term period at firm price, any variation in price due to any reasons what so ever, including change in Law, will not be applicable.

12. Details of the Bidder(s) (In case of the Bidder being a trading licensee):-

In case the Bidder is trading licensee, Agreement with the seller/generator shall be attached with the Bid.

13 Bid Validity:-

The validity period of offer of Bidder shall be till **31.03.2022.**

14 BEST's Rights:

BEST reserves its right to accept or reject any Offer whether fully or partially without assigning any reasons pursuant to this Bid. The Bidder on the other hand binds himself to sell power in part or whole at the option of the BEST.

15. Resolution of Dispute:-

Any dispute or differences arising under, out of, or in connection with this Bid document shall be subjected to exclusive jurisdiction of competent court at Mumbai only. In any event BEST shall not be responsible for any dispute between the Bidder (in case of bidder being the trading licensee) and the Generator.

16. Arbitration:

Subject to the statutory provisions for arbitration under the Electricity Act, 2003, all other differences or disputes between the parties arising out of or in connection with this Bid document shall be settled through Arbitration subject to the provisions of the Arbitration and Conciliation Act, 1996. The venue for Arbitration shall be at Mumbai.

Notwithstanding any legal dispute, disagreement or difference, the parties here to, continue to perform the respective obligations under the terms of this agreement.

17. Condition Precedent:-

The Letter of Intent (LoI) is subject to approval, clearances and permissions from all authorities i.e. Maharashtra Electricity Regulatory Commission (MERC), RLDC/ SLDCs.

18. Acceptance of Offer:-

BEST reserves the right to reject any or all the Bids without assigning any reasons what so ever. It is also not binding on BEST to disclose any analysis report on offers. Once the acceptance of the offer is conveyed, the Bidder(s) would be bound to supply the power as per the contract. BEST reserves the right to enter into Letter of Intent (LoI) with one or more of the Suppliers.

****

Annexure-II

To be given on the official letter head of the Bidder

Acceptance of Terms and Conditions of Bid Document

(To be signed by the authorized person of the bidder)

We/I have carefully gone through the Bid Document No. ……………..…….. dated………….and satisfied ourselves/myself and hereby confirm that our/my offer strictly conforms to the requirements of the Bid Document and all the terms and conditions are acceptable to us.

Signature :-

Name :-

Status :-

Whether Authorized Yes/No

Power of Attorney of Bidding Company
Authorizing the signatory to sign the bid

Name & Seal of Bidding Company

Format of Covering Letter

(The covering letter should be on letter head of bidding company/ lead member of the bidding consortium)

Date……………………..

From………………………… (Insert Name and address of bidding company)
………………………….
Tel No :-
Fax:-
Email address :

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

Sub: Bid for Purchase of power by BEST on short term Basis i.e. for the period from……….. to……….through e-Tender & e-Reverse Auction process in response to Bid Document No. ……………. dated ………..

Dear Sir,

We, the undersigned, ………..(insert name of the bidder) having read, examined and understood in detail the Bid document for purchase of power by BEST on short term basis i.e. for the period from……….. to……….through E-tendering process hereby submit our bid.

a. We give unconditional acceptance to the Bid Document No…..………………dated ……………(insert date), attached thereto, issued by the BEST.
   In token of our acceptance to the Bid Document, the same have been initiated by us and enclosed to the bid. We shall ensure provisions of the Bid Document shall be binding on us.

b. EMD:
   We have enclosed the EMD of Rs……………….(insert amount), in the form of Bank Guarantee dated …….. drawn on ………………(insert name of Bank) and payable at Mumbai.
   The offered quantum of power by us is …………MW(insert total capacity offered).

c. We have submitted our financial bid strictly as per Bid Document without any deviations, conditions and without mentioning any assumptions or notes for the financial bid in the said format.

d. Acceptance:-
We hereby unconditionally and irrevocably agree and accept that the decision made by the BEST in respect of any matter regarding or arising out of the Bid shall be binding on us. We hereby expressly waive any and all claim in respect of Bid process.

We confirm that there are no litigations or disputes against us, which materially affect our ability to fulfill our obligations with regard to supply of power.

e. Contact person:
Details of contact person are furnished as under:
Name ………………………………
Designation………………………..
Company………………………….
Address…………………………….
Phone Nos …………………………
Fax Nos……………………………..
Email Address……………………….

f. It is confirm that our bid is consistent with all the requirements of submissions as stated in the Bid Document and subsequent communications from BEST.

g. The information submitted in our bid is complete, strictly as per the requirement stipulated in the Bid Document and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our bid.

h. We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of ………days from the bid deadline (i.e. till……..day of………2022).

i. We confirm that we have not taken any deviations so as to be deemed non responsive with respect to the provisions of this Bid Document.

Dated ……..day of………2022

Thanking You.

Your's Faithfully,

(name , designation and signature of authorized person in whose name power of attorney/Board Resolution is issued by the Bidder)

Annexure-III

DRAFT FORMAT OF THE BANK GURANTEE FOR EMD

(The Bank Guarantee should be executed on a non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution along with a Confirmatory Letter from the Regional office of the Bank concerned in enclosed format.)

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

In consideration of ______________ (name of Bidder to be inserted) agreeing to undertake the obligations under the terms and conditions of Bid Document No:_____________ dated______ signed by_________________________(name of bidder to be inserted) having its office at ________________ .The_________________ (Insert Guarantor Bank Name) having its registered office at __________________ hereinafter referred to as "Guarantor Bank" hereby agrees unequivocally, irrevocably and unconditionally to pay to BEST Undertaking having its office at BEST Bhavan, BEST Marg, Mumbai-400001 forthwith on demand in writing from the General Manager, BEST Undertaking or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees___________ Only with respect to the offered Capacity of______MW as per the terms and conditions of the Bid Document No. ________________dated_________.

This guarantee shall be valid and binding on the Guarantor Bank upto and including______________________(Insert date of validity of EMD) and shall in no event not be terminable by notice or any change in the constitution of the Bank or the term of the Bid Document No.______________ dated_______ signed by__________ or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs._______________(Rs._________/-) only. Our Guarantee shall remain in force until _____________. BEST Undertaking shall be entitled to invoke this Guarantee up to _________________, by issuance of a written demand to invoke this guarantee.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand from BEST Undertaking, made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to BEST Undertaking.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by__________ (name of Bidder to be inserted). The Guarantor Bank shall not require BEST Undertaking to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against the Procurer(s) in respect of any payment made hereunder.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring, liquidation, winding up, dissolution or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly BEST Undertaking shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against_________ (name of Bidder to be inserted)to make any claim against or any demand on the ___________ (name of Bidder to be inserted)or to give any notice to or to enforce any security held by BEST Undertaking or to exercise, levy or enforce any distress, diligence or other process against__________(name of Bidder to be inserted).

The Guarantor Bank acknowledges that this BANK GUARANTEE is not personal to BEST Undertaking and may be assigned, in whole or in part, (whether absolutely or by way of security) by BEST Undertaking to any entity to whom it is entitled to assign its rights and obligations under the Bid document.

The Guarantor Bank hereby agrees and acknowledges that BEST Undertaking shall have a right to invoke this Bank Guarantee either in part or in full, as it may deem fit.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs._____________ (Rs ___________/-) only and it shall remain in force until______________.

This BANK GUARANTEE shall be extended from time to time for such period, as may be desired by______________ (name of Bidder to be inserted). We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if BEST Undertaking serves upon us a written claim or demand.

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Mumbai shall have exclusive jurisdiction.

In witness whereof the Bank, through its authorized officer, has set its hand and stamp on his____________ day of_____________ at___________.

Witness :-

(1) ________________________________ The Duly Constituted Attorney

(Signature)

______________________________ ____________________________

(Name of the witness) (Signature)

_______________________________ ____________________________

(Address of the witness) (Name & Designation of the person)

For _____________________________

(Name of the Bank)

(2) ________________________________

(Signature)

________________________________ _______________________________

(Name of the witness) (Name of the Bidder)

____

(Address of the witness)

The Bank and the said Messrs.

Witness: ________________________________

____

(Signature)

____

(Name of the witness)

____

(Address of the witness)

Home|Back

Bid Sheet

Select Typ	Medium Term Bid Sheet
Select Eve	BEST/Short/21-22/RA/117
Event Ref.	BEST/Short/21-22/RA/117
Period :	16/02/2022 12:00:00 To 16/02/2022 14:00:00

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
1	1 (Maharashtra STU Periphery)	100.0(MW)	From 01.04.2022:09.00 to 30.04.2022:17.00	Tata Power Trading Company Limited/74212	100	5.4	16/02/2022 13:48	Jindal power Limited (JPL)
				PTC India Limited/74494	20	6	IPO 11/02/2022 12:07:17	Jaypee Nigrie Super Thermal Power Plant (JNSTPP)located in Madhya Pradesh in Western Region
				PTC India Limited/74493	20	6.1	IPO 11/02/2022 12:14:33	Jaypee Bina Thermal Power Plant (JBTPP)located in Madhya Pradesh in Western Region

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74212	100	5.4	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
2	2 (Maharashtra STU Periphery)	100.0(MW)	From 01.05.2022:09.00 to 31.05.2022:17.00	Tata Power Trading Company Limited/74212	**100**	**5.16**	16/02/2022 13:52	Jindal power Limited (JPL)
				Dhariwal Infrastructure Limited/84368	**60**	**4.95**	IPO 10/02/2022 19:47:01	DHARIWAL INFRASTRUCTURE LIMITED, UNIT I OF 300 MW CONNECTED TO MSETCL
				PTC India Limited/74494	**20**	**6**	IPO 11/02/2022 12:07:17	Jaypee Nigrie Super Thermal Power Plant (JNSTPP)located in Madhya Pradesh in Western Region
				PTC India Limited/74493	**20**	**6.1**	IPO 11/02/2022 12:14:33	Jaypee Bina Thermal Power Plant (JBTPP)located in Madhya Pradesh in Western Region
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Dhariwal Infrastructure Limited/84368	60	4.95	IPO				
2	Tata Power Trading Company Limited/74212	40	5.16	RA				

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
3	3 (Maharashtra STU Periphery)	100.0(MW)	From 01.06.2022:09.00 to 30.06.2022:17.00	Tata Power Trading Company Limited/74212	**100**	**5.16**	16/02/2022 13:52	Jindal power Limited (JPL)
				Dhariwal Infrastructure Limited/84368	**60**	**4.75**	IPO 10/02/2022 19:47:01	DHARIWAL INFRASTRUCTURE LIMITED, UNIT I OF 300 MW CONNECTED TO MSETCL
				PTC India Limited/74494	**20**	**6**	IPO 11/02/2022 12:07:17	Jaypee Nigrie Super Thermal Power Plant (JNSTPP)located in Madhya Pradesh in Western Region
				PTC India Limited/74493	**20**	**6.1**	IPO 11/02/2022 12:14:33	Jaypee Bina Thermal Power Plant (JBTPP)located in Madhya Pradesh in Western Region

Bucket Filling				
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Dhariwal Infrastructure Limited/84368	60	4.75	IPO
2	Tata Power Trading Company Limited/74212	40	5.16	RA

Reverse Auction Participated Bidders Details				
Sl.No.	**Bidder Ref. No.**	**Company Name**	**Contact Person**	**Email**
1	Tata Power Trading Company Limited/74212	Tata Power Trading Company Limited	ANUJESH SHAHI	tptclmarketing@tatapower.com

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
World Trade Centre, Centre No.1, 13th Floor, Cuffe Parade, Mumbai 400005.
Tel. 022 22163964/65/69 Fax 22163976
Email: mercindia@merc.gov.in
Website: www.merc.gov.in

Case No. 46 of 2022

Case of Brihanmumbai Electric Supply and Transport Undertaking for the approval of tariff discovered through competitive bidding process for short term bilateral power purchase for the period from April 2022 to June 2022

Coram
Sanjay Kumar, Chairperson
Mukesh Khullar, Member

Brihanmumbai Electric Supply and Transport Undertaking: - Petitioner

Appearance
For Petitioner: - Shri. N.N Chougule (Rep)

ORDER

Date: 6 April, 2022

1. Brihanmumbai Electric Supply and Transport Undertaking (**BEST**) has filed this Case on 11 March, 2022 under Sections 63 of the Electricity Act, 2003 (**EA, 2003**) read with Regulations 22 of MYT Tariff Regulations, 2019 for the approval of tariff discovered through competitive bidding process for short term bilateral power purchase for the period from April 2022 to June 2022.

2. **BEST's main prayers are as under:**

   a. *Hon'ble Commission may accord approval for tariff discovered through competitive bidding process undertaken by BEST for short term bilateral power purchase for the period April'2022 to June'2022;*

   b. *Hon'ble Commission may accord approval for power procurement from short term sources at the rate of Rs 5/kWh for FY 2022-23;*

3. **BEST in its Petition has stated as follows:**

3.1 The Commission, vide its MYT Order in Case No. 324 of 2019 dated 30 March, 2020 has approved power procurement and cost of such procurement for FY2022-23 from various sources, including Renewable power for BEST. Details of the same are as below:

Particulars	**MYT Petition**			**Approved in this Order**		
	Quantum (MU)	**Total Cost (Rs.Cr.)**	**Avg. Rate (Rs./kWh)**	**Quantum (MU)**	**Total Cost (Rs.Cr.)**	**Avg. Rate (Rs./kWh)**
TPC-G	3,567.89	1,566.55	4.39	3,510.94	1,660.96	4.73
Walwahan solar Energy Maharashtra (Erstwhile Welsun)	31.50	26.96	8.56	31.50	26.96	8.56
Manikaran Power Limited (Medium term)	744.60	332.03	4.46	744.60	332.03	4.46
Solar Energy	312.61	102.85	3.29	307.74	89.25	2.90
Non-Solar Energy				500.37	143.61	2.87
Bilateral Power Purchase	498.35	199.34	4.00	0.00	0.00	4.00
REC Non-solar	507.38	171.68	3.38	-	-	-
Standby charges	-	102.64	-	-	98.53	-
Transmission Charges	-	280.85	-	-	256.72	-
MSLDC Charges	-	1.45	-	-	1.27	-
Total Power Purchase	**5,154.96**	**2,784.35**	**5.40**	**5,095.15**	**2,609.33**	**5.12**

3.2 The Commission has considered the entire purchase towards Renewable Purchase Obligations (RPO) for FY 2022-23 through existing contracted Renewable Energy (RE) (solar) source and purchase of RE power from competitive bidding route and has approved ‘zero’ quantum for power purchase from short term sources in FY 2022-23.

3.3 The Commission vide its Order dated 26 April, 2021 in Case No. 16 of 2021 has accorded its approval to procurement of 400 MW wind-solar hybrid power by BEST from Solar Energy Corporation Limited (SECI) at tariff of Rs. 2.48/kWh discovered through competitive bidding for 25 years. The actual power flow from these projects is anticipated to commence from February 2023. Thus, quantum of RE power through competitive bidding route, as approved by the Commission in MYT Order of BEST, will not be available for considerable period in FY 2022-23. It will be therefore necessary to purchase energy required to meet any shortfall against planned/breakdown outages of contracted sources or in the event of increase in demand over anticipated projection.

3.4 BEST has made discreet enquiries with RE generators/traders for the participation in competitive bidding for short-term RE power purchase to be undertaken by BEST; however, no favourable response was received from the generators/traders as most of them are having tie-up with other utilities Also, the average Daily cleared volume under trading of RE (Solar & Non-solar) power under Green Term Ahead Market (GTAM) (mostly on day-ahead contingency basis) and Green Day Ahead Market (GDAM) on Power exchange is around 12 MU, which is quite low vis-vis daily average volume of around 230 MU under DAM/RTAM segment. Further, sell quantum of RE power on

GTAM/GDAM is quite lower than buy bids; therefore, market always tilts in seller's favour. However, BEST has made efforts to procure RE power in FY 2021-22 through bidding on Green market on power exchange in addition to procurement of certain quantum of Renewable Energy Certificates (REC)s to meet its RPO target.

3.5 BEST's overall demand and subsequent revenue recovery has been affected due to Covid pandemic, the availability of working capital (cash flow) on day-to-day basis has also been impacted. On account of all these issues, it has become difficult to purchase high-cost RECs to meet specified RPO target. As power from SECI's 400 MW Hybrid RE project is anticipated to flow from February 2023 onwards and in order to reduce tariff cost of BEST's electricity consumers, BEST requests the Commission to waive off RPO for FY 2021-22 and FY 2022-23

3.6 BEST has allocation of 90 MW from TPC's Unit-7 (180 MW) gas based generating unit. In recent years, due to change in priority for the power sector, the allocation of Administered Price Mechanism (APM) gas to TPC's Trombay units from Gas Authority of India Limited (GAIL) has considerably reduced. This has resulted into lower generation from TPC's Unit-7 as seen from Plant Load Factor (PLF) of the plant in current fiscal year as tabulated below:

Month	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sept-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22
PLF	76%	57%	84%	58%	9%*	64%	79%$	71%	68%	19%	65%

**Unit was under planned outage, $ Mostly operated on APM gas+ RLNG*

This generating unit during its service is operated on APM gas at average level of 110 MW. It is anticipated that the trend of lower generation from this generating unit may be likely to prevail in ensuing period due to lower APM gas availability and therefore, anticipated shortfall from this source to BEST will be around up to 40 MW.

3.7 Since March 2020, BEST's demand has drastically reduced due to outbreak of Covid-19 pandemic. However, after lifting of restrictions placed in Mumbai under Government of Maharashtra's Covid-19 guidelines, the economic activities are anticipated to get momentum pushing up the electricity demand. Considering this factor and the period of April to June2022 being summer season, BEST's demand will likely rise as was experienced during the month of October 2021.The recorded peak demand of BEST in current fiscal year is 803 MW (October 2021).The anticipated demand of BEST during day peak time in ensuing summer season will be around 850 MW.

3.8 Considering anticipated rise in demand in summer season vis-a-vis anticipated lower generation from contracted TPC Unit-7, there will be shortfall in the availability against BEST's anticipated demand during daytime in summer period; therefore, power on short-term basis needs to be procured.

3.9 Considering volatility in the short-term market, particularly during high demand summer season and as experienced during recent month of September/ October 2021, it is necessary to tie-up power with bilateral contracts to ensure reliability to meet the anticipated demand in summer season. BEST has invited e-tender (BEST/Short/21-22/ET/125 & BEST/Short/21-22/RA/117 dated 7 February, 2022) for bilateral power purchase of 100 MW each for time slot of 09:00 to 17:00 hrs for the period April 2022 to June 2022 on DEEP portal on 7 February, 2022.

3.10 This e-tender is in line with Ministry of Power's guidelines dated 30 March, 2016 for short-term procurement of power by Discoms through tariff-based bidding. The outcome of the bidding process is summarized below:

Period	Time slot	Bid quantum in MW	Successful bidders(source)	Allotted quantum in MW	Rate in Rs./kWh
1st to 30th April' 2022	09:00 to 17:00 Hrs.	100	Tata Power Trading Company Ltd. (Jindal Power,CG)	100	5.40
1st to 31st May' 2022		100	Dhariwal Infrastructure Ltd. (DIL, Chandrapur)	60	4.95
			Tata Power Trading Company Ltd. (Jindal Power,CG)	40	5.16
1st to 30th June' 2022		100	Dhariwal Infrastructure Ltd. (DIL, Chandrapur)	60	4.75
			Tata Power Trading Company Ltd. (Jindal Power,CG)	40	5.16

3.11 After considering the discovered rate and allocated quantity to successful bidders, the estimated average rate of power purchase cost for total 73 MU for three-month period will be Rs.5.12/kWh. The discovered tariff is nearly in line with results of bids floated on DEEP portal by other utilities for aforesaid period.

3.12 Further, in the meeting with State Discoms/Gencos in the month of February2022, Maharashtra State Load Despatch Centre (MSLDC) / Western Regional Load Despatch Centre (WRLDC) has communicated that Ministry of Power has given certain directives to Load Dispatch Centres to ensure proper Load-Generation balance in view of India's peak power demand crossing 200 GW. MSLDC has given directives that in view of rise in State level demand in February 2022 and anticipated rise in demand during ensuing summer season; particularly national level high demand month of April, all State Discoms should ensure adequate resource planning to meet its demand.

3.13 Considering all the above aspects, BEST intends to procure total allocated bid quantum at discovered tariff through competitive bidding for the period April 2022 to June 2022 to ensure reliability of power supply during summer season. Accordingly, Letter of Intent (LoI) / Power Purchase Agreement (PPA) is issued to the successful bidders on 3 March, 2022.

3.14 Due to substantial increase in price of imported coal coupled with foreign currency fluctuations, actual cost of coal based thermal generation from its contracted TPC's Unit-5 and Unit-8 has sharply increased. The Variable charge of these generating units, which was at Rs.3.31/kWh in January 2021 has now sharply shot up to Rs. 7.35/kWh in February 2022. TPC has earlier indicated that though prices of imported coal have dropped from peak level in November 2021, the coal prices are anticipated to remain on higher side in ensuing period. Further, prevailing geopolitical crises will have impact on prices of imported coal and natural gas in ensuing period.

3.15 Under Intra-state Deviation Settlement Mechanism (DSM) framework, utility-wise decentralized scheduling of power is implemented. In order to optimize the power purchase cost by Discom, alternate cheaper power can be arranged in lieu of scheduling costly power from contracted generating units above its technical minimum level; BEST is currently adopting this approach for scheduling its power and shall continue this approach in ensuing period in order to optimize its power purchase cost.

3.16 The Commission, vide BEST MYT Order dated 30 March, 2020 in Case No. 324 of 2019, has approved tariff of Rs. 4.00/kWh for the power purchase from Bilateral source in FY 2020-21 and FY 2021-22. The approved tariff was in line with the then prevailing trend of short term power prices during FY 2019-20. Since then Inter-State short term open access charges has substantially increased. Further, during FY 2019-20 and FY 2021-22 (upto August2021), power market was subdued due to low demand at national level. Thereafter, on sharp rise in overall demand in the country on opening of economic activities and demand-supply imbalance arising out shortage of domestic coal for power generation coupled with high prices of imported coal, energy price on short term market have faced volatility. Considering pricing trend on Power exchange in recent months, results of competitive bids floated on DEEP portal by various utilities for short term power purchase for ensuing period in FY 2022-23 as well as likely impact of inflationary pressure on energy prices arising out of global crisis in ensuing period, the average tariff of power purchase from short term sources is likely to be around Rs. 5.00/kWh.

3.17 Further MoP Guidelines dated 30 March, 2016 mandates the Licensee to file the Petition before the Commission, if the quantum of power procured and tariff determined are not within the blanket approval granted by the Appropriate Commission in Annual Revenue Requirement (ARR) of the respective year.

3.18 In view of above, it is requested to approve short term power purchase.

4. **At the time of E-hearing held on 25 March, 2022**:

BEST reiterated the submission made in the Petition and requested the Commission to approve the short-term power purchase of 100 MW per month for the period from April 2022 to June 2022 considering the anticipated shortfall, at the tariff of Rs 5/kWh discovered through competitive bidding route.

Commission's Analysis and Ruling:

5. Present petition has been filed by the BEST seeking approval for short-term power procurement of 100 MW during the period of 9.00 to 17.00 hrs in the month of April 2022 to June 2022 on account of anticipated shortfall and further seeking adoption of the tariff discovered through competitive bidding.

6. BEST in its Petition has summarised the reasons for such short-term power procurement. BEST while supporting the procurement stated that the Commission in the MYT Tariff Order has considered RE power through competitive bidding for FY 2022-23 and has not considered any short-term power for FY 2022-23. However, as per actual schedule of tied up sources, the RE power will not be available in FY 2022-23. Further, BEST is anticipating reduction in supply for FY 2022-23 from gas based TPC Unit 7 on account of availability of gas in the market and pricing for the same. Further increase in cost of imported coal has led to increase in variable cost of contracted sources. All these have necessitated BEST to optimise its power procurement cost. Also, BEST has anticipated that its demand will reach 850 MW in the summer season as was experienced in October 2021 from the existing level of 803 MW. Therefore, considering the volatility in the market and to meet the anticipated demand, BEST has initiated the short-term power procurement. BEST has carried out the bidding on DEEP portal and requested the Commission to approve the same as per the provisions of MYT Regulations, 2019 and as per the MoP guidelines. Further, as power from contracted RE sources will not be available for most of FY 2022-23, BEST has also requested Commission to waive off RPO for FY 2021-22 and FY 2022-23.

7. Considering the submissions made in the matter, the Commission frames following issues to be addressed in the Petition:

   a. Whether approval of the Commission for the procurement of short-term power is required?

   b. Whether the additional short term power purchase by BEST is justified?

   c. Whether the discovered tariff is consistent with the market trend?

   d. Whether exemption from RPO as sought by BEST be granted?

   The Commission is addressing these issues in following paragraphs.

8. **Issue A: - Whether approval of the Commission for the procurement of short-term power is required?**

8.1 The Commission notes the provisions under MYT Regulations, 2019 for the additional power procurement are as follows:

> *"22.1 The Distribution Licensee may undertake additional power procurement during the year, over and above the power procurement plan for the Control Period approved by the Commission, in accordance with this Regulation.*
>
> *22.2 Where there has been an unanticipated increase in the demand for electricity or a shortfall or failure in the supply of electricity from any approved source of supply during the Year or when the sourcing of power from existing tied-up sources becomes costlier than other available alternative sources, the Distribution Licensee may enter into additional agreement or arrangement for procurement of power.*
>
> *22.3 Any variation, during the first or second block of six months of a Year, in the quantum or cost of power procured, including from a source other than a previously approved source, that is expected to be in excess of five per cent of that approved by the Commission, shall require its prior approval:*
>
> *Provided that the five per cent limit shall not apply to variation in the cost of power procured on account of changes in the price of fuel for own generation or the fixed or variable cost of power purchase that is allowed to be recovered in accordance with Regulation 10."*

Thus, in cases where there is an anticipated shortfall in fulfilling the demand and to optimise the power purchase cost, licensee can procure additional power subject to the variation of excess of five percent in the quantum or cost of power procured during the first or second block of six months of a Year from the sources other than approved by the Commission.

8.2 Further Ministry of Power's Guidelines dated 30 March 2016 notified under Section 63 of the Electricity Act 2003 for short-term procurement of power by Distribution Licensees through tariff-based bidding process stipulate as follows:

> *"11.4 If the quantum of power procured and tariff determined are within the blanket approval granted by the Appropriate Commission in Annual Revenue Requirement (ARR) of the respective year, then the same will be considered to have been adopted by the Appropriate Commission.*
>
> *In all other cases, the Procurer(s) shall submit a petition to the Appropriate Commission for adoption of tariff within 2 days from the date of signing of PPA. Appropriate Commission should communicate the decision within 7 days from the date of submission of petition."*

Thus if the quantum of power procured and the tariff determined are not within the blanket approval specified by the Commission in ARR/ Tariff Order, it necessitates the Commission to approve the additional power procurement and to adopt the tariff discovered through competitive bidding process.

8.3 The Commission notes that, it has not approved any short-term procurement for FY 2022-23 in the tariff Order and as per the submissions of BEST; the approved RE power would not be available in FY 2022-23. As the source of power is different than approved by the Commission in MYT Tariff Order, it fulfils the criteria specified in MYT Regulations, 2019 and in the MoP Guidelines dated 30 March, 2016. Hence it is ruled that the approval of the Commission for additional procurement of power is required.

9. **Issue B: - Whether the additional short term power purchase by BEST is justified?**

9.1 The Commission notes the submission of BEST stating that as per the approved sources in the MYT Tariff Order it has entered into the agreement with SECI for the procurement of 400 MW wind-solar hybrid power at tariff of Rs. 2.48/kWh. Same has been approved by the Commission in its Order in Case No 16 of 2021 dated 26 April 2021. Due to time period required for commissioning of the project, power from such source will not available during FY 2022-23. BEST has also enquired with the RE generators / traders for the supply of short-term power through competitive bidding, but no favourable response has been received. Further, considering the possibility of reduction in power supply from TPC Unit -7 due to low availability of APM Gas and increased consumer demand witnessed after opening up of Covid -19 restrictions, the BEST has decided to procure short term power of 100 MW for the period of 9.00 to 17.00 hrs for the month of April to June 2022.

9.2 In view of the above justification submitted by BEST, the Commission is inclined to approve an additional short-term power procurement to meet anticipated shortfall in approved sources and anticipated increase in consumer demand.

9.3 Having ruled as above, the Commission would like to note that MYT Order was issued on 30 March, 2020 and the Commission has considered RE power as per RPO targets in ARR from FY 2022-23 onwards. Thus, BEST had 24 months for contracting such RE power. But BEST has delayed the process and 400 MW wind-hybrid PSA is approved on 26 April, 2021 which has led to unavailability of RE power in most of FY 2022-23 as against projected in MYT Order. Had BEST expedited the process, such situation would not have arisen. Further, it is also important to note that BEST's short-term power requirement is for the period of 9.00 to 17.00 hrs which is coinciding with solar energy generation window. As solar power is now available at much cheaper tariff than conventional sources, BEST should have taken efforts to contract such cheap power. Considering all these aspects, the Commission directs BEST Undertaking to review its power procurement planning in holistic manner so as to source cheapest available power to meet load requirement of its consumers. Such holistic study should be completed within 3 months clearly stipulating action to be taken in timebound manner. Copy of such Report shall be submitted to the Commission within 3 months from date of this Order.

10. **Issue C: - Whether the discovered tariff is consistent with the market trend?**

10.1 The Commission notes that BEST has undertaken the short term power procurement as per the competitive guidelines of MoP dated 30 March, 2016 by floating the bid on DEEP portal on 7 February, 2022 for supply of 100 MW for the period from April 2022 to June 2022 from 9:00 AM to 17:00 AM . The Tariff discovered after E-RA is as follows:

Period	Time slot	Bid quantum in MW	Successful bidders(source)	Allotted quantum in MW	Tariff in Rs./kWh
1st to 30th April 2022	09:00 to 17:00 Hrs.	100	Tata Power Trading Company Ltd. (Jindal Power,CG)	100	5.40
1st to 31st May 2022		100	Dhariwal Infrastructure Ltd. (DIL, Chandrapur)	60	4.95
			Tata Power Trading Company Ltd. (Jindal Power,CG)	40	5.16
1st to 30th June 2022		100	Dhariwal Infrastructure Ltd. (DIL, Chandrapur)	60	4.75
			Tata Power Trading Company Ltd. (Jindal Power,CG)	40	5.16

The weighted average power purchase tariff is coming as Rs 5.12 /kWh.

10.2 In order to assess the competitiveness of the tariff discovered by BEST in the present bidding the Commission referred to recent discovered tariff on DEEP Portal by other Distribution Licensees in Maharashtra and same is tabulated below:

Sr No	Particulars	Period	Availability	Quantum of Power in MW	Discovered tariff in Rs/ kWh
1	TPC-D	1.4.2022 to 30.04.2022	6:00 to 18:00	75	4.96
		1.04.2022 to 30.04.2022	18:00 to 24:00	25	10
		1.05.2022 to 31.05.2022	6:00 to 18:00	75	4.96
		1.05.2022 to 31.05.2022	18:00 to 24:00	25	10
		1.06.2022 to 15.06.2022	6:00 to 18:00	75	4.96
		1.06.2022 to 15.06.2022	18:00 to 24:00	25	10
		15.06.2022 to 30.06.2022	6:00 to 18:00	50	4.96
2	MSEDCL	1.3.2022 to 31.03.2022	0:00 to 24:00	250	6.99
		1.4.2022 to 30.04.2022	0:00 to 24:00	250	6.99
		1.5.2022 to 31.05.2022	0:00 to 24:00	370	6.99
3	AEML-D	1.1.2022 to 31.1.2022	7:00 to 22:00	50	5
				50	5
				50	6.38
		1.2.2022 to 28.2.2022	17:00 to 24:00	50	8.68
		1.3.2022 to 31.3.2022	18:00 to 24:00	50	8.68
		1.3.2022 to 31.3.2022	7:00 to 24:00	50	5
				50	5

From the above it is observed that the discovered tariff is consistent with the current market trend.

10.3 The Commission notes that BEST has carried out the process of procurement of Short-Term Power in accordance with Competitive Bidding Guidelines and tariff discovered is reflective of current market situations.

10.4 Section 63 of the EA, 2003 mandates the Commission to adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.

10.5 In view of the foregoing, the Commission notes that tariff discovered by BEST fulfils mandates and requirements for adoption as set out in Section 63 of the EA, 2003 and MYT Regulations, 2019. Accordingly, the Commission adopts Power Procurement with weighted average tariff of Rs 5.12 /kWh and quantum for BEST undertaking for the period from April, 2022 to June, 2022 as follows:

Period	**Time slot**	**Bid quantum in MW**	**Successful bidders(source)**	**Allotted quantum in MW**	**Tariff in Rs./kWh**
1^{st} to 30^{th}April 2022	09:00 to 17:00 Hrs.	100	Tata Power Trading Company Ltd. (Jindal Power,CG)	100	5.40
1^{st} to 31^{st}May 2022		100	Dhariwal Infrastructure Ltd. (DIL, Chandrapur)	60	4.95
			Tata Power Trading Company Ltd. (Jindal Power,CG)	40	5.16
1^{st} to 30^{th}June 2022		100	Dhariwal Infrastructure Ltd. (DIL, Chandrapur)	60	4.75
			Tata Power Trading Company Ltd. (Jindal Power,CG)	40	5.16
Weighted average cost					5.12

10.6 The Commission also notes that PPAs initialed with the successful bidders are in line with the Standard Bidding documents issued by MoP. Based on these submissions, the Commission approves PPAs signed with above successful bidders at the tariff and for the quantum mentioned in above table in Para 10.5. BEST shall submit copies of final PPAs for records of the Commission.

10.7 Having approved short-term power procurement as above, it is important to note that such short-term power procurement at average tariff of Rs. 5.12/kWh is against RE power approved in the Tariff Order at the tariff of Rs. 2.87 – 2.90/kWh and hence there would be increase in power purchase expenses which will have to be passed on to consumers as per Fuel Adjustment Charge mechanism stipulated in MYT Regulations and subsequent guidelines issued by the Commission in that respect.

10.8 Further, above average tariff of Rs. 5.12/kWh discovered through competitive bidding shall act as ceiling tariff for procurement of short-term power through competitive bidding process for FY 2022-23. Any tariff discovered below such ceiling shall be considered as deemed adopted as per provisions of competitive bidding guidelines notified by the Central Government for short-term power procurement.

11. **Issue d: Whether exemption from RPO as sought by BEST can be granted?**

11.1 BEST in its Petition has stated that it has made efforts to procure RE power in FY 2021-22 through bidding on Green market on power exchange in addition to procurement of certain quantum of RECs to meet its RPO target. Further COVID 19 situations have impacted the availability of working capital (cash flow) on day-to-day basis and it has become difficult to purchase RECs at high rates to meet specified RPO target. As power from SECI's 400 MW Hybrid RE project is anticipated to flow from February 2023 onwards and in order to reduce tariff cost of BEST's electricity consumers, BEST has requested the Commission to waive off RPO for FY 2021-22 and FY 2022-23.

11.2 In this regard, the Commission notes that as per RPO verification proceedings undertaken by the Commission, BEST has fulfilled its cumulative RPO targets till FY 2019-20. Thus, it is observed that BEST has good record of complying with RPO targets in past period. In present petition, BEST has requested for waiving off of RPO target for FY 2021-22 and FY 2022-23. The Commission has never waived off RPO targets but has allowed concerned obligated entity to fulfill the same on cumulative basis at future date. But such decision is also to be taken during the proceedings of RPO compliance and cannot be part of the present proceedings. The Commission is aware that RPO Regulations 2019 have stipulated penalty for not complying with the RPO targets. But the same can be reconsidered if Obligated Entity through its efforts and track record is able to justify with reasons their request for non-levy of such penalty.

11.3 As highlighted in the earlier paragraph, BEST's load curve is suitable for absorbing Solar power which can be used to meet RPO shortfall on cumulative basis. Therefore, BEST should try to meet its RPO target on cumulative basis and shall file petition to the Commission for waiver of penalty in appropriate proceedings.

12. Hence, following Order:

ORDER

1. **Case No. 46 of 2022 is partly allowed.**
2. **Under Section 63 of the Electricity Act, 2003, the Commission adopts Short Term Power Procurement for the period from April 2022 to June 2022 by as Brihanmumbai Electric Supply and Transport Undertaking as stated in para 10.5 above.**
3. **Brihanmumbai Electric Supply and Transport Undertaking, to submit copies of Final PPAs to the Commission for records.**

Sd/-	**Sd/-**
(Mukesh Khullar)	**(Sanjay Kumar)**
Member	**Chairperson**

(Abhijit Deshpande)
Secretary

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Free Press Journal
27/6/2022

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(47)

DEPM
Inward No. 111
Dt: 27/6/2022

The Brihanmumbai Electric Supply & Transport Undertaking
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

BEST

Notice Inviting e-Tender

Brihanmumbai Electric Supply & Transport Undertaking (BEST) invites bids for purchase of power on short term basis for the month from August, 2022 to December, 2022 through National e-bidding process.

The bid document for participation can be downloaded through DEEP e-portal of **www.mstcecommerce.com** from **10:00 hrs of 27.06.2022.** Bids must be submitted online through this portal on or before **17:00 hrs of 01.07.2022.** Any corrigendum will be published on the referred website only.

PRO/DEPM/47/2022

General Manager
BEST Undertaking

Business Standard
27/6/2022

The Brihanmumbai Electric Supply & Transport Undertaking
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

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PRO/DEPM/47/2022

General Manager
BEST Undertaking

B. Std

THE BRIHANMUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING
(OF THE BRIHANMUMBAI MAHANAGAR PALIKA)

Tender No: BEST/Short/22-23/ET/97 & BEST/Short/22-23/RA/97

Bid Document

For

Purchase of Power

Through

E-Tendering and E-Reverse Auction Basis

By

Brihanmumbai Electric Supply & Transport Undertaking

Date: 27.06.2022

INVITATION FOR e-TENDER

Sr. No.	Event	Date/Time
1.	Publication of Bid Document/ Activation of Event	**27.06.2022 at 10:00 hrs.**
2.	Last date of submission of Bids including EMD	**01.07.2022 at 17:00 hrs.**
3.	Opening of Non-financial Technical Bids	**05.07.2022 at 10:00 hrs**
4.	Opening of IPOs	**08.07.2022 at 10:00 hrs**
5.	Start of e-Reverse Auction	**08.07.2022 at 12:00 hrs**

Bids to be submitted through	**DEEP e-bidding portal at www.mstcecommerce.com**
Office inviting Bids and place of submission of EMD	**Divisional Engineer, Power Management Department, BEST Undertaking, 1st Floor, Multi-storied Building Annex. BEST Marg, Colaba, Mumbai-400001 Tel:- 022-22799555 e-mail:- depower@bestundertaking.com**

1. INTRODUCTION AND BACKGROUND:-

Brihanmumbai Electric Supply & Transport Undertaking, here in after referred to as the **"BEST"**, a Distribution Licensee supplying electricity in the Mumbai City is inviting bids for procurement of power under Short Term arrangement for the month of August, 2022 to 15th December, 2022 to meet its demand as per Terms and Conditions of this Bid Document (**Annexure-I**).

Bids are invited from various Trading licensees / Generators / State Utilities / CPPs / Distribution licensees / SEBs for purchase of power. The power would be procured in line with" Guide lines for short-term (i.e. for a period of more than one day to one year) Procurement of Power by Distribution Licensees through Tariff based bidding process" issued by Government of India - Ministry of Power under Section 63 of the Electricity Act, 2003 and as amended from time to time. The responsibility of the Successful Bidder(s) would be to supply power to BEST as per the Terms and Conditions of the Bid Document.

All the interested Bidders shall participate in the bidding process by downloading Bid Document from DEEP e-bidding Portal. The link of e-bidding Portal is **www.mstcecommerce.com**. Bidder needs to register on the e-bidding portal on MSTC website.

2. E-bidding FEE:-

All the Bidders would be able to participate in the e-bidding events on making payment of the requisite fees of Rs.500 per MW per requisition for the total capacity sought for that particular requisition for which a Bidder is willing to bid to PFC Consulting Limited (PFCCL). The requisite fee plus applicable taxes shall be deposited through the portal by e-Payment Gateway provided by MSTC Ltd. After the completion of the bidding process, only successful Bidder(s) will have to pay these charges for the quantum allocated to each Bidder. The balance amount will be refunded by PFCCL within seven (7) working days without any interest. The fee deposited by non-selected Bidder(s) will also be refunded by PFCCL within seven (7) working days of completion of the event without any interest.

3. Quantum of Power:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement for the month of August, 2022 to 15th December, 2022 from various sources. The Bidder(s) shall supply power as mentioned below to BEST:

Requisition No.	Contract Period		Slot/ Time (Hrs.)			Quantum (in MW)	Minimum Bid Quantity (in MW)	Delivery Point
	From	To	From		To			
1.	01-Aug-22	31-Aug-22	10:00	To	18:00	50	20	Maharashtra STU Periphery
2.	01-Sept-22	30-Sept-22	10:00	To	18:00	50	20	Maharashtra STU Periphery
3.	01-Oct-22	31-Oct-22	00:00	To	24:00	50	20	Maharashtra STU Periphery
4.	01-Oct-22	31-Oct-22	10:00	To	19:00	100	20	Maharashtra STU Periphery
5.	01-Nov-22	30-Nov-22	10:00	To	19:00	80	20	Maharashtra STU Periphery
6.	01-Dec-22	15-Dec-22	10:00	To	19:00	100	20	Maharashtra STU Periphery

The Bidder(s) should be capable to supply power to BEST during the contracted period at the delivery point, for which the responsibility will be of the Bidder(s). Bidder/s shall ensure necessary infrastructure/ground work in this regard, while participating in the Bid.

4. Qualification Criteria:-

a. All the Generators/State Utilities /CPPs /Distribution Licensees /SEBs and trading licensees having valid trading license from Appropriate Commission are qualified to participate in the bidding process.

b. The Bidder must quote not less than Minimum Bid Quantity, as mentioned in the table above, from single source of generation.

c. If Bidder being an electricity trading licensee, then the trader(s) should submit a valid license from CERC/SERC for Inter-state /Intra-state trading of electricity. The trader shall also attach a photocopy of the same along with the Bid.

5. Submission of Bid:-

The Bidders shall submit their Bids on-line, through DEEP e-bidding portal only.

A) Non-Financial Bid Comprising of:

a) Acceptance to Terms and Conditions of Bid document (**Annexure-II**).

b) Bid Security (EMD) in the form of Bank Guarantee issued by any Nationalized/Scheduled Bank.

c) Source from which Bidder shall supply power shall be mentioned.

d) In case Bidder is Trader, scanned copy of valid Trading license from appropriate Commission should also be provided.

e) Copy of the authorization received from the Generator (in case of trader).

f) Board resolution/Authorization for signing the Bid document.

B) Financial Bid:-

Bidders shall be required to submit separate Non-Financial Technical Bids and Financial Bids i.e. Initial Price Offer (IPO) as per the following time-table:-

Event	**Date and time**
Date of publication of Bid document / Activation of Event	**27.06.2022 at 10:00 hrs.**
Submission of Bid (online Digitally signed Non-Financial Technical bid & IPOs)	**01.07.2022 at 17:00 hrs.**
Opening of Non-Financial Technical Bids	**05.07.2022 at 10:00 hrs**
Clarification, if any, sought from bidders	**06.07.2022 at 17:00 hrs**
Opening of IPOs	**08.07.2022 at 10:00 hrs**
Start of e-Reverse Auction	**08.07.2022 at 12:00 hrs**
Submission of Application for Open Access	**As per Open Access procedure/regulations**
Approval and Obtaining SLDC consent by the seller/purchaser.	

Note: BEST may extend the timelines of Bid with intimation to all Bidders through DEEP e-bidding portal only.

The Bidders are required to upload scanned copy of the EMD along with the Bid and the original copy of EMD to be sent so as to reach the address as given below on or before **17:00 hrs of 01.07.2022**:

Divisional Engineer,
Power Management Department,
BEST Undertaking,
1st Floor, Multi-storied Building Annex.
BEST Marg, Colaba,
Mumbai-400001.
Tel:- 022-22799555

6. BIDDING PROCESS:-

a. The Bidder shall use one Digital Signature to submit bid through one login and for each e-bidding event shall comprise of two parts i.e. e-Tender and e-Reverse Auction. An event may have multiple requisitions (i.e. independent requirements of power at different time or places). To participate in the event, each Bidder will have to specify the source of power for that particular bid. Each bid will have only one price per requisition accompanied by the total quantum of power the Bidder intends to supply and minimum threshold quantum acceptable to the Bidder. However, the Bidder shall have the option to choose the requisition of an event in which it intends to participate. Each of the Bids will have to be signed by the Digital signature of the Bidder.

b. Each login the bidder may submit only one price bid from one source. However, against each requisition the Bidder have the option to bid multiple bids from separate login either from same or different sources.

c. The Bidder shall quote the single tariff at delivery point up to three (3) decimals which shall include capacity charge, energy charge, trading margin (in case of Bidder being a Trader) and all taxes, duties, cess, levies etc. Open Access charges up to and beyond the delivery point shall be borne by the Bidder. The price quoted shall not change in case if any tax/ duty/ levy/cess/charges become applicable after the submission of Bids. The tariff should be constant and there shall be no escalation during the contractual period.

d. Each event of the auction would require independent Digital Signature of the Bidder.

e. Bidders shall be required to submit separate Non-Financial Technical Bid and Financial Bids i.e. Initial Price Offer (IPO) through e-bidding portal.

f. The Bidders can revise their IPOs before date and time of submission of Bid Document.

g. After acceptance of the Non-Financial Technical Bids, the Financial Bids shall be opened as per schedule given in event time table.

h. In the event, if two or more Bidders quote the same amount of Tariff during IPO and e-Reverse Auction stage, the time of submission of Bid will be the deciding factor for their ranking.

i. The elimination of the Bidders shall be done by the following method:

1) After the opening of Initial Price Offers, the system will rank the Bidders according to their price bids. The Bidder with the highest price bid in IPO stage will be

called the H1 Bidder. The system will then analyze all the quantities offered by the Bidders in the IPO stage. If the total quoted quantity is greater than twice the Requisitioned Quantity, the Highest Bidder (H1) will be eliminated provided that the total quoted quantity after elimination is not less than or equal to twice the Requisitioned Quantity.

2) The Elimination process will be done for each of the requisition separately.

3) The shortlisted Bidder after elimination will be intimated individually by system generated emails only.

j. The Reverse auction will start within 120 minutes of opening of Initial Price Offers and shall continue for a period of next 120 minutes.

k. Provided that during the last 10 (ten) minutes before the scheduled close time of e-Reverse auction, if a price bid is received which is lower than the lowest prevailing price bid recorded in the system during e-Reverse auction, the close time of e- Reverse auction will be automatically extended by 10 (ten) minutes from the time of the last price bid received. This process of auto-extension will continue till there is a period of 10 (ten) minutes during which no price bid are received which is lower than the prevailing lowest price bid.

l. During the Reverse Auction the Bidders will have the option of reducing the tariff quoted by them in decrements of one paisa or multiples thereof and to increase the quantum quoted by them by 1 MW or multiples thereof. During the Reverse Auction the prevailing Lowest Tariff would be visible to all the Bidders.

m. The Bidders will have the option to increase the quantum of power upto corresponding to the value of EMD submitted along with IPO, but decrease the Tariff during the e-Reverse Auction process.

7. Contract Documents:-

BEST shall intimate to Bidder(s) regarding award of contract for supply of power (whose Bid has been accepted) through a Letter of Intent (LoI).

8. Compliance to the Terms & Conditions:-

The Bidders are advised to ensure that the Bid is fully compliant with the requirements specified and Terms and Conditions contained in the Bid Document. No deviation from these conditions is permissible and a Bid with any deviation shall be summarily rejected.

9. Earnest Money Deposit (EMD):-

a. The Bidder shall be required to submit EMD of Rs. 30,000 per MW per month (for 30 days, 24 hours and same shall be reduced on pro-rata basis) of offered capacity in the form of Bank Guarantee (Format Enclosed-**Annexure-III**) issued by any Nationalized/Scheduled Bank in favour of "The General Manager, Brihanmumbai Electric Supply & Transport Undertaking" payable at Mumbai, **valid till 31.08.2022**.

Example: For a requirement of 2 MW for 15 days for 4 hours, the EMD shall be = Rs. 30,000 x 2 MW x (15 days/30 days) x (4 hrs/24 hrs) = Rs. 5000/-

All costs/expenses/charges associated with the bidding, including bank guarantee etc. shall be borne by the Bidder. The validity of the EMD shall be extended by the Bidder if required by BEST.

BEST's bank details are as follows:

Name: BEST Undertaking

Account No.: 0106261008935

Name of Bank: Canara Bank

Branch name: Colaba

IFSC Code: CNRB0000106

b. The EMD shall be forfeited,

- If Bidder withdraws or modifies bid during Bid Validity Period.
- If Bidder fails to supply power after issue of Letter of Intent (LoI).
- Bidder failure in performing its contractual obligations.
- For Non submission of Contract Performance Guarantee by successful bidder.

c. The EMD of successful Bidder shall be released after submission of Contract Performance Guarantee as per Clause No. 10 below.

d. The EMD of unsuccessful bidder shall be released within 15 days from date of expiry of Bid validity period.

e. If it is observed that EMD of Bidder(s) has not been submitted or is less than the specified amount, the bid shall be rejected and Financial Bid submitted by such a Bidder shall not be opened.

No interest shall be paid on the Earnest Money Deposit.

10. Contract Performance Guarantee (CPG):-

a. Successful bidders are required to produce CPG within 7 days from date of Issue of Letter of Intent (LoI) to successful bidder for an amount of Rs 2 Lac per MW per Month (for 30 days, 24 hours) of contract period or part thereof. The CPG for the procurement of power on hourly basis shall be calculated on pro-rata basis as per the example given above for calculating EMD.

b. CPG to be issued by Nationalized/ Scheduled bank and valid for the period of contract and 1 month post expiry of contract. All costs/expenses/charges associated with CPG shall be borne by the Bidder. Refer Clause 9 above for BEST’s bank details.

c. In case of CPG submission delay within stipulated period, Bid security i.e. EMD shall be forfeited.

d. CPG to be released after 30 days of completion of contract period.

e. The CPG provided by the successful bidder shall be forfeited for not performing the contractual obligations.

11. BEST’s right- Acceptance/Rejection of Bid:-

This Bid document may be withdrawn or cancelled by BEST at any time without assigning any reasons thereof. BEST further reserves the right, at its complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account. The entire bidding process is subject to approval of Maharashtra Electricity Regulatory Commission.

12. Modification of the Bid Document:-

BEST reserves the right to modify any part of the Bid Document by issuing one or more amendments prior to the last date of submission of the Bid ("Amendment").

Any Amendment shall form part of the Bid Document, and shall be binding on bidders.

Any corrigendum/ clarifications with the Bid document and/or the Bidding process shall be published on the DEEP e-bidding portal only.

13. Bid Validity Period:-

The validity period of offer of Bidder shall be till **31.08.2022.**

14. Governing Law:-

All matters arising out of or in conjunction with the Bid Document and/or the bidding process shall be governed by and construed in accordance with Indian Law and the courts of Mumbai, Maharashtra shall have exclusive jurisdiction.

15. Condition Precedent:-

The Award of Contract i.e. Letter of Intent (LoI) is subject to approval, clearances, and permissions from all authorities i.e. Maharashtra State Electricity Regulatory Commission, RLDC / SLDCs etc.

16. Disclaimer:-

Neither BEST nor its employees or consultants shall be liable to any Bidder or any other person under any law including the law of contract, tort, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage which may arise, or be incurred, or suffered, in connection with the Bid, or any matter that may be deemed to form part of the Bid document or any other information supplied by or on behalf of BEST or its employees or consultants. For the avoidance of doubt it is expressly clarified that this Bid Document is an offer to Bid and is subject to the award of Letter of Intent (LoI) by BEST.

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Annexure-I

General Terms and Conditions

1. Quantum:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement. The Bidder(s) shall supply power as mentioned below to BEST:

Requisition No.	Contract Period		Slot/ Time (Hrs.)			Quantum (in MW)	Minimum Bid Quantity (in MW)	Delivery Point
	From	To	From		To			
1.	01-Aug-22	31-Aug-22	10:00	To	18:00	50	20	Maharashtra STU Periphery
2.	01-Sept-22	30-Sept-22	10:00	To	18:00	50	20	Maharashtra STU Periphery
3.	01-Oct-22	31-Oct-22	00:00	To	24:00	50	20	Maharashtra STU Periphery
4.	01-Oct-22	31-Oct-22	10:00	To	19:00	100	20	Maharashtra STU Periphery
5.	01-Nov-22	30-Nov-22	10:00	To	19:00	80	20	Maharashtra STU Periphery
6.	01-Dec-22	15-Dec-22	10:00	To	19:00	100	20	Maharashtra STU Periphery

2. Delivery Point:-

The Interface of Transmission network of Maharashtra State (i.e. Maharashtra STU Periphery).

3. Open Access Charges, transmission Losses and other Charges:-

All Open Access charges i.e. Transmission charges & losses, POC injection /withdrawal charges and losses, reliability support charges, Scheduling & operating charges of RLDC/SLDC, RLDC application fee or any other charges/fees upto delivery point shall be borne by the Bidder. The Open Access charges beyond delivery point (i.e. Maharashtra State Scheduling charges and Application charges) shall also be borne by the Bidder. Any revision in these charges if become applicable after the submission of Bids shall be on account of the Bidder.

BEST is a Long-Term Transmission System user of Maharashtra State. Hence, Maharashtra State transmission (InSTS) charges and losses are not applicable. Therefore, bidders while quoting need not factor Maharashtra State Transmission charges and Losses.

BEST does not have any Interstate LTOA/MTOA contract. Same may be factor into while quoting tariff and during application for Open Access.

If the power is being supplied through alternate source, additional charges and losses if any, due to cancellation of existing corridor and booking of new corridor etc., shall be to the account of the Bidder.

In case of reduction or cancellation of open access schedule, the defaulting party will bear all open access charges thereof in accordance with MERC (Transmission Open Access) Regulations, 2016 / procedure for Scheduling of bilateral transaction by CTU dated 28.01.2008 and subsequent amendments from time to time.

4. Open Access and Scheduling:-

After receipt of Letter of Intent (LoI) for supply of power, the Bidder has to apply for booking of transmission corridor for full contracted quantum for contracted period of supply for which is issued and acknowledge the acceptance of the same. Any revision in contracted quantum by the Supplier will not be accepted. There will be no liability on payment for BEST to pay the excess energy supplied by the Supplier on its own accord.

The Bidder shall book for open access on firm basis upto delivery point in accordance with procedure of bilateral transaction based on CERC's Open Access Regulations, 2008/

MERC (Transmission Open Access) Regulations, 2016 with amendments from time to time. Any liability on account of open access or any clarification on open access upto and beyond the delivery point will not come under purview of BEST.

BEST shall have the right to surrender/cancel open access at any time due to any unforeseen circumstances. Bidder shall have to respond immediately on request from BEST and arrange to surrender/cancel open access.

Both BEST and the Bidder shall schedule this power in full except in case of Force Majeure. The scheduling and dispatch of the power shall be coordinated with respective RLDCs/SLDCs as per the relevant provisions of IEGC/State Grid Code Regulations, 2020, frame work of MERC's Deviation Settlement Mechanism (DSM) and decisions of RLDCs, SLDCs and RPCs.

Final Energy accounting shall be as per the REA/SEA issued by the concerned RLDC/RPC/SLDC.

5. Tariff:-

Bidder shall quote firm price (Rs./kWh) at delivery point for each contracted period mentioned in the bid document and shall be inclusive of capacity charges, variable charges, trading margin, all taxes, duties, levy, cess etc. imposed by Central/State governments / Statutory authorities, etc..

The Tariff shall not change during contractual period if any tax / duty / levy / cess / charges / fees become applicable after the submission of bids.

Bidder shall quote the single tariff at delivery point up to three decimals.

In case Bidder being trader, should ensure that trading margin charged should be as per norm of appropriate regulatory commission.

6. Supply from alternative sources:-

In case of failure of the generation source, Bidder shall have to supply power from alternative source(s) with intimation to BEST. The supply from the alternative source(s), if any, would be made at the same tariff at which supplier has contracted power with BEST. Any additional liability in supply of power from alternative source(s) shall be borne by the Bidder.

7. Billing Cycle:-

Bidder(s) shall raise Provisional weekly energy bills based on daily schedule issued by Maharashtra SLDC / WRLDC. The blockwise energy schedules shall be rounded off to nearest second decimal point. The Final bill to be issued based on the REA published by the WRPC for Inter-state power and SEA based on DSM issued by MSLDC for Intra-state power. After receipt of REA of WRPC/ SEA statement of MSLDC, Final bill shall be raised by the Bidder for necessary adjustments.

8. Payment:-

Energy Bill:

BEST shall make payment to Bidder(s) in Bidder(s) bank account by RTGS within thirty (30) days from the receipt of correct bill, which will be the due date.

BEST will be eligible for prompt payment rebate @ 2% on energy bill amount, if the payment is made within seven (7) days (Excluding Sundays and Bank holidays) from the receipt of correct energy bill, through email/courier.

Compensation Bill:-

For any Compensation payable by BEST/Bidder, invoice shall be raised by Bidder/BEST as the case may be and payment shall be made within 30 days from the date of receipt of correct bill.

In case the due date falls on Sunday/ Bank holiday, then the next working day would be considered as due date. This is applicable to all above referred Bills.

Surcharge on delayed payment (if any) for all above Bills shall be as follows:

1.25% per month on all outstanding payments after the 30th day from the date of receipt of correct bill. The surcharge shall be calculated on a day-to-day basis for each day of the delay after due date.

9. Compensation Clause for failure to Supply/ Off-take the Quoted capacity:-

Both the parties would ensure that actual scheduling does not deviate by more than 15% of the contracted power as per the approved open access on monthly basis or actual period (if period is less than a month) during Contracted period.

Without prejudice to provision of force majeure, if Bidder fails to supply contracted quantum of energy as per approved open access on monthly basis in the Contracted period, Bidder shall pay compensation to BEST @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15 % in the Contracted period.

In case BEST defaults in off take of contracted quantum of energy as per approved open access on monthly basis in the Contracted period, BEST shall pay to Bidder @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15% in the Contracted period.

Allowable reduction in quantum of power, if required, shall be uniformly spread over the month as far as possible.

Compensation on account of shortfall in supply/Off-take will be settled separately on monthly basis and either party shall raise invoice to claim compensation. For any Compensation payable by BEST/Bidder as above, invoice shall be raised by

Bidder/BEST as the case may be within 1st week after completion of the month and payment shall be made within 30 days from the date of receipt of invoice.

Bidder must apply for Open access for full contracted capacity. If the Bidder does not apply for open access for full quantity, then this would be treated as default in supply of power by the Bidder and compensation provision will apply.

In case the Seller fails to offer the contracted power as per the Agreement to BEST and sells this power without BEST's consent to any other party, BEST shall be entitled to claim damages from the Seller for an amount equal to the higher of : (a) twice the Tariff as per the PPA for the corresponding contracted power ; and (b) the entire sale revenue accrued from Third Parties on account of sale of this contracted power. These damages shall be in addition to Compensation as mentioned above, for failure to supply the contracted capacity.

Further a complaint to this effect will be made by BEST to the concerned load dispatch centre. The Bidder/Seller shall be debarred from participating in power exchanges and also from scheduling of this power in any short term/ medium term *I* long term contracts from that generating station for a period of three months from the establishment of default, in the complaint. The period of debarment shall increase to six months for second default and shall be one year for each successive default.

10. Force Majeure:

A "Force Majeure Event" shall mean any event or circumstance or combination of events or circumstances (not otherwise constituting an Indian political Event)that adversely affects, prevents or delays any party in the performance of its obligation in accordance with the terms of this Agreement, but only if and to the extent that (i) such events and circumstances are not within the reasonable control of the affected party, and (ii) such events or circumstances could not have been prevented through employment of Prudent Utility Practices.

Neither party shall be in breach of its obligations pursuant to this understanding to the extent that the performance of its obligation was prevented, hindered or delayed due to Force Majeure Event, and without in any way prejudicing the obligation of either Party to make payments of amounts accrued due prior to the occurrence of the event of Force Majeure, which shall be payable on the original Due Date.

Force Majeure events shall include but not limited to:

a) Act of war, invasion, armed conflict, blockade, revolution, riot, insurrection or civil commotion, terrorism, sabotage, fire, explosion or criminal damage;

b) Act of God, including fire, lightning, cyclone, typhoon, flood, tidal wave, storm, earthquake, landslide, epidemic, pandemic or similar cataclysmic event;

c) Any curtailment/suspension/non-availability of transmission capacity by intervening SLDCs and/or RLDCs;

d) Any restriction imposed by any RLDCs;

e) Regulatory intervention in the matter of power trading as also orders from CERC/ SERCs/ Appellate Tribunal of Electricity/High Courts/ Supreme Court particularly related to rates at which power can be sold/ purchased/traded. This will also include regulations / orders already issued but yet to be conclusively enforced. Any directive by Government of Maharashtra not to export power outside Maharashtra state boundary.

11. Change in Law:-

Since the tender is invited for short term period at firm price, any variation in price due to any reasons what so ever, including change in Law, will not be applicable.

12. Details of the Bidder(s) (In case of the Bidder being a trading licensee):-

In case the Bidder is trading licensee, Agreement with the seller/generator shall be attached with the Bid.

13 Bid Validity:-

The validity period of offer of Bidder shall be till **31.08.2022.**

14 BEST's Rights:

BEST reserves its right to accept or reject any Offer whether fully or partially without assigning any reasons pursuant to this Bid. The Bidder on the other hand binds himself to sell power in part or whole at the option of the BEST.

15. Resolution of Dispute:-

Any dispute or differences arising under, out of, or in connection with this Bid document shall be subjected to exclusive jurisdiction of competent court at Mumbai only. In any event BEST shall not be responsible for any dispute between the Bidder (in case of bidder being the trading licensee) and the Generator.

16. Arbitration:

Subject to the statutory provisions for arbitration under the Electricity Act, 2003, all other differences or disputes between the parties arising out of or in connection with this Bid document shall be settled through Arbitration subject to the provisions of the Arbitration and Conciliation Act, 1996. The venue for Arbitration shall be at Mumbai.

Notwithstanding any legal dispute, disagreement or difference, the parties here to, continue to perform the respective obligations under the terms of this agreement.

17. Condition Precedent:-

The Letter of Intent (LoI) is subject to approval, clearances and permissions from all authorities i.e. Maharashtra Electricity Regulatory Commission (MERC), RLDC/ SLDCs.

18. Acceptance of Offer:-

BEST reserves the right to reject any or all the Bids without assigning any reasons what so ever. It is also not binding on BEST to disclose any analysis report on offers. Once the acceptance of the offer is conveyed, the Bidder(s) would be bound to supply the power as per the contract. BEST reserves the right to enter into Letter of Intent (LoI) with one or more of the Suppliers.

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Annexure-II

To be given on the official letter head of the Bidder

Acceptance of Terms and Conditions of Bid Document
(To be signed by the authorized person of the bidder)

We/I have carefully gone through the Bid Document No. ……………..…….. dated…………and satisfied ourselves/myself and hereby confirm that our/my offer strictly conforms to the requirements of the Bid Document and all the terms and conditions are acceptable to us.

Signature :-

Name :-

Status :-

Whether Authorized Yes/No

Power of Attorney of Bidding Company
Authorizing the signatory to sign the bid

Name & Seal of Bidding Company

Format of Covering Letter

(The covering letter should be on letter head of bidding company/ lead member of the bidding consortium)

Date……………………..

From………………………… (Insert Name and address of bidding company)
………………………….
Tel No :-
Fax:-
Email address :

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

Sub: Bid for Purchase of power by BEST on short term Basis i.e. for the period from……….. to……….through e-Tender & e-Reverse Auction process in response to Bid Document No. ……………. dated ………..

Dear Sir,

We, the undersigned, ………..(insert name of the bidder) having read, examined and understood in detail the Bid document for purchase of power by BEST on short term basis i.e. for the period from……….. to……….through E-tendering process hereby submit our bid.

a. We give unconditional acceptance to the Bid Document No…..………………dated ……………(insert date), attached thereto, issued by the BEST.
In token of our acceptance to the Bid Document, the same have been initiated by us and enclosed to the bid. We shall ensure provisions of the Bid Document shall be binding on us.

b. EMD:
We have enclosed the EMD of Rs……………….(insert amount), in the form of Bank Guarantee dated …….. drawn on ………………(insert name of Bank) and payable at Mumbai.
The offered quantum of power by us is …………MW(insert total capacity offered).

c. We have submitted our financial bid strictly as per Bid Document without any deviations, conditions and without mentioning any assumptions or notes for the financial bid in the said format.

d. Acceptance:-
We hereby unconditionally and irrevocably agree and accept that the decision made by the BEST in respect of any matter regarding or arising out of the Bid shall be binding on us. We hereby expressly waive any and all claim in respect of Bid process.

We confirm that there are no litigations or disputes against us, which materially affect our ability to fulfill our obligations with regard to supply of power.

e. Contact person:
Details of contact person are furnished as under:
Name ………………………………
Designation………………………..
Company………………………….
Address…………………………….
Phone Nos …………………………
Fax Nos……………………………..
Email Address……………………….

f. It is confirm that our bid is consistent with all the requirements of submissions as stated in the Bid Document and subsequent communications from BEST.

g. The information submitted in our bid is complete, strictly as per the requirement stipulated in the Bid Document and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our bid.

h. We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of ………days from the bid deadline (i.e. till……..day of………2022).

i. We confirm that we have not taken any deviations so as to be deemed non responsive with respect to the provisions of this Bid Document.

Dated ……..day of………2022

Thanking You.

Your's Faithfully,

(name , designation and signature of authorized person in whose name power of attorney/Board Resolution is issued by the Bidder)

Annexure-III

DRAFT FORMAT OF THE BANK GURANTEE FOR EMD

(The Bank Guarantee should be executed on a non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution along with a Confirmatory Letter from the Regional office of the Bank concerned in enclosed format.)

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

In consideration of ______________ (name of Bidder to be inserted) agreeing to undertake the obligations under the terms and conditions of Bid Document No:_____________ dated______ signed by________________________(name of bidder to be inserted) having its office at ________________ .The_________________ (Insert Guarantor Bank Name) having its registered office at __________________ hereinafter referred to as "Guarantor Bank" hereby agrees unequivocally, irrevocably and unconditionally to pay to BEST Undertaking having its office at BEST Bhavan, BEST Marg, Mumbai-400001 forthwith on demand in writing from the General Manager, BEST Undertaking or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees___________ Only with respect to the offered Capacity of______MW as per the terms and conditions of the Bid Document No. ________________dated_________.

This guarantee shall be valid and binding on the Guarantor Bank upto and including_____________________(Insert date of validity of EMD) and shall in no event not be terminable by notice or any change in the constitution of the Bank or the term of the Bid Document No.______________ dated_______ signed by__________ or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs._______________(Rs._________/-) only. Our Guarantee shall remain in force until _____________. BEST Undertaking shall be entitled to invoke this Guarantee up to _________________, by issuance of a written demand to invoke this guarantee.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand from BEST Undertaking, made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to BEST Undertaking.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by__________ (name of Bidder to be inserted). The Guarantor Bank shall not require BEST Undertaking to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against the Procurer(s) in respect of any payment made hereunder.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring, liquidation, winding up, dissolution or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly BEST Undertaking shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against_________ (name of Bidder to be inserted)to make any claim against or any demand on the ___________ (name of Bidder to be inserted)or to give any notice to or to enforce any security held by BEST Undertaking or to exercise, levy or enforce any distress, diligence or other process against__________(name of Bidder to be inserted).

The Guarantor Bank acknowledges that this BANK GUARANTEE is not personal to BEST Undertaking and may be assigned, in whole or in part, (whether absolutely or by way of security) by BEST Undertaking to any entity to whom it is entitled to assign its rights and obligations under the Bid document.

The Guarantor Bank hereby agrees and acknowledges that BEST Undertaking shall have a right to invoke this Bank Guarantee either in part or in full, as it may deem fit.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs._____________ (Rs ___________/-) only and it shall remain in force until______________.

This BANK GUARANTEE shall be extended from time to time for such period, as may be desired by______________ (name of Bidder to be inserted). We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if BEST Undertaking serves upon us a written claim or demand.

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Mumbai shall have exclusive jurisdiction.

In witness whereof the Bank, through its authorized officer, has set its hand and stamp on his____________ day of_____________ at___________.

Witness :-

(1) _______________________________ The Duly Constituted Attorney

(Signature)

____

(Name of the witness)

____

(Address of the witness)

____

(Signature)

____

(Name & Designation of the person)

For ____________________________

(Name of the Bank)

(2) _______________________________

(Signature)

____

(Name of the witness)

____

(Address of the witness)

____

(Name of the Bidder)

The Bank and the said Messrs.

Witness: _______________________________

____

(Signature)

____

(Name of the witness)

____

(Address of the witness)

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Bid Sheet

Select Type :	Medium Term Bid Sheet
Select Event :	BEST/Short/22-23/RA/97
Event Ref. No. :	BEST/Short/22-23/RA/97
Period :	08/07/2022 12:00:00 To 08/07/2022 14:00:00

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
1	1 (Maharashtra STU Periphery)	50.0(MW)	From 01.08.2022:10.00 to 31.08.2022:18.00	Tata Power Trading Company Limited/74213	20	5.85	08/07/2022 14:09	Prayagraj Power Generation Company Limited (PPGCL)
				Adani Enterprises Ltd/335680	50	5.86	08/07/2022 14:08	Raipur Energen Limited (REL)
				Tata Power Trading Company Limited/74174	50	7.68	08/07/2022 13:47	Jindal Power Limited (JPL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74213	20	5.85	RA
2	Adani Enterprises Ltd/335680	30	5.86	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
2	2 (Maharashtra STU Periphery)	50.0(MW)	From 01.09.2022:10.00 to 30.09.2022:18.00	Tata Power Trading Company Limited/74213	20	7.5	08/07/2022 13:54	Prayagraj Power Generation Company Limited (PPGCL)
				Tata Power Trading Company Limited/74174	50	7.68	08/07/2022 13:56	Jindal Power Limited (JPL)
				Adani Enterprises Ltd/335680	50	7.98	08/07/2022 13:53	Raipur Energen Limited (REL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74213	20	7.5	RA
2	Tata Power Trading Company Limited/74174	30	7.68	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
3	3 (Maharashtra STU Periphery)	50.0(MW)	From 01.10.2022:00.00 to 31.10.2022:24.00	Tata Power Trading Company Limited /74187	25	8.66	08/07/2022 14:21	Jindal India Thermal Power Limited (JITPL)
				MANIKARAN POWER LIMITED/102094	25	8.66	08/07/2022 14:21	BLA Power Private Limited Unit-2, Village Niwari, PO Khursipar, Tehsil Gadarwara, Narsinghpur, Madhya Pradesh-487551
				Tata Power Trading Company Limited/74174	50	8.72	08/07/2022 14:12	Jindal Power Limited (JPL)
				Adani Enterprises Ltd/335680	20	9.56	IPO 01/07/2022 15:59:20	Raipur Energen Limited (REL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited /74187	25	8.66	RA
2	MANIKARAN POWER LIMITED/102094	25	8.66	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
4	4 (Maharashtra STU Periphery)	100.0(MW)	From 01.10.2022:10.00 to 31.10.2022:19.00	Tata Power Trading Company Limited/74213	20	7.5	08/07/2022 13:58	Prayagraj Power Generation Company Limited (PPGCL)
				Tata Power Trading Company Limited/74174	100	7.68	08/07/2022 13:58	Jindal Power Limited (JPL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74213	20	7.5	RA
2	Tata Power Trading Company Limited/74174	80	7.68	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
5	5 (Maharashtra STU Periphery)	80.0(MW)	From 01.11.2022:10.00 to 30.11.2022:19.00	Tata Power Trading Company Limited/74213	20	7.29	08/07/2022 14:06	Prayagraj Power Generation Company Limited (PPGCL)
				MANIKARAN POWER LIMITED/102094	25	7.3	08/07/2022 14:02	BLA Power Private Limited Unit-2, Village Niwari, PO Khursipar, Tehsil Gadarwara, Narsinghpur, Madhya Pradesh-487551
				Tata Power Trading Company Limited/74174	80	7.68	08/07/2022 13:49	Jindal Power Limited (JPL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74213	20	7.29	RA
2	MANIKARAN POWER LIMITED/102094	25	7.3	RA
3	Tata Power Trading Company Limited/74174	35	7.68	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
6	6 (Maharashtra STU Periphery)	100.0(MW)	From 01.12.2022:10.00 to 15.12.2022:19.00	Tata Power Trading Company Limited/74213	20	7.29	08/07/2022 14:06	Prayagraj Power Generation Company Limited (PPGCL)
				MANIKARAN POWER LIMITED/102094	25	7.3	08/07/2022 14:02	BLA Power Private Limited Unit-2, Village Niwari, PO Khursipar, Tehsil Gadarwara, Narsinghpur, Madhya Pradesh-487551
				Tata Power Trading Company Limited/74174	100	7.68	08/07/2022 13:50	Jindal Power Limited (JPL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74213	20	7.29	RA
2	MANIKARAN POWER LIMITED/102094	25	7.3	RA
3	Tata Power Trading Company Limited/74174	55	7.68	RA

Reverse Auction Participated Bidders Details

Sl.No.	Bidder Ref. No.	Company Name	Contact Person	Email
1	Tata Power Trading Company Limited/74174	Tata Power Trading Company Limited	ANUJESH SHAHI	tptclmarketing@tatapower.com
2	Tata Power Trading Company Limited /74187	Tata Power Trading Company Limited	ANUJESH SHAHI	tptclmarketing@tatapower.com
3	Tata Power Trading Company Limited/74213	Tata Power Trading Company Limited	ANUJESH SHAHI	tptclmarketing@tatapower.com

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
4	MANIKARAN POWER LIMITED/102094	MANIKARAN POWER LIMITED	PRAVIN LEE ABRAHAM	bilateral.del@manikaranpowerltd.in				
5	Adani Enterprises Ltd/335680	Adani Enterprises Ltd	GUNJAN RAMU THAKRE	gunjan.thakre@adani.com				

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
World Trade Centre, Centre No.1, 13th Floor, Cuffe Parade, Mumbai 400005.
Tel. 022 22163964/65/69 Fax 22163976
Email: mercindia@merc.gov.in Website: www.merc.gov.in

Case No. 151 of 2022

Petition of Brihanmumbai Electric Supply & Transport Undertaking (BEST) seeking approval for Tariff discovered through Competitive Bidding for Short -term bilateral Power purchase for the period August, 2022 to December, 2022.

Coram
Sanjay Kumar, Chairperson
I. M. Bohari, Member
Mukesh Khullar, Member

Brihanmumbai Electric Supply and Transport Undertaking: Petitioner

Appearance:

For Petitioner: Shri. N.N Chougule (Rep)

ORDER

Date: 24 August, 2022

1. Brihanmumbai Electric Supply and Transport Undertaking (**BEST**) has filed this Case on 21 July, 2022 under Sections 63 of the Electricity Act, 2003 (**EA, 2003)** seeking approval for Tariff discovered through Competitive Bidding for Short -Term bilateral Power Purchase for the period August, 2022 to December, 2022.

2. **BEST's main prayers are as under:**

   a) *To admit the present Petition.*

   b) *Hon'ble Commission may consider expediting hearing in the present Petition;*

   c) *Hon'ble Commission may accord approval for tariff discovered through competitive bidding process undertaken by BEST for short term bilateral power purchase for the period from August, 2022 to December, 2022;*

   d) *Hon'ble Commission may accord approval for power procurement from short term sources at the rate of Rs 8.00/kWh for FY 2022-23;*

   ……..."

3. **BEST in its Petition has stated as follows:**

3.1 The Commission, vide its MYT Order in Case No. 324 of 2019 dated 30 March, 2020 has approved power procurement and cost of such procurement for FY2022-23 from various sources, including Renewable power. Details of the same are as below:

Particulars	MYT Petition			Approved in the Order		
	Quantum (MU)	Total Cost (Rs. Cr.)	Avg. Rate (Rs. / kWh)	Quantum (MU)	Total Cost (Rs. Cr.)	Avg. Rate (Rs. / kWh)
TPC-G	3,567.89	1,566.55	4.39	3,510.94	1,660.96	4.73
Walwahan solar Energy Maharashtra (Erstwhile Welsun)	31.50	26.96	8.56	31.50	26.96	8.56
Manikaran PowerLimited (Medium term)	744.60	332.03	4.46	744.60	332.03	4.46
Solar Energy	312.61	102.85	3.29	307.74	89.25	2.90
Non-Solar Energy				500.37	143.61	2.87
Bilateral PowerPurchase	498.35	199.34	4.00	0.00	0.00	4.00
REC Non-solar	507.38	171.68	3.38	-	-	-
Standby charges	-	102.64	-	-	98.53	-
Transmission Charges	-	280.85	-	-	256.72	-
MSLDC Charges	-	1.45	-	-	1.27	-
Total Power Purchase	**5,154.96**	**2,784.35**	**5.40**	**5,095.15**	**2,609.33**	**5.12**

3.2 After approval of the Commission vide Order dated 26 April, 2021 in Case No. 16 of 2021, BEST and Solar Energy Corporation of India (SECI) have entered into PSA for procurement of 400 MW Wind-Solar hybrid power by BEST from SECI at Tariff of Rs. 2.48/kWh discovered through competitive bidding for 25 years. Actual power flow from this project is anticipated to commence from February, 2023. Further additional 300 MW standalone solar PSA will be executed by BEST with SECI to meet the future obligation.

3.3 Since March, 2020, BEST's demand had drastically reduced arising out of COVID-19 pandemic. However, after lifting of restrictions on account of Covid-19, the economic activities are anticipated to increase the electricity demand. Considering this factor and the period of August, 2022 to December, 2022, BEST's demand is likely to increase.

3.4 BEST's peak demand in current financial year (FY 2022-23) was 890 MW in April, 2022. BEST's anticipated demand at day peak time will be approximately 861 MW during ensuing period. As per its Long/Medium term PPA, the ex-bus availability of its peak availability is 763 MW.

3.5 BEST has allocation of 90 MW from TPC's Unit-7 (180 MW) gas based generating unit. In recent years, due to change in priority for the power sector, the allocation of APM gas to TPC's Trombay Units from GAIL has considerably reduced. This has resulted into lower generation from TPC's Unit-7 as seen from Plant Load Factor (PLF) of the plant as tabulated below:

Month	Aug-21	Sept-21	Oct -21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22
PLF	9%	64%	79%	71%	68%	19%	65%	44%	72%	47%

3.6 It is anticipated that the trend of lower generation from the Unit- 7 may prevail in ensuing period due to lower availability of APM gas and therefore, the anticipated shortfall from this source to BEST will be up to 40 MW.

3.7 TPC's Hydro resource is limited and is required to be used in the evening and night periods where the rates of the Power Exchange are on higher side. Thus, during day peak, availability of hydro is low.

3.8 Considering the volatility in the short-term power market, particularly during high demand season and as experienced during month of April and May, 2022, it is necessary to tie-up bilateral contracts to ensure reliability to meet the anticipated demand in ensuing period.

3.9 Therefore, BEST invited e-tender for bilateral power purchase for quantum of 50 MW to 150 MW at different time slots (00:00 to 24:00 hrs (RTC), 10:00 to 18:00 hrs and 10:00 to 19:00 hrs) for the period from August, 2022 to December, 2022 on DEEP portal on 27 June, 2022.

3.10 This e-tender is in line with Ministry of Power's Guidelines dated 30 March, 2016 for short-term procurement of power by Distribution Companies through tariff-based competitive bidding. The validity of bid offer is till 31 August 2022. Detail of this e-tendering process with price discovery after Reverse Auction is annexed with the Petition. The outcome of the bidding process is summarized below:

Sr No	Contract Period From - To	Slot/Time (Hrs.)	Bid Quantum in MW	Successful Bidder	Source	Rate in Rs./ kWh	Allotted Quantum in MW
1	01-Aug-22 to 31-Aug-22	10:00 to 18:00	50	Tata Power Trading Co. Ltd (TPTCL)	Prayagraj Power Generation Co. Ltd. (PPGCL)	5.85	20
				Adani Enterprises Ltd	Raipur Energen Ltd. (REL)	5.86	30
2	01-Sep-22 to 30-Sept-22	10:00 to 18:00	50	TPTCL	PPGCL	7.50	20
				TPTCL	Jindal Power Ltd (JPL)	7.68	30
3	01-Oct-22 to 31-Oct-22	00:00 to 24:00 (RTC)	50	TPTCL	Jindal India Thermal Power Ltd. (JITPL)	8.66	25
				Manikaran Power Ltd. (MPL)	BLA Power Pvt Ltd.	8.66	25
4	01-Oct-22 to 31-Oct-22	10:00 to 19:00	100	TPTCL	PPGCL	7.50	20
				TPTCL	JPL	7.68	80
5	01-Nov-22 to 30-Nov-22	10:00 to 19:00	80	TPTCL	PPGCL	7.29	20
				MPL	BLA Power Pvt Ltd	7.30	25
				TPTCL	JPL	7.68	35
6	01-Dec-22 to 15-Dec-22	10:00 to 19:00	100	TPTCL	PPGCL	7.29	20
				MPL	BLA Power Pvt. Ltd.	7.30	25
				TPTCL	JPL	7.68	55

3.11 After considering the discovered price and allocated quantity to successful bidders, the estimated average rate of power purchase cost for total 124.60 MU for the period from 1 August, 2022 to 15 December, 2022 will be Rs.7.72/kWh. The discovered price is in line with the results of bids floated on DEEP portal by other Utilities for aforesaid period.

3.12 BEST intends to procure total allocated bid quantum at discovered price through competitive bidding for the period from August, 2022 to December, 2022 to ensure reliability of power supply during ensuing period.

3.13 Accordingly, LoI/draft PPA is issued to the successful bidders within the timeframe as specified in MoP Guidelines on 19 July, 2022.

3.14 Any shortfall of the power in the availability thereon on real-time basis will be met through power purchase through power exchange platform.

3.15 The Commission, vide its Order in Case No. 46 of 2022 dated 6 April, 2022, has approved rate of Rs. 5.12/kWh for the power purchase from Bilateral source in FY 2022-23. The relevant para is reproduced as under:

> *"10.8 Further, above average tariff of Rs. 5.12/kWh discovered through competitive bidding shall act as ceiling tariff for procurement of short-term power through competitive bidding process for FY 2022-23. Any tariff discovered below such ceiling shall be considered as deemed adopted as per provisions of competitive bidding guidelines notified by the Central Government for short-term power procurement."*

3.16 Further, Ministry of Power's Guidelines dated 30 March, 2016 for short-term procurement of power by Distribution Companies through tariff-based bidding process stipulate that if the quantum of power procured and tariff determined are within the blanket approval granted by the Commission in ARR of the respective year, then the same will be considered to have been adopted by the Commission. In all other cases, the Procurer(s) have to submit a Petition to the Commission for adoption of tariff.

3.17 Though the discovered rates of Short-term Bilateral Power Purchase for the period from August, 2022 to December, 2022 are higher than the Commission's approved rate, these discovered rates are lower than the variable cost (about Rs.10.5/kWh) of TPC-G's Unit-5/Unit-8.

3.18 The MoP has given directions vide Notification No.23/13/2021-R&R (Pt-1) dated 5 May, 2022 to coal based Generating companies that they should mandatorily use 10% of imported coal for blending purpose. This has resulted into increase of the fuel cost and subsequently higher quotes for this tender. The coal shortage issue is not likely to get resolved in near future. Thus, rates seem to be in anticipation to the future coal availability scenario.

3.19 In the past, power exchange rates surged to the capping rates. Even after quoting at ceiling rates the bids were not fully cleared. It resulted in curtailment of the drawal schedule. Hence it was decided to purchase the shortfall quantum through competitive bidding process of

DEEP portal. This power, though it is at a higher rates will avoid the precarious conditions arising out of uncertainty in the power exchange market.

3.20 Any shortfall over and above this will be met through RTM/DAM/TAM segment where BEST will ensure that short term power purchase is done in economical and judicious manner.

3.21 In view of above, it is requested to approve the tariff discovered through Competitive Bidding for Short -term bilateral Power purchase for the period August, 2022 to December, 2022.

4. At the time of E-hearing held on 29 July, 2022:

4.1 BEST reiterated the submission made in the Petition. BEST stated that it conducted the competitive bidding process for short term power procurement on DEEP portal for the period of August, 2022 to December, 2022 and requests the Commission to adopt the same.

4.2 In order to decide the Petition, the Commission directed BEST to clarify the following:

a) Whether the demand projections are as per approved demand projections in MYT Order in Case No. 324 of 2019 or there is any deviation from approved projections?

b) Details of demand supply position for last 3 years for the months under consideration along with availability from contracted sources and short-term power procured during that period shall be submitted.

c) Basis on which it has projected outages of contracted generating units. Details of generator outages for the previous 3 years of the same month also needs to be provided along with reasons for such outages.

d) Considering transmission constraint to bring power into Mumbai from outside, BEST shall clarify whether it envisages any difficulties with proposed power procurement quantum?

4.3 Considering urgency of the matter as highlighted in the Petition, BEST was directed to submit above details on priority within 3 days.

5. BEST in its submission dated 2 August, 2022 has stated as under:

5.1. The clarification to the queries of the Commission raised during e-hearing on 29 July, 2022 are as under:

5.2. <u>Query 1: BEST to clarify whether the demand projections are as per approved demand projections in MYT Order in Case No. 324 of 2019 or there is any deviation from approved projections</u>**?**

a) During MYT Petition, BEST had submitted 973.23 MW Peak Demand and 4726.99

MU Energy Sales projection for FY 2022-23. The Commission has approved the same and projected the 5095.15 MU Energy requirements at G<>T interface for FY 2022-23.

b) Since March, 2020, BEST's demand drastically reduced because of COVID-19 pandemic. However, after lifting of restrictions placed in Mumbai under Government of Maharashtra's COVID-19 Guidelines, the economic activities are anticipated to increase the electricity demand. Considering this factor and the period of August, 2022 to December, 2022, BEST's demand is anticipated to rise.

c) BEST's peak demand in FY 2022-23 is 890 MW in April, 2022. BEST's anticipated Demand at day peak time will be approximately 861 MW during ensuing period. For demand prediction for each month of the period from August, 2022 to December, 2022, the successive peak demands (excluding particular spikes in demand) of corresponding month in previous three years from year 2017 to year 2019 were considered.

d) For the months of September, 2022 and December, 2022, average of respective months for past three years of 2017 to 2019 works out much higher than the actual monthly demands of the corresponding months of the Year 2021. Hence, the realistic demand of three years is considered for projection.

e) Comparison of pre-pandemic demand Vs demand projection at T<>D in MW is as below:

Month/ Year	Pre-pandemic				Actual	Projected
	2017	**2018**	**2019**	**Average**	**2021**	**2022**
Jan	650.0	706.6	635.6	664.1	628.1	
Feb	731.1	752.5	663.9	715.8	637.6	
March	845.8	832.4	794.4	824.2	722.5	
April	858.4	896.8	862.3	872.5	692.2	
May	916.4	911.5	872.7	900.2	655.0	
June	916.9	938.8	927.4	927.7	684.7	
July	816.9	789.0	812.4	806.1	716.3	
Aug	808.6	785.2	798.6	797.5	695.6	**797.0**
Sept	878.5	808.6	786.0	824.4	691.7	**784.0**
Oct	868.8	892.6	851.5	871.0	778.5	**861.0**
Nov	757.7	808.5	791.3	785.9	760.9	**785.0**
Dec	713.0	719.9	760.1	731.0	652.3	**713.0**

f) The provisional transmission loss of 3.18 % for year 2022 is considered. Accordingly, the estimated peak power demand projection is considered for August, 2022 to December, 2022 which is stated as follows:

Projected peak Demand in MW	Aug, 2022	Sep, 2022	Oct, 2022	Nov, 2022	Dec, 2022
T<>D level in MW	797	784	861	785	713
G<>T level in MW	823	810	889	811	736

g) The expected MUs will be in line with approved energy requirement of 5095.15 Mus at G<>T interface for FY 22-23 in the MYT Order in Case No. 324 of 2019 as shown below:

MUs	Actual		Projected*	

Month	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
G<>T	456	478	438	401	394	422	508	435	400	346	363	452	5094

h) As such there will not be any deviation from approved projections of the MYT Order. BEST's ex-bus generation capacity tied-up with TPC-G is 676.69 MW from Unit 5, 7, 8 and Hydro. Due to less availability of APM gas, U-7 generation is anticipated between 95 MW to 110 MW.

i) TPC-G's peak availability (excluding hydro) during August, 2022 to 15 December, 2022 period will be around 379 MW. Also, in real time hydro generation varies from 0 to 447 MW on 15-min block to block basis. Therefore, peak share of allocation from TPC's Hydro generation is 226 MW. Hence, peak hours availability considered from TPC-G is around 613 MW.

j) BEST's ex-bus generation availability of 100 MW from Manikaran (through M/s Saiwardha Power) is considered on RTC basis. Availability of up to 15 MW solar power from Walwhan energy during day hours has been considered in the availability as per typical solar pattern. Therefore, total availability of power works out to 728 MW.

k) In order to meet the power shortfall requirement, based on past experience, it is proposed to procure Bilateral power in the time slots on RTC (00:00 to 24:00 hrs), Peak day period (10:00 to 18:00 hrs.) and (10:00 to 19:00 hrs) to optimize power purchase cost.

l) The summary of the month-wise short term Bilateral power requirement is given below:

Time Slot	Aug,22	Sept,22	Oct,22	Nov,22	Dec,22
Estimated Peak demand (in MW)	823	810	889	811	736
Total availability (in MW)	728	728	728	728	636
Shortfall (in MW)	96	82	161	83	100
Proposed procurement					
00:00 to 24:00 Hrs, RTC (in MW)	-	-	50	-	-
10:00 to 18:00 Hrs (in MW)	50	50	-	-	-
10:00 to 19:00 Hrs (in MW)	-	-	100	80	100
Total energy requirement (in MU)	12.40	12.00	65.10	21.60	13.50
Total MU	**124.60**				

m) In the event of increase in BEST's demand over the predicted demand or in case of lesser power availability from contracted sources or in order to optimize the overall power purchase cost, the additional power will be purchased through Power exchanges.

5.3. <u>Query 2: Details of demand supply position for last 3 years for the months under consideration along with availability from contracted sources and short-term power procured during that period shall be submitted.</u>

a) Details of demand supply position for last 3 years for the months under consideration along with availability from contracted sources and short-term power procured during that period is as follows:

Year-2019					
Particulars	Aug-19	Sept-19	Oct-19	Nov-19	Dec-19
BEST's peak demand in MW at G<>T	826	813	877	818	786
Source-wise availability in MW					
TPC-G (Total Availability)	648	648	648	648	557
TPC-G (Actual generation)	597	409	474	426	545
Manikaran (SWPGL)	0	0	0	0	0
Short-term Bilateral	0	0	210	100	0
RE (Solar/Non-Solar)	21	20	21	19	19
Power Exchange	185	250	20	120	210

Year-2020					
Particulars	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
BEST's peak demand in MW at G<>T	580	669	697	660	664
Source-wise availability in MW					
TPC-G (Total Availability)	557	557	648	648	648
TPC-G (Actual generation)	424	316	509	519	422
Manikaran (SWPGL)	100	100	100	100	100
Short-term Bilateral	0	0	0	0	0
RE (Solar/Non-Solar)	12	9	9	13	12
Power Exchange	20	120	118	20	40

Year-2021					
Particulars	Aug-21	Sept-21	Oct-21	Nov-21	Dec-21
BEST's peak demand in MW at G<>T	718	712	804	786	674
Source-wise availability in MW					
TPC-G (Total Availability)	558	648	648	648	557
TPC-G (Actual generation)	482	448	441	488	462
Manikaran (SWPGL)	70	68	55	93	100
Short-term Bilateral	0	0	0	0	98
RE (Solar/Non-Solar)	12	14	13	11	11
Power Exchange	155	153	300	164	0

5.4. Query 3: BEST also needs to provide basis on which it has projected outages of contracted generating units. Details of generator outages for the previous 3 years of the same month also needs to be provided along with reasons for such outages.

a) Projected outages of TPC-G generating units for the period from August, 2022 to December, 2022 is considered as intimated by the generator.

b) Details of generator outages for the previous 3 years of the same months along with reasons is also submitted.

5.5. Query 4: Considering transmission constraint to bring power into Mumbai from outside, BEST shall clarify whether it envisages any difficulties with proposed power procurement quantum?

a) Considering transmission constraint to bring power into Mumbai from outside, BEST has not envisaged any difficulties with proposed power procurement quantum. Since, BEST's base transmission capacity right is 823 MW for FY 2022-23. Accordingly, BEST pays Rs 257 Crores towards transmission charges (vide MERC Order No 327 of 2019).

b) As regards Mumbai tie line, assuming 2400 MW of ATC, BEST can source power up to 551 MW from outside Mumbai. The computation of BEST's share in the ATC is given below.

	AVG CPD/NCPD (MW)	**% Share in Mumbai Tie-line**	**Transmission Charges (Rs Cr)**	**ATC Share in MW**
TPC-D	830	23.15%	259.0	556
BEST	823	22.95%	257.0	551
AEML-D	1545	43.08%	482.0	1034
Railway	388	10.82%	121.0	260
Total	3586	100.00%	1119.0	2400

c) During the month of April, 2022, the maximum Mumbai demand catered is 3851 MW. Out of this 2260 MW of demand was met through external sources outside Mumbai region.

d) In view of above submission and for the reasons mentioned in the main Petition, BEST revises its prayers as follows:

a) To consider the present submission under the Petition in Case No. 151 of 2022;

b) Hon'ble Commission may accord approval for tariff discovered through competitive bidding process on DEEP Portal undertaken by BEST for short term bilateral power purchase for the period from August, 2022 to December, 2022 mentioned in para 6.0 of the main petition;

c) Hon'ble Commission may adopt and approve the short term power procurement for the month of August, 2022 to December, 2022 at the discovered rate in the range of Rs. 5.85 to Rs. 8.66 per unit and the quantum in the range of 50 MW to 150 MW (the estimated average rate of power purchase cost for total 124.60 MUs for the period from 01st August'2022 to 15th December'2022 will be Rs.7.72/kWh) under competitive bidding process in DEEP portal for the Bid invited by BEST as mentioned in para 6.0 of the main petition;

d) Hon'ble Commission may accord approval for power procurement from short term sources at the rate of Rs 8.00/kWh for FY 2022-23;

6. During the E-hearing held on 5 August 2022, BEST reiterated their submissions made in the Petition and requested the Commission to approve proposed short term power procurement.

<u>Commission's Analysis and Ruling:</u>

7. Present petition has been filed by the BEST seeking approval for tariff discovered through Competitive Bidding for Short Term Power purchase for the period of August, 2022 to December, 2022.

8. Considering the submissions made in the matter, the Commission frames following issues for its considerations:

8.1. Provisions under which Short Term Power procurement of Distribution Licensee requires approval of the Commission.

8.2. Whether the quantum of additional short term power procurement proposed by BEST is justified?

8.3. Whether the discovered tariff is consistent with the market trend?

The Commission is addressing these issues in following paragraphs.

9. Issue A: - Provisions under which Short Term Power procurement of Distribution Licensee requires approval of the Commission

9.1. The Commission notes that MERC MYT Regulations, 2019 which is applicable for control period of FY 2020-21 to FY 2024-25, has following provisions related to the additional power procurement by Distribution Licensee:

> "*22.1 The Distribution Licensee may undertake additional power procurement during the year, over and above the power procurement plan for the Control Periodapproved by the Commission, in accordance with this Regulation.*
>
> *22.2 Where there has been an unanticipated increase in the demand for electricity or a shortfall or failure in the supply of electricity from any approved source of supply during the Year or when the sourcing of power from existing tied-up sources becomes costlier than other available alternative sources, the Distribution Licensee may enter into additional agreement or arrangement for procurement of power.*
>
> *22.3 Any variation, during the first or second block of six months of a Year, in the quantum or cost of power procured, including from a source other than a previously approved source, that is expected to be in excess of five per cent of that approved bythe Commission, shall require its prior approval:*
>
> *Provided that the five per cent limit shall not apply to variation in the cost of power procured on account of changes in the price of fuel for own generation or the fixed or variable cost of power purchase that is allowed to be recovered in accordance with Regulation 10."*

Thus, in cases where there is an anticipated shortfall in fulfilling the demand and to optimise the power purchase cost, licensee can procure additional power subject to the variation of excess of five percent in the quantum or cost of power procured during the first or second block of six months of a Year from the sources other than approved by the Commission.

9.2. Further Ministry of Power's Guidelines dated 30 March 2016 notified under Section 63 of the Electricity Act 2003 for short-term procurement of power by Distribution Licensees through tariff-based bidding process stipulate as follows:

"11.4 If the quantum of power procured and tariff determined are within the blanket approval granted by the Appropriate Commission in Annual Revenue Requirement (ARR) of the respective year, then the same will be considered to have been adopted by the Appropriate Commission.

In all other cases, the Procurer(s) shall submit a petition to the Appropriate Commission for adoption of tariff within 2 days from the date of signing of PPA. Appropriate Commission should communicate the decision within 7 days from the date of submission of petition."

Thus, if the quantum of power procured and the tariff determined are not within the blanket approval specified by the Commission in ARR/ Tariff Order, Distribution Licensee needs to approach the Commission for approval of the additional power procurement and to adopt the tariff discovered through competitive bidding process.

9.3. In present case, the Commission notes that, it has approved following source wise power procurement quantum for FY 2022-23 to BEST under MYT Order dated 30 March 2020:

Source	TPC-G	Walwhan Solar	Manikaran	Solar Energy	Non-Solar Energy	Total
Quantum (MU)	3510.94	31.50	744.60	307.74	500.37	5095.15

Clearly, power procurement from Short Term Sources is not approved in Tariff Order. Hence, proposed short term power procurement needs to be treated as new source. Further, the Commission has indicated tariff for short term power procurement as Rs. 5.12 per unit for FY 2022-23. Tariff for proposed short term power procurement in present Petition is more than said tariff indicated in Tariff Order.

9.4. As the source of power is different and the tariff is higher than that has been approved by the Commission in MYT Tariff Order, it fulfils the criteria specified in MYT Regulations, 2019 and in the MoP Guidelines dated 30 March, 2016. Hence, prior approval of the Commission is required for proposed short term power procurement by BEST.

10. Issue B: - Whether the quantum of additional short-term power procurement proposed by BEST is justified?

10.1. The Commission notes that BEST has arrived at its demand projection based on average demand for last three years. Comparison of pre-pandemic demand and BEST's demand projection at T<>D periphery in MW is as below:

Month/ Year	Pre-pandemic				Actual	Projected
	2017	2018	2019	Average	2021	2022
Jan	650.0	706.6	635.6	664.1	628.1	
Feb	731.1	752.5	663.9	715.8	637.6	
March	845.8	832.4	794.4	824.2	722.5	

April	858.4	896.8	862.3	872.5	692.2	
May	916.4	911.5	872.7	900.2	655.0	
June	916.9	938.8	927.4	927.7	684.7	
July	816.9	789.0	812.4	806.1	716.3	
Aug	808.6	785.2	798.6	797.5	695.6	**797.0**
Sept	878.5	808.6	786.0	824.4	691.7	**784.0**
Oct	868.8	892.6	851.5	871.0	778.5	**861.0**
Nov	757.7	808.5	791.3	785.9	760.9	**785.0**
Dec	713.0	719.9	760.1	731.0	652.3	**713.0**

The Commission notes that BEST has relied upon average of past three years of 2017 to 2019 rather than actual demand recorded in 2021 for projecting demand for August to December 2022. In the opinion of the Commission as consumers demand has gradually reached pre-pandemic level, considering average demand corresponding to pre-pandemic period of 2017-2019 is appropriate approach to projecting demand for ensuing period.

10.2. Above projected demand at T< > D periphery is grossed up by intra-state transmission losses (3%) to arrive at T< > G level demand. The Commission further notes that BEST has submitted 15 minutes block wise demand supply projections for August to December 2022.

10.3. On supply side, BEST has considered the proposed plant shutdown as communicated by the generators. Further, BEST has envisaged that due to lower availability of APM gas, power availability from TPC-G's Unit 7 would be lower than its allocated share. Considering all these factors, BEST has worked out following supply shortfall for August to December 2022 and proposed to meet such shortfall through short term power procurement:

Time Slot	**Aug,22**	**Sept,22**	**Oct,22**	**Nov,22**	**Dec,22**
Estimated Peak demand (in MW)	823	810	889	811	736
Total availability (in MW)	728	728	728	728	636
Shortfall (in MW)	96	82	161	83	100
Proposed procurement					
00:00 to 24:00 Hrs, RTC (in MW)	-	-	50	-	-
10:00 to 18:00 Hrs (in MW)	50	50	-	-	-
10:00 to 19:00 Hrs (in MW)	-	-	100	80	100
Estimated total energy requirement (in Mus)	12.40	12.00	65.10	21.60	13.50
Total Mus	**124.60**				

10.4. The Commission also notes BEST's submission that even after such additional power procurement, total energy procurement in terms of 'MU' will be within the approved level in MYT Order. Although BEST has not provided specific reasons for the same, the Commission notes that this is due to non-availability of energy from RE sources as approved in tariff order. Such shortfall in renewable energy is required to be fulfilled by other sources. BEST has stated that it has entered into contract with SECI for 400 MW RE Hybrid project and is also envisaging additional RE procurement from SECI, but power flow from these projects will not be available during FY 2022-23 (up to December 2022) and hence, BEST needs to fulfill this gap from other sources.

10.5. The Commission also notes that BEST has opted for short term bilateral contract only in few months of last three years but was regularly drawing power from power exchanges in almost every month of last three years. However, due to increased demand in power market, even at cap rate, there is no surety of clearing of the bid quantum and hence for ensuring reliable power supply, BEST has proposed to enter short term power procurement contracts for August to December 2022.

10.6. The Commission notes that proposed short term power procurement is within the total power procurement quantum approved in tariff Order. Further, such short-term power procurement (12 to 65 MU per month) will replace some part of power being procured from power exchanges (164 to 300 MU) and hence the issue of transmission constraints will not arise.

10.7. Considering above, the Commission notes that quantum of short-term power proposed by BEST for the month of August to December 2022 is justified.

11. **Issue C: - Whether the discovered tariff is consistent with the market trend?**

11.1 The Commission notes that BEST has undertaken the short term power procurement as per the competitive guidelines of MoP dated 30 March, 2016 by floating the bid on DEEPportal on 27 June, 2022 for supply of 50 to 150 MW for various time slots for the period from August, 2022 to December, 2022. The weighted average tariff discovered is bidding process is Rs 7.72 per kWh.

11.2 In order to assess the competitiveness of the tariff discovered by BEST in the present bidding the Commission has referred to recent discovered tariff on DEEP Portal by other Distribution Licensees in Maharashtra and same is tabulated below:

Sr No	Particulars	Period	Availability	Quantum of Power in MW	Discovered tariff in Rs/ kWh
1	MSEDCL	1.10.2022 to 15.10.2022	24:00	100	8.82
		16.10.2022 to 31.10.2022	24:00	275	8.68
		1.11.2022 to 15.11.2022	24:00	375	8.68
		1.3.2023 to 15.03.2023	24:00	200	8.82
		16.03.2023 to 31.03.2023	24:00	200	8.82
		1.4.2023 to 15.04.2023	24:00	200	9.03
		16.04.2023 to 30.04.2023	24:00	200	9.03
		1.5.2023 to 15.05.2023	24:00	200	9.34
		16.05.2023 to 31.05.2023	24:00	200	9.34
		1.6.2023 to 15.06.2023	24;00	350	8.75
		1.6.2023 to 15.06.2023	24:00	100	9.34
2	TPC-D	01.08.2022 to 31.08.2022	24:00	45	9.09
		1.9.2022 to 30.09.2022	24:00	70	8.98
		1.10.2022 to 31.10.2022	24:00	50	8.99
		1.10.2022 to 31.10.2022	24:00	25	10.49
		1.10.2022 to 31.10.2022	24;00	25	12

From the above it is observed that the discovered tariff is consistent with the currentmarket trend.

11.3 The Commission notes that BEST has carried out the process of procurement of Short- Term Power in accordance with Competitive Bidding Guidelines and tariff discovered isreflective of current market situations.

11.4 Section 63 of the EA, 2003 mandates the Commission to adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.

11.5 In view of the foregoing, the Commission notes that tariff discovered by BEST fulfils mandates and requirements for adoption as set out in Section 63 of the EA, 2003 and MYT Regulations, 2019. Accordingly, the Commission adopts Power Procurement with weighted average tariff of Rs 7.72 /kWh and quantum for BEST undertaking for the period from August, 2022 to December, 2022 as follows:

Sr No	Contract Period From - To	Slot/Time (Hrs.)	Bid Quantum in MW	Successful Bidder	Source	Rate in Rs./ kWh	Allotted Quantum in MW
1	01-Aug-22 to 31-Aug-22	10:00 to 18:00	50	Tata Power Trading Co. Ltd (TPTCL)	Prayagraj Power Generation Co. Ltd. (PPGCL)	5.85	20
				Adani Enterprises Ltd	Raipur Energen Ltd. (REL)	5.86	30
2	01-Sep-22 to 30-Sept-22	10:00 to 18:00	50	TPTCL	PPGCL	7.50	20
				TPTCL	Jindal Power Ltd (JPL)	7.68	30
3	01-Oct-22 to 31-Oct-22	00:00 to 24:00 (RTC)	50	TPTCL	Jindal India Thermal Power Ltd. (JITPL)	8.66	25
				Manikaran Power Ltd. (MPL)	BLA Power Pvt Ltd.	8.66	25
4	01-Oct-22 to 31-Oct-22	10:00 to 19:00	100	TPTCL	PPGCL	7.50	20
				TPTCL	JPL	7.68	80
5	01-Nov-22 to 30-Nov-22	10:00 to 19:00	80	TPTCL	PPGCL	7.29	20
				MPL	BLA Power Pvt Ltd	7.30	25
				TPTCL	JPL	7.68	35
6	01-Dec-22 to 15-Dec-22	10:00 to 19:00	100	TPTCL	PPGCL	7.29	20
				MPL	BLA Power Pvt. Ltd.	7.30	25
				TPTCL	JPL	7.68	55

11.6The Commission also notes that LOA initialed with the successful bidders are in line with the Standard Bidding documents issued by MoP. Based on these submissions, the Commission approves the draft PPAs to be signed with above successful bidders at the tariff and for thequantum mentioned in above table in Para 11.5. BEST shall submit copies of final PPAs for records of the Commission.

11.7 BEST has also requested to consider Rs. 8.00/kWh as ceiling tariff for all future short term power procurement. However, as average tariff of Rs. 7.72/kWh is discovered through competitive bidding in present process, same shall act as ceiling tariff for procurement of short-term power through competitive bidding process for FY 2022-23. Any tariff discovered below such ceiling shall be considered as deemed adopted as per provisions of competitive bidding guidelines notified by the Central Government for short-term power procurement.

11.8 Having approved short-term power procurement as above, it is important to note that such short-term power procurement at average tariff of Rs. 7.72/kWh is against RE power approved in the Tariff Order at the tariff of Rs. 2.87 – 2.90/kWh and hence there would be increase in power purchase expenses which will have to be passed on to consumers as per Fuel Adjustment Charge mechanism stipulated in MYT Regulations and subsequent guidelines issued by the Commission in that respect.

12. Hence, following Order:

ORDER

1. **Case No. 151 of 2022 is partly allowed.**
2. **Short TermPower Procurement for the period from August, 2022 to December, 2022 by as Brihanmumbai Electric Supply and Transport Undertaking as stated in para 11.5 above is approved.**
3. **Brihanmumbai Electric Supply and Transport Undertaking, to submit copies of Final PPAs to the Commission for records.**

Sd/-	Sd/-	Sd/-
(Mukesh Khullar)	**(I.M. Bohari)**	**(Sanjay Kumar)**
Member	**Member**	**Chairperson**

(Abhijit Deshpande)
Secretary

Free Press Journal
30/1/2023

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The Brihanmumbai Electric Supply & Transport Undertaking
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

BEST BEST

NOTICE INVITING E-TENDER

Brihanmumbai Electric Supply & Transport Undertaking (BEST) invites bids for purchase of power on short term basis for the month from April, 2023 to March, 2024 through National e-bidding process.

The bid document for participation can be downloaded through DEEP e-portal of **www.mstcecommerce.com** from **10:00 hrs of 30.01.2023.** Bids must be submitted online through this portal on or before **17:00 hrs of 06.02.2023.** Any corrigendum will be published on the referred website only.

General Manager
BEST Undertaking

PRO/DEPM/162/2023

Business Standard
30/1/2023

The Brihanmumbai Electric Supply & Transport Undertaking
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

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General Manager
BEST Undertaking

PRO/DEPM/162/2023

THE BRIHANMUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING
(OF THE BRIHANMUMBAI MAHANAGAR PALIKA)

Tender No: BEST/Short/22-23/ET/247
&
BEST/Short/22-23/RA/237

Bid Document
For
Purchase of Short-term Bilateral Power
Through
E-Tendering and E-Reverse Auction Basis

By

Brihanmumbai Electric Supply & Transport Undertaking

Date: 30.01.2023

INVITATION FOR e-TENDER

Sr. No.	Event	Date/Time
1.	Publication of Bid Document/ Activation of Event	**30.01.2023 at 10:00 hrs.**
2.	Last date of submission of Bids including EMD	**06.02.2023 at 17:00 hrs.**
3.	Opening of Non-financial Technical Bids	**07.02.2023 at 10:00 hrs**
4.	Opening of IPOs	**09.02.2023 at 10:00 hrs**
5.	Start of e-Reverse Auction	**09.02.2023 at 12:00 hrs**

Bids to be submitted through	**DEEP e-bidding portal at www.mstcecommerce.com**
Office inviting Bids and place of submission of EMD	**Divisional Engineer, Power Management Department, BEST Undertaking, 1st Floor, Multi-storied Building Annex. BEST Marg, Colaba, Mumbai-400001 Tel:- 022-22799555 e-mail:- depower@bestundertaking.com**

1. INTRODUCTION AND BACKGROUND:-

Brihanmumbai Electric Supply & Transport Undertaking, here in after referred to as the **“BEST”**, a Distribution Licensee supplying electricity in the Mumbai City is inviting bids for procurement of power under Short Term arrangement for the month of April, 2023 to March, 2024 to meet its demand as per Terms and Conditions of this Bid Document (**Annexure-I**).

Bids are invited from various Trading licensees / Generators / State Utilities / CPPs / Distribution licensees / SEBs for purchase of power. The power would be procured in line with" Guide lines for short-term (i.e. for a period of more than one day to one year) Procurement of Power by Distribution Licensees through Tariff based bidding process" issued by Government of India - Ministry of Power under Section 63 of the Electricity Act, 2003 and as amended from time to time. The responsibility of the Successful Bidder(s) would be to supply power to BEST as per the Terms and Conditions of the Bid Document.

All the interested Bidders shall participate in the bidding process by downloading Bid Document from DEEP e-bidding Portal. The link of e-bidding Portal is **www.mstcecommerce.com**. Bidder needs to register on the e-bidding portal on MSTC website.

2. E-bidding FEE:-

All the Bidders would be able to participate in the e-bidding events on making payment of the requisite fees of Rs.500 per MW per requisition for the total capacity sought for that particular requisition for which a Bidder is willing to bid to PFC Consulting Limited (PFCCL). The requisite fee plus applicable taxes shall be deposited through the portal by e-Payment Gateway provided by MSTC Ltd. After the completion of the bidding process, only successful Bidder(s) will have to pay these charges for the quantum allocated to each Bidder. The balance amount will be refunded by PFCCL within seven (7) working days without any interest. The fee deposited by non-selected Bidder(s) will also be refunded by PFCCL within seven (7) working days of completion of the event without any interest.

3. Quantum of Power:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement for the month of April, 2023 to March, 2024 from various sources. The Bidder(s) shall supply power as mentioned below to BEST:

Requisition No.	Contract Period		Slot/ Time (Hrs.)			Quantum (in MW)	Minimum Bid Quantity (in MW)	Delivery Point
	From	To	From		To			
1.	01-Apr-23	30-Apr-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
2.	01-Apr-23	30-Apr-23	09:00	To	18:00	75	20	Maharashtra STU Periphery
3.	01-May-23	31-May-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
4.	01-May-23	31-May-23	09:00	To	18:00	100	20	Maharashtra STU Periphery
5.	01-Jun-23	30-Jun-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
6.	01-Jun-23	30-Jun-23	09:00	To	18:00	75	20	Maharashtra STU Periphery
7.	01-Jul-23	31-Jul-23	09:00	To	18:00	40	20	Maharashtra STU Periphery
8.	01-Aug-23	31-Aug-23	09:00	To	18:00	50	20	Maharashtra STU Periphery
9.	01-Sept-23	30-Sept-23	09:00	To	18:00	50	20	Maharashtra STU Periphery
10.	01-Oct-23	31-Oct-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
11.	01-Oct-23	31-Oct-23	09:00	To	18:00	100	20	Maharashtra STU Periphery
12.	01-Nov-23	30-Nov-23	09:00	To	18:00	40	20	Maharashtra STU Periphery
13.	01-Dec-23	31-Dec-23	09:00	To	18:00	75	20	Maharashtra STU Periphery
14.	01-Feb-24	29-Feb-24	09:00	To	18:00	50	20	Maharashtra STU Periphery

15.	01-Mar-24	31-Mar-24	09:00	To	18:00	50	20	Maharashtra STU Periphery

The Bidder(s) should be capable to supply power to BEST during the contracted period at the delivery point, for which the responsibility will be of the Bidder(s). Bidder/s shall ensure necessary infrastructure/ground work in this regard, while participating in the Bid.

4. Qualification Criteria:-

a. All the Generators/State Utilities /CPPs /Distribution Licensees /SEBs and trading licensees having valid trading license from Appropriate Commission are qualified to participate in the bidding process.

b. The Bidder must quote not less than Minimum Bid Quantity, as mentioned in the table above, from single source of generation.

c. If Bidder being an electricity trading licensee, then the trader(s) should submit a valid license from CERC/SERC for Inter-state /Intra-state trading of electricity. The trader shall also attach a photocopy of the same along with the Bid.

5. Submission of Bid:-

The Bidders shall submit their Bids on-line, through DEEP e-bidding portal only.

A) Non-Financial Bid Comprising of:

a) Acceptance to Terms and Conditions of Bid document (**Annexure-II**).

b) Bid Security (EMD) in the form of Bank Guarantee issued by any Nationalized/Scheduled Bank.

c) Source from which Bidder shall supply power shall be mentioned.

d) In case Bidder is Trader, scanned copy of valid Trading license from appropriate Commission should also be provided.

e) Copy of the authorization received from the Generator (in case of trader).

f) Board resolution/Authorization for signing the Bid document.

B) Financial Bid:-

Bidders shall be required to submit separate Non-Financial Technical Bids and Financial Bids i.e. Initial Price Offer (IPO) as per the following time-table:-

Event	Date and time
Date of publication of Bid document / Activation of Event	**30.01.2023 at 10:00 hrs.**
Submission of Bid (online Digitally signed Non-Financial Technical bid & IPOs)	**06.02.2023 at 17:00 hrs.**
Opening of Non-Financial Technical Bids	**07.02.2023 at 10:00 hrs**
Clarification, if any, sought from bidders	**08.02.2023 at 17:00 hrs**
Opening of IPOs	**09.02.2023 at 10:00 hrs**
Start of e-Reverse Auction	**09.02.2023 at 12:00 hrs**
Submission of Application for Open Access	**As per Open Access procedure/regulations**
Approval and Obtaining SLDC consent by the seller/purchaser.	

Note: BEST may extend the timelines of Bid with intimation to all Bidders through DEEP e-bidding portal only.

The Bidders are required to upload scanned copy of the EMD along with the Bid and the original copy of EMD to be sent so as to reach the address as given below on or before **17:00 hrs of 06.02.2023**:

Divisional Engineer,
Power Management Department,
BEST Undertaking,
1st Floor, Multi-storied Building Annex.
BEST Marg, Colaba,
Mumbai-400001.
Tel:- 022-22799555

6. BIDDING PROCESS:-

a. The Bidder shall use one Digital Signature to submit bid through one login and for each e-bidding event shall comprise of two parts i.e. e-Tender and e-Reverse Auction. An event may have multiple requisitions (i.e. independent requirements of power at different time or places). To participate in the event, each Bidder will have to specify the source of power for that particular bid. Each bid will have only one price per requisition accompanied by the total quantum of power the Bidder intends to supply and minimum threshold quantum acceptable to the Bidder. However, the Bidder shall have the option to choose the requisition of an event in which it intends to participate. Each of the Bids will have to be signed by the Digital signature of the Bidder.

b. Each login the bidder may submit only one price bid from one source. However, against each requisition the Bidder have the option to bid multiple bids from separate login either from same or different sources.

c. The Bidder shall quote the single tariff at delivery point up to three (3) decimals which shall include capacity charge, energy charge, trading margin (in case of Bidder being a Trader) and all taxes, duties, cess, levies etc. Open Access charges up to and beyond the delivery point shall be borne by the Bidder. The price quoted shall not change in case if any tax/ duty/ levy/cess/charges become applicable after the submission of Bids. The tariff should be constant and there shall be no escalation during the contractual period.

d. Each event of the auction would require independent Digital Signature of the Bidder.

e. Bidders shall be required to submit separate Non-Financial Technical Bid and Financial Bids i.e. Initial Price Offer (IPO) through e-bidding portal.

f. The Bidders can revise their IPOs before date and time of submission of Bid Document.

g. After acceptance of the Non-Financial Technical Bids, the Financial Bids shall be opened as per schedule given in event time table.

h. In the event, if two or more Bidders quote the same amount of Tariff during IPO and e-Reverse Auction stage, the time of submission of Bid will be the deciding factor for their ranking.

i. The elimination of the Bidders shall be done by the following method:

1) After the opening of Initial Price Offers, the system will rank the Bidders according to their price bids. The Bidder with the highest price bid in IPO stage will be called the H1 Bidder. The system will then analyze all the quantities offered by the Bidders in the IPO stage. If the total quoted quantity is greater than twice the Requisitioned Quantity, the Highest Bidder (H1) will be eliminated provided that the total quoted quantity after elimination is not less than or equal to twice the Requisitioned Quantity.

2) The Elimination process will be done for each of the requisition separately.

3) The shortlisted Bidder after elimination will be intimated individually by system generated emails only.

j. The Reverse auction will start within 120 minutes of opening of Initial Price Offers and shall continue for a period of next 120 minutes.

k. Provided that during the last 10 (ten) minutes before the scheduled close time of e-Reverse auction, if a price bid is received which is lower than the lowest prevailing price bid recorded in the system during e-Reverse auction, the close time of e- Reverse auction will be automatically extended by 10 (ten) minutes from the time of the last price bid received. This process of auto-extension will continue till there is a period of 10 (ten) minutes during which no price bid are received which is lower than the prevailing lowest price bid.

l. During the Reverse Auction the Bidders will have the option of reducing the tariff quoted by them in decrements of one paisa or multiples thereof and to increase the quantum quoted by them by 1 MW or multiples thereof. During the Reverse Auction the prevailing Lowest Tariff would be visible to all the Bidders.

m. The Bidders will have the option to increase the quantum of power upto corresponding to the value of EMD submitted along with IPO, but decrease the Tariff during the e-Reverse Auction process.

7. **Contract Documents:-**

BEST shall intimate to Bidder(s) regarding award of contract for supply of power (whose Bid has been accepted) through a Letter of Intent (LoI).

8. **Compliance to the Terms & Conditions:-**

The Bidders are advised to ensure that the Bid is fully compliant with the requirements specified and Terms and Conditions contained in the Bid Document. No deviation from these conditions is permissible and a Bid with any deviation shall be summarily rejected.

9. **Earnest Money Deposit (EMD):-**

a. The Bidder shall be required to submit EMD of Rs. 30,000 per MW per month (for 30 days, 24 hours and same shall be reduced on pro-rata basis) of offered capacity in the form of Bank Guarantee (Format Enclosed-**Annexure-III**) issued by any Nationalized/Scheduled Bank in favour of "The General Manager, Brihanmumbai Electric Supply & Transport Undertaking" payable at Mumbai, **valid till 15.03.2023**.

Example: For a requirement of 2 MW for 15 days for 4 hours, the EMD shall be = Rs. 30,000 x 2 MW x (15 days/30 days) x (4 hrs/24 hrs) = Rs. 5000/-

All costs/expenses/charges associated with the bidding, including bank guarantee etc. shall be borne by the Bidder. The validity of the EMD shall be extended by the Bidder if required by BEST.

BEST's bank details are as follows:

Name: BEST Undertaking

Account No.: 0106261008935

Name of Bank: Canara Bank

Branch name: Colaba

IFSC Code: CNRB0000106

b. The EMD shall be forfeited,

- If Bidder withdraws or modifies bid during Bid Validity Period.

- If Bidder fails to supply power after issue of Letter of Intent (LoI).
- Bidder failure in performing its contractual obligations.
- For Non submission of Contract Performance Guarantee by successful bidder.

c. The EMD of successful Bidder shall be released after submission of Contract Performance Guarantee as per Clause No. 10 below.

d. The EMD of unsuccessful bidder shall be released within 15 days from date of expiry of Bid validity period.

e. If it is observed that EMD of Bidder(s) has not been submitted or is less than the specified amount, the bid shall be rejected and Financial Bid submitted by such a Bidder shall not be opened.

No interest shall be paid on the Earnest Money Deposit.

10. Contract Performance Guarantee (CPG):-

a. Successful bidders are required to produce CPG within 7 days from date of Issue of Letter of Intent (LoI) to successful bidder for an amount of Rs 2 Lac per MW per Month (for 30 days, 24 hours) of contract period or part thereof. The CPG for the procurement of power on hourly basis shall be calculated on pro-rata basis as per the example given above for calculating EMD.

b. CPG to be issued by Nationalized/ Scheduled bank and valid for the period of contract and 1 month post expiry of contract. All costs/expenses/charges associated with CPG shall be borne by the Bidder. Refer Clause 9 above for BEST's bank details.

c. In case of CPG submission delay within stipulated period, Bid security i.e. EMD shall be forfeited.

d. CPG to be released after 30 days of completion of contract period.

e. The CPG provided by the successful bidder shall be forfeited for not performing the contractual obligations.

11. BEST’s right- Acceptance/Rejection of Bid:-

This Bid document may be withdrawn or cancelled by BEST at any time without assigning any reasons thereof. BEST further reserves the right, at its complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account. The entire bidding process is subject to approval of Maharashtra Electricity Regulatory Commission.

12. Modification of the Bid Document:-

BEST reserves the right to modify any part of the Bid Document by issuing one or more amendments prior to the last date of submission of the Bid ("Amendment").

Any Amendment shall form part of the Bid Document, and shall be binding on bidders.

Any corrigendum/ clarifications with the Bid document and/or the Bidding process shall be published on the DEEP e-bidding portal only.

13. Bid Validity Period:-

The validity period of offer of Bidder shall be till **15.03.2023.**

14. Governing Law:-

All matters arising out of or in conjunction with the Bid Document and/or the bidding process shall be governed by and construed in accordance with Indian Law and the courts of Mumbai, Maharashtra shall have exclusive jurisdiction.

15. Condition Precedent:-

The Award of Contract i.e. Letter of Intent (LoI) is subject to approval, clearances, and permissions from all authorities i.e. Maharashtra State Electricity Regulatory Commission, RLDC / SLDCs etc.

16. Disclaimer:-

Neither BEST nor its employees or consultants shall be liable to any Bidder or any other person under any law including the law of contract, tort, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage which may arise, or be incurred, or suffered, in connection with the Bid, or any matter that may be deemed to form part of the Bid document or any other information supplied by or on behalf of BEST or its employees or consultants. For the avoidance of doubt it is expressly clarified that this Bid Document is an offer to Bid and is subject to the award of Letter of Intent (LoI) by BEST.

****

<u>Annexure-I</u>

General Terms and Conditions

1. Quantum:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement. The Bidder(s) shall supply power as mentioned below to BEST:

Requisition No.	Contract Period		Slot/ Time (Hrs.)			Quantum (in MW)	Minimum Bid Quantity (in MW)	Delivery Point
	From	To	From		To			
1.	01-Apr-23	30-Apr-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
2.	01-Apr-23	30-Apr-23	09:00	To	18:00	75	20	Maharashtra STU Periphery
3.	01-May-23	31-May-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
4.	01-May-23	31-May-23	09:00	To	18:00	100	20	Maharashtra STU Periphery
5.	01-Jun-23	30-Jun-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
6.	01-Jun-23	30-Jun-23	09:00	To	18:00	75	20	Maharashtra STU Periphery
7.	01-Jul-23	31-Jul-23	09:00	To	18:00	40	20	Maharashtra STU Periphery
8.	01-Aug-23	31-Aug-23	09:00	To	18:00	50	20	Maharashtra STU Periphery
9.	01-Sept-23	30-Sept-23	09:00	To	18:00	50	20	Maharashtra STU Periphery
10.	01-Oct-23	31-Oct-23	00:00	To	24:00	50	20	Maharashtra STU Periphery
11.	01-Oct-23	31-Oct-23	09:00	To	18:00	100	20	Maharashtra STU Periphery

12.	01-Nov-23	30-Nov-23	09:00	To	18:00	40	20	Maharashtra STU Periphery
13.	01-Dec-23	31-Dec-23	09:00	To	18:00	75	20	Maharashtra STU Periphery
14.	01-Feb-24	29-Feb-24	09:00	To	18:00	50	20	Maharashtra STU Periphery
15.	01-Mar-24	31-Mar-24	09:00	To	18:00	50	20	Maharashtra STU Periphery

2. Delivery Point:-

The Interface of Transmission network of Maharashtra State (i.e. Maharashtra STU Periphery).

3. Open Access Charges, transmission Losses and other Charges:-

All Open Access charges i.e. Transmission charges & losses, POC injection /withdrawal charges and losses, reliability support charges, Scheduling & operating charges of RLDC/SLDC, RLDC application fee or any other charges/fees upto delivery point shall be borne by the Bidder. The Open Access charges beyond delivery point (i.e. Maharashtra State Scheduling charges and Application charges) shall also be borne by the Bidder. Any revision in these charges if become applicable after the submission of Bids shall be on account of the Bidder.

BEST is a Long-Term Transmission System user of Maharashtra State. Hence, Maharashtra State transmission (InSTS) charges and losses are not applicable. Therefore, bidders while quoting need not factor Maharashtra State Transmission charges and Losses.

BEST does not have any Interstate LTOA/MTOA contract. Same may be factor into while quoting tariff and during application for Open Access.

If the power is being supplied through alternate source, additional charges and losses if any, due to cancellation of existing corridor and booking of new corridor etc., shall be to the account of the Bidder.

In case of reduction or cancellation of open access schedule, the defaulting party will bear all open access charges thereof in accordance with MERC (Transmission Open Access) Regulations, 2016 / procedure for Scheduling of bilateral transaction by CTU dated 28.01.2008 and subsequent amendments from time to time.

4. Open Access and Scheduling:-

After receipt of Letter of Intent (LoI) for supply of power, the Bidder has to apply for booking of transmission corridor for full contracted quantum for contracted period of supply for which is issued and acknowledge the acceptance of the same. Any revision in contracted quantum by the Supplier will not be accepted. There will be no liability on payment for BEST to pay the excess energy supplied by the Supplier on its own accord.

The Bidder shall book for open access on firm basis upto delivery point in accordance with procedure of bilateral transaction based on CERC's Open Access Regulations, 2008/ MERC (Transmission Open Access) Regulations, 2016 with amendments from time to time. Any liability on account of open access or any clarification on open access upto and beyond the delivery point will not come under purview of BEST.

BEST shall have the right to surrender/cancel open access at any time due to any unforeseen circumstances. Bidder shall have to respond immediately on request from BEST and arrange to surrender/cancel open access.

Both BEST and the Bidder shall schedule this power in full except in case of Force Majeure. The scheduling and dispatch of the power shall be coordinated with respective RLDCs/SLDCs as per the relevant provisions of IEGC/State Grid Code Regulations, 2020, frame work of MERC's Deviation Settlement Mechanism (DSM) and decisions of RLDCs, SLDCs and RPCs.

Final Energy accounting shall be as per the REA/SEA issued by the concerned RLDC/RPC/SLDC.

5. Tariff:-

Bidder shall quote firm price (Rs./kWh) at delivery point for each contracted period mentioned in the bid document and shall be inclusive of capacity charges, variable charges, trading margin, all taxes, duties, levy, cess etc. imposed by Central/State governments / Statutory authorities, etc..

The Tariff shall not change during contractual period if any tax / duty / levy / cess / charges / fees become applicable after the submission of bids.

Bidder shall quote the single tariff at delivery point up to three decimals.

In case Bidder being trader, should ensure that trading margin charged should be as per norm of appropriate regulatory commission.

6. Supply from alternative sources:-

In case of failure of the generation source, Bidder shall have to supply power from alternative source(s) with intimation to BEST. The supply from the alternative source(s), if any, would be made at the same tariff at which supplier has contracted power with BEST. Any additional liability in supply of power from alternative source(s) shall be borne by the Bidder.

7. Billing Cycle:-

Bidder(s) shall raise Provisional weekly energy bills based on daily schedule issued by Maharashtra SLDC / WRLDC. The blockwise energy schedules shall be rounded off to nearest second decimal point. The Final bill to be issued based on the REA published by the WRPC for Inter-state power and SEA based on DSM issued by MSLDC for Intra-state power. After receipt of REA of WRPC/ SEA statement of MSLDC, Final bill shall be raised by the Bidder for necessary adjustments.

8. Payment:-

Energy Bill:

BEST shall make payment to Bidder(s) in Bidder(s) bank account by RTGS within thirty (30) days from the receipt of correct bill, which will be the due date.

BEST will be eligible for prompt payment rebate @ 2% on energy bill amount, if the payment is made within seven (7) days (Excluding Sundays and Bank holidays) from the receipt of correct energy bill, through email/courier.

Compensation Bill:-

For any Compensation payable by BEST/Bidder, invoice shall be raised by Bidder/BEST as the case may be and payment shall be made within 30 days from the date of receipt of correct bill.

In case the due date falls on Sunday/ Bank holiday, then the next working day would be considered as due date. This is applicable to all above referred Bills.

Surcharge on delayed payment (if any) for all above Bills shall be as follows:

1.25% per month on all outstanding payments after the 30th day from the date of receipt of correct bill. The surcharge shall be calculated on a day-to-day basis for each day of the delay after due date.

9. Compensation Clause for failure to Supply/ Off-take the Quoted capacity:-

Both the parties would ensure that actual scheduling does not deviate by more than 15% of the contracted power as per the approved open access on monthly basis or actual period (if period is less than a month) during Contracted period.

Without prejudice to provision of force majeure, if Bidder fails to supply contracted quantum of energy as per approved open access on monthly basis in the Contracted period, Bidder shall pay compensation to BEST @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15 % in the Contracted period.

In case BEST defaults in off take of contracted quantum of energy as per approved open access on monthly basis in the Contracted period, BEST shall pay to Bidder @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15% in the Contracted period.

Allowable reduction in quantum of power, if required, shall be uniformly spread over the month as far as possible.

Compensation on account of shortfall in supply/Off-take will be settled separately on monthly basis and either party shall raise invoice to claim compensation. For any Compensation payable by BEST/Bidder as above, invoice shall be raised by Bidder/BEST as the case may be within 1st week after completion of the month and payment shall be made within 30 days from the date of receipt of invoice.

Bidder must apply for Open access for full contracted capacity. If the Bidder does not apply for open access for full quantity, then this would be treated as default in supply of power by the Bidder and compensation provision will apply.

In case the Bidder/Seller fails to offer the contracted power as per the Agreement to BEST and sells this power without BEST's consent to any other party, BEST shall be entitled to claim damages from the Bidder/Seller for an amount equal to the higher of : (a) twice the Tariff as per the PPA for the corresponding contracted power ; and (b) the entire sale revenue accrued from Third Parties on account of sale of this contracted power. These damages shall be in addition to Compensation as mentioned above, for failure to supply the contracted capacity.

Further a complaint to this effect will be made by BEST to the concerned load dispatch centre. The Bidder/Seller shall be debarred from participating in power exchanges and also from scheduling of this power in any short term/ medium term / long term contracts from that generating station for a period of three months from the establishment of default, in the complaint. The period of debarment shall increase to six months for second default and shall be one year for each successive default.

10. Force Majeure:

A "Force Majeure Event" shall mean any event or circumstance or combination of events or circumstances (not otherwise constituting an Indian political Event) that adversely affects, prevents or delays any party in the performance of its obligation in accordance with the terms of this Agreement, but only if and to the extent that (i) such events and circumstances are not within the reasonable control of the affected party, and (ii) such events or circumstances could not have been prevented through employment of Prudent Utility Practices.

Neither party shall be in breach of its obligations pursuant to this understanding to the extent that the performance of its obligation was prevented, hindered or delayed due to Force Majeure Event, and without in any way prejudicing the obligation of either Party to make payments of amounts accrued due prior to the occurrence of the event of Force Majeure, which shall be payable on the original Due Date.

Force Majeure Events shall mean the occurrence of any of the following events:-

a) Act of war, invasion, armed conflict, blockade, revolution, riot, insurrection or civil commotion, terrorism, sabotage, fire, explosion or criminal damage;
b) Act of God, including fire, lightning, cyclone, typhoon, flood, tidal wave, storm, earthquake, landslide, epidemic, pandemic or similar cataclysmic event;
c) Any curtailment/suspension/non-availability of transmission capacity by intervening SLDCs and/or RLDCs;
d) Any restriction imposed by any RLDCs;

e) Regulatory intervention in the matter of power trading as also orders from CERC/ SERCs/ Appellate Tribunal of Electricity/High Courts/ Supreme Court particularly related to rates at which power can be sold/ purchased/traded. This will also include regulations / orders already issued but yet to be conclusively enforced. Any directive by Government of Maharashtra not to export power outside Maharashtra state boundary.

11. Change in Law:-

Since the tender is invited for short term period at firm price, any variation in price due to any reasons what so ever, including change in Law, will not be applicable.

12. Details of the Bidder(s) (In case of the Bidder being a trading licensee):-

In case the Bidder is trading licensee, Agreement with the seller/generator shall be attached with the Bid.

13 Bid Validity:-

The validity period of offer of Bidder shall be till **15.03.2023.**

14 BEST's Rights:

BEST reserves its right to accept or reject any Offer whether fully or partially without assigning any reasons pursuant to this Bid. The Bidder on the other hand binds himself to sell power in part or whole at the option of the BEST.

15. Resolution of Dispute:-

Any dispute or differences arising under, out of, or in connection with this Bid document shall be subjected to exclusive jurisdiction of competent court at Mumbai only. In any event BEST shall not be responsible for any dispute between the Bidder (in case of bidder being the trading licensee) and the Generator.

16. Arbitration:

Subject to the statutory provisions for arbitration under the Electricity Act, 2003, all other differences or disputes between the parties arising out of or in connection with this Bid document shall be settled through Arbitration subject to the provisions of the Arbitration and Conciliation Act, 1996. The venue for Arbitration shall be at Mumbai.

Notwithstanding any legal dispute, disagreement or difference, the parties here to, continue to perform the respective obligations under the terms of this agreement.

17. Condition Precedent:-

The Letter of Intent (LoI) is subject to approval, clearances and permissions from all authorities i.e. Maharashtra Electricity Regulatory Commission (MERC), RLDC/ SLDCs.

18. Acceptance of Offer:-

BEST reserves the right to reject any or all the Bids without assigning any reasons what so ever. It is also not binding on BEST to disclose any analysis report on offers. Once the acceptance of the offer is conveyed, the Bidder(s) would be bound to supply the power as per the contract. BEST reserves the right to enter into Letter of Intent (LoI) with one or more of the Suppliers.

****

Annexure-II

To be given on the official letter head of the Bidder

Acceptance of Terms and Conditions of Bid Document
(To be signed by the authorized person of the bidder)

We/I have carefully gone through the Bid Document No. ……………..…….. dated…………and satisfied ourselves/myself and hereby confirm that our/my offer strictly conforms to the requirements of the Bid Document and all the terms and conditions are acceptable to us.

Signature :-

Name :-

Status :-

Whether Authorized Yes/No

Power of Attorney of Bidding Company
Authorizing the signatory to sign the bid

Name & Seal of Bidding Company

Format of Covering Letter

(The covering letter should be on letter head of bidding company/ lead member of the bidding consortium)

Date……………………..

From………………………… (Insert Name and address of bidding company)
…………………………
Tel No :-
Fax:-
Email address :

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

Sub: Bid for Purchase of power by BEST on short term Basis i.e. for the period from……….. to……….through e-Tender & e-Reverse Auction process in response to Bid Document No. ……………. dated ………..

Dear Sir,

We, the undersigned, ………..(insert name of the bidder) having read, examined and understood in detail the Bid document for purchase of power by BEST on short term basis i.e. for the period from……….. to……….through E-tendering process hereby submit our bid.

a. We give unconditional acceptance to the Bid Document No…..………………dated ……………(insert date), attached thereto, issued by the BEST.
In token of our acceptance to the Bid Document, the same have been initiated by us and enclosed to the bid. We shall ensure provisions of the Bid Document shall be binding on us.

b. EMD:
We have enclosed the EMD of Rs……………….(insert amount), in the form of Bank Guarantee dated …….. drawn on ………………(insert name of Bank) and payable at Mumbai.
The offered quantum of power by us is …………MW(insert total capacity offered).

c. We have submitted our financial bid strictly as per Bid Document without any deviations, conditions and without mentioning any assumptions or notes for the financial bid in the said format.

d. Acceptance:-
We hereby unconditionally and irrevocably agree and accept that the decision made by the BEST in respect of any matter regarding or arising out of the Bid shall be binding on us. We hereby expressly waive any and all claim in respect of Bid process.

We confirm that there are no litigations or disputes against us, which materially affect our ability to fulfill our obligations with regard to supply of power.

e. Contact person:
Details of contact person are furnished as under:
Name ………………………………
Designation………………………..
Company………………………….
Address…………………………….
Phone Nos …………………………
Fax Nos……………………………..
Email Address……………………….

f. It is confirm that our bid is consistent with all the requirements of submissions as stated in the Bid Document and subsequent communications from BEST.

g. The information submitted in our bid is complete, strictly as per the requirement stipulated in the Bid Document and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our bid.

h. We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of ………days from the bid deadline (i.e. till……..day of………2023).

i. We confirm that we have not taken any deviations so as to be deemed non responsive with respect to the provisions of this Bid Document.

Dated ……..day of………2023

Thanking You.

Your's Faithfully,

(name , designation and signature of authorized person in whose name power of attorney/Board Resolution is issued by the Bidder)

Annexure-III

DRAFT FORMAT OF THE BANK GURANTEE FOR EMD

(The Bank Guarantee should be executed on a non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution along with a Confirmatory Letter from the Regional office of the Bank concerned in enclosed format.)

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

In consideration of _______________ (name of Bidder to be inserted) agreeing to undertake the obligations under the terms and conditions of Bid Document No:_____________ dated______ signed by_________________________(name of bidder to be inserted) having its office at _________________ .The__________________ (Insert Guarantor Bank Name) having its registered office at ___________________ hereinafter referred to as "Guarantor Bank" hereby agrees unequivocally, irrevocably and unconditionally to pay to BEST Undertaking having its office at BEST Bhavan, BEST Marg, Mumbai-400001 forthwith on demand in writing from the General Manager, BEST Undertaking or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees____________ Only with respect to the offered Capacity of______MW as per the terms and conditions of the Bid Document No. _________________dated__________.

This guarantee shall be valid and binding on the Guarantor Bank upto and including______________________(Insert date of validity of EMD) and shall in no event not be terminable by notice or any change in the constitution of the Bank or the term of the Bid Document No._______________ dated_______ signed by__________ or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs.________________(Rs.__________/-) only. Our Guarantee shall remain in force until ______________. BEST Undertaking shall be entitled to invoke this Guarantee up to __________________, by issuance of a written demand to invoke this guarantee.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand from BEST Undertaking, made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to BEST Undertaking.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by__________ (name of Bidder to be inserted). The Guarantor Bank shall not require BEST Undertaking to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against the Procurer(s) in respect of any payment made hereunder.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring, liquidation, winding up, dissolution or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly BEST Undertaking shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against_________ (name of Bidder to be inserted)to make any claim against or any demand on the ___________ (name of Bidder to be inserted)or to give any notice to or to enforce any security held by BEST Undertaking or to exercise, levy or enforce any distress, diligence or other process against__________(name of Bidder to be inserted).

The Guarantor Bank acknowledges that this BANK GUARANTEE is not personal to BEST Undertaking and may be assigned, in whole or in part, (whether absolutely or by way of security) by BEST Undertaking to any entity to whom it is entitled to assign its rights and obligations under the Bid document.

The Guarantor Bank hereby agrees and acknowledges that BEST Undertaking shall have a right to invoke this Bank Guarantee either in part or in full, as it may deem fit.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs.______________ (Rs ___________/-) only and it shall remain in force until_______________.

This BANK GUARANTEE shall be extended from time to time for such period, as may be desired by______________ (name of Bidder to be inserted). We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if BEST Undertaking serves upon us a written claim or demand.

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Mumbai shall have exclusive jurisdiction.

In witness whereof the Bank, through its authorized officer, has set its hand and stamp on his____________ day of_____________ at___________.

Witness :-

(1) _______________________________ The Duly Constituted Attorney

(Signature)

_____________________________ _____________________________

(Name of the witness) (Signature)

______________________________ _____________________________

(Address of the witness) (Name & Designation of the person)

For ____________________________

(Name of the Bank)

(2) _______________________________

(Signature)

_______________________________ ______________________________

(Name of the witness) (Name of the Bidder)

____

(Address of the witness)

The Bank and the said Messrs.
Witness: _______________________________

____

(Signature)

____

(Name of the witness)

____

(Address of the witness)

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
1	1 (Maharashtra STU Periphery)	50.0(MW)	From 01.04.2023:00.00 to 30.04.2023:24.00	Mittal Processors Private Limited/75253	**25**	**7.85**	IPO 06/02/2023 15:37:17	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Mittal Processors Private Limited/75253	25	7.85	IPO				
2	2 (Maharashtra STU Periphery)	75.0(MW)	From 01.04.2023:09.00 to 30.04.2023:18.00					
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
3	3 (Maharashtra STU Periphery)	50.0(MW)	From 01.05.2023:00.00 to 31.05.2023:24.00	Mittal Processors Private Limited/75253	**25**	**7.85**	IPO 06/02/2023 15:37:17	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Mittal Processors Private Limited/75253	25	7.85	IPO				

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
4	4 (Maharashtra STU Periphery)	100.0(MW)	From 01.05.2023:09.00 to 31.05.2023:18.00					
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
5	5 (Maharashtra STU Periphery)	50.0(MW)	From 01.06.2023:00.00 to 30.06.2023:24.00	Mittal Processors Private Limited/75253	25	7.85	IPO 06/02/2023 15:37:17	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Mittal Processors Private Limited/75253	25	7.85	IPO				
6	6 (Maharashtra STU Periphery)	75.0(MW)	From 01.06.2023:09.00 to 30.06.2023:18.00					
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
7	7 (Maharashtra STU Periphery)	40.0(MW)	From 01.07.2023:09.00 to 31.07.2023:18.00	Manikaran Power Limited/78172	40	5.9	09/02/2023 16:25	Dhariwal Infrastructure Limited (Unit 1 with installed Capacity 300 MW) Chandrapur, Maharashtra
				Ideal Energy Projects Limited/308568	40	5.9	09/02/2023 16:25	IDEAL ENERGY PROJECTS LTD (IEPL), BELA, TAH-UMRED, DIST-NAGPUR (IPP)
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Ideal Energy Projects Limited/308568	40	5.9	RA				

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
8	8 (Maharashtra STU Periphery)	50.0(MW)	From 01.08.2023:09.00 to 31.08.2023:18.00	Ideal Energy Projects Limited/308568	50	6.24	09/02/2023 14:45	IDEAL ENERGY PROJECTS LTD (IEPL), BELA, TAH-UMRED, DIST-NAGPUR (IPP)
				Mittal Processors Private Limited/75253	25	6.25	09/02/2023 14:41	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
				Manikaran Power Limited/78172	50	6.45	09/02/2023 14:25	Dhariwal Infrastructure Limited (Unit 1 with installed Capacity 300 MW) Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Ideal Energy Projects Limited/308568	50	6.24	RA				
9	9 (Maharashtra STU Periphery)	50.0(MW)	From 01.09.2023:09.00 to 30.09.2023:18.00	Ideal Energy Projects Limited/308568	50	5.99	09/02/2023 15:20	IDEAL ENERGY PROJECTS LTD (IEPL), BELA, TAH-UMRED, DIST-NAGPUR (IPP)
				Mittal Processors Private Limited/75253	25	6	09/02/2023 15:18	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
				Manikaran Power Limited/78172	50	6.4	09/02/2023 14:25	Dhariwal Infrastructure Limited (Unit 1 with installed Capacity 300 MW) Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Ideal Energy Projects Limited/308568	50	5.99	RA				

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<tr><th>Sl.No.</th><th>Item Name</th><th>Quantity (UOM):</th><th>Description</th><th>Bidder Ref. No.</th><th>Booking Quantity</th><th>Booking Amount</th><th>Booking Time</th><th>Source of power / details of generating station from where power is intended to be supplied</th></tr>
<tr><td rowspan="2">10</td><td rowspan="2">10 (Maharashtra STU Periphery)</td><td rowspan="2">50.0(MW)</td><td rowspan="2">From 01.10.2023:00.00 to 31.10.2023:24.00</td><td>Tata Power Trading Company Limited/74174</td><td>25</td><td>7.84</td><td>09/02/2023 13:47</td><td>Jindal India Thermal Power Limited (JITPL)</td></tr>
<tr><td>Mittal Processors Private Limited/75253</td><td>25</td><td>7.84</td><td>09/02/2023 13:53</td><td>LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra</td></tr>
<tr><td colspan="5">Bucket Filling</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Sl.No.</td><td>Bidder Ref. No.</td><td>Quantity</td><td>Price</td><td>Event Type</td><td></td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>Tata Power Trading Company Limited/74174</td><td>25</td><td>7.84</td><td>RA</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Mittal Processors Private Limited/75253</td><td>25</td><td>7.84</td><td>RA</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="9"></td></tr>
<tr><td>11</td><td>11 (Maharashtra STU Periphery)</td><td>100.0(MW)</td><td>From 01.10.2023:09.00 to 31.10.2023:18.00</td><td>Manikaran Power Limited/78172</td><td>63</td><td>8.48</td><td>09/02/2023 13:53</td><td>Dhariwal Infrastructure Limited (Unit 1 with installed Capacity 300 MW) Chandrapur, Maharashtra</td></tr>
<tr><td colspan="5">Bucket Filling</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Sl.No.</td><td>Bidder Ref. No.</td><td>Quantity</td><td>Price</td><td>Event Type</td><td></td><td></td><td></td><td></td></tr>
<tr><td>1</td><td>Manikaran Power Limited/78172</td><td>63</td><td>8.48</td><td>RA</td><td></td><td></td><td></td><td></td></tr>
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Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
12	12 (Maharashtra STU Periphery)	40.0(MW)	From 01.11.2023:09.00 to 30.11.2023:18.00	Manikaran Power Limited/74144	**25**	**8**	09/02/2023 13:35	BLA Power Private Limited Unit-1, Village Niwari, PO Khursipar, Tehsil Gadarwara, Narsinghpur, Madhya Pradesh â·· 487551
				Mittal Processors Private Limited/75253	**25**	**6.94**	IPO 06/02/2023 15:37:17	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
				Manikaran Power Limited/78172	**20**	**8.49**	IPO 06/02/2023 15:41:23	Dhariwal Infrastructure Limited (Unit 1 with installed Capacity 300 MW) Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Mittal Processors Private Limited/75253	25	6.94	IPO				
2	Manikaran Power Limited/74144	15	8	RA				
13	13 (Maharashtra STU Periphery)	75.0(MW)	From 01.12.2023:09.00 to 31.12.2023:18.00	Manikaran Power Limited/74144	**25**	**8**	09/02/2023 13:36	BLA Power Private Limited Unit-1, Village Niwari, PO Khursipar, Tehsil Gadarwara, Narsinghpur, Madhya Pradesh â·· 487551
				Mittal Processors Private Limited/75253	**25**	**6.94**	IPO 06/02/2023 15:37:17	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Mittal Processors Private Limited/75253	25	6.94	IPO				
2	Manikaran Power Limited/74144	25	8	RA				

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
14	14 (Maharashtra STU Periphery)	50.0(MW)	From 01.02.2024:09.00 to 29.02.2024:18.00	Manikaran Power Limited/78172	**25**	**7.48**	09/02/2023 13:53	Dhariwal Infrastructure Limited (Unit 1 with installed Capacity 300 MW) Chandrapur, Maharashtra
				Manikaran Power Limited/74144	**25**	**8**	09/02/2023 13:36	BLA Power Private Limited Unit-1, Village Niwari, PO Khursipar, Tehsil Gadarwara, Narsinghpur, Madhya Pradesh â▪▪ 487551
				Mittal Processors Private Limited/75253	**25**	**6.94**	IPO 06/02/2023 15:37:17	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Mittal Processors Private Limited/75253	25	6.94	IPO				
2	Manikaran Power Limited/78172	25	7.48	RA				
15	15 (Maharashtra STU Periphery)	50.0(MW)	From 01.03.2024:09.00 to 31.03.2024:18.00	Manikaran Power Limited/78172	**25**	**7.99**	09/02/2023 13:57	Dhariwal Infrastructure Limited (Unit 1 with installed Capacity 300 MW) Chandrapur, Maharashtra
				Manikaran Power Limited/74144	**25**	**8**	09/02/2023 13:36	BLA Power Private Limited Unit-1, Village Niwari, PO Khursipar, Tehsil Gadarwara, Narsinghpur, Madhya Pradesh â▪▪ 487551
				Mittal Processors Private Limited/75253	**25**	**6.94**	IPO 06/02/2023 15:37:17	LLOYDS METALS & ENERGY LTD., Chandrapur, Maharashtra
Bucket Filling								
Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type				
1	Mittal Processors Private Limited/75253	25	6.94	IPO				
2	Manikaran Power Limited/78172	25	7.99	RA				

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
Reverse Auction Participated Bidders Details								
Sl.No.	Bidder Ref. No.	Company Name	Contact Person	Email				
1	Manikaran Power Limited/74144	Manikaran Power Limited	JASMEET SINGH KALSI	nsk@manikaranpowerltd.in				
2	Tata Power Trading Company Limited/74174	Tata Power Trading Company Limited	SUMIT SACHDEV	tptclmarketing@tatapower.com				
3	Mittal Processors Private Limited/75253	Mittal Processors Private Limited	DARAPUREDDY SRI HARI	mukeshkumar@mittalsgroup.com				
4	Manikaran Power Limited/78172	Manikaran Power Limited	JASMEET SINGH KALSI	jsk@manikaranpowerltd.in				
5	Ideal Energy Projects Limited/308568	Ideal Energy Projects Limited	SANDIP VASANTRAO KAWALE	sandip.iepl@gmail.com				

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
World Trade Centre, Centre No.1, 13th Floor, Cuffe Parade, Mumbai 400005.
Tel. 022 22163964/65/69 Fax 22163976
Email: mercindia@merc.gov.in
Website: www.merc.gov.in

Case No. 37 of 2023
IA 24 of 2023 in Case No 37 of 2023

Case of Brihanmumbai Electric Supply and Transport Undertaking for the approval of tariff discovered through competitive bidding process for short term bilateral power purchase for the period from April, 2023 to March, 2024

Coram
Sanjay Kumar, Chairperson
I.M.Bohari, Member
Mukesh Khullar, Member

Brihanmumbai Electric Supply and Transport Undertaking: - Petitioner

Appearance
For Petitioner: - Shri. N.N Chougule (Rep)

ORDER

Date: 31 March, 2023

1. Brihanmumbai Electric Supply and Transport Undertaking(**BEST**) has filed this Case on 11 March, 2022 under Sections 63 of the Electricity Act, 2003(**EA, 2003**) read with Regulations 22 of MYT Tariff Regulations, 2019 for the approval of tariff discovered through competitive bidding process for short term bilateral power purchase for the period from April, 2023 to March, 2024.

2. **BEST's main prayers are as under:**

   a. *Hon'ble Commission may accord approval for short term power purchase quantum in replacement to the RE power which is not available for FY 2023-24.*

   b. *Hon'ble Commission may accord approval for short term bilateral power purchase of 199.74 Mus quantum for the period from April'2023 to March'2024 at average tariff of Rs 7.43/KWh discovered through competitive bidding process on DEEP* *portal undertaken by BEST for this;*

c. *Hon'ble Commission may accord approval for acceptance of the external offer received from M/s IEPL to supply 25 MW RTC power at Rs 7.85/KWh for April, May and June-2023 which is in line with the tender results. After including this external power purchase of 54.6 Mus at Rs 7.85/unit from M/s IEPL, the estimated average rate of power purchase cost for total 254.34 MUs for the period from 01stApril'2023 to 31st March'2024 will be Rs.7.52/kWh.*

d. *Hon'ble Commission may accord approval for additional power procurement from short term sources including power exchanges for optimization of power purchase cost and meeting any other shortfall at the average rate of Rs 7.52/kWh for FY 2023-24;*

3. BEST has filed Miscellaneous Application in IA No 24 of 2023 for urgent hearing of the matter as the power flow is to be scheduled from April 2023 to ensure power availability during the ensuing summer period.

4. **BEST in its Petition has stated as follows:**

4.1 The Commission, vide its MYT Order in Case No. 324 of 2019 dated 30 March, 2020 has approved power procurement and cost of such procurement for FY 2023-24 from various sources, including Renewable power for BEST as below:

Particulars	MYT Petition			Approved in this Order		
	Quantum (MU)	Total Cost (Rs.Cr.)	Avg. Rate (Rs./kWh)	Quantum (MU)	Total Cost (Rs.Cr.)	Avg. Rate (Rs./kWh)
TPC-G	3,608.21	1,578.69	4.38	3443.90	1669.82	4.85
Walwahan solar Energy Maharashtra (Erstwhile Welsun)	31.50	26.96	8.56	31.5	26.96	8.56
Manikaran Power Limited (Medium term)	744.60	335.24	4.50	744.60	335.24	4.50
Solar Energy	423.00	139.17	3.29	417.12	120.96	2.90
Non-Solar Energy				505.87	145.19	2.87
Bilateral Power Purchase	390.56	156.23	4.00	-	-	-
REC Non-Solar	512.31	173.35	3.38		-	-
Standby Charges	-	102.64	-		97.66	
Transmission Charges	-	297.73	-		254.91	
MSLDC Charges	-	1.64	-		1.35	
Total Power Purchase	**5,197.87**	**2,811.63**	**5.41**	**5142.99**	**2652.08**	**5.16**

4.2 The Commission has considered the entire purchase towards Renewable Purchase Obligations (RPO) for FY 2023-24 through existing contracted Renewable Energy (RE) (solar) source and purchase of RE power from competitive bidding route. Having considered the same and after considering quantum of power purchase through other BEST's Long/Medium term sources, the Commission has approved 'zero' quantum for power purchase from short term sources in FY 2023-24.

4.3 After approval of the Commission vide Order dated 26 April, 2021 in Case No. 16 of 2021, BEST has entered into PSA with Solar Energy Corporation of India (SECI) for procurement of 400 MW wind-solar hybrid power at tariff of Rs. 2.48 per unit discovered through competitive bidding for 25 years. Also BEST has entered into additional 234 MW standalone solar PSA with SECI after approval of the Commission vide Order dated 30 November, 2022 in Case No.120 of 2022 to meet the future obligation. The actual power flow from these projects is anticipated to commence only from December 2024 and June 2025 respectively. As such, quantum of RE energy through competitive bidding route, as approved by the Commission in MYT Order of BEST, will not be available in FY 2023-24.

4.4 BEST had floated two short term RE tenders on DEEP e-bidding Portal in the month of August 2022 and January 2023 to meet the RE Obligation for FY 2022-23 and FY 2023-24. There was no response from the bidders for these tenders.

4.5 As per its Long/Medium term PPA, the ex-bus availability at peak is 763 MW. BEST has allocation of 90 MW from TPC's Unit-7 (180 MW) gas based generating unit. In recent years, due to change in priority for the power sector, the allocation of Administered Price Mechanism (APM) gas to TPC's Trombay units from Gas Authority of India Limited (GAIL) has considerably reduced. This has resulted into lower generation from TPC's Unit-7 as seen from Plant Load Factor (PLF) of the plant in current fiscal year as tabulated below:

Month	Jan-22	Feb-22	Mar-22	Apr-22	May-22	June-22	July-22	Aug-22	Sept-22	Oct-22	Nov-22
PLF	19%	66%	44%	72%	47%	28%	7%	42%	21%	58%	13%

This generating unit during its service is operated on APM gas at average level of 110 MW. It is anticipated that the trend of lower generation from this generating unit may be likely to prevail in ensuing period due to lower APM gas availability and therefore, anticipated shortfall from this source to BEST will be around 45 MW.

4.6 TPC's Hydro resource is limited and is required to be used in the evening and night periods where the rates of power exchange are on higher side. Thus, during day peak, availability of hydro is low. Due to substantial increase in imported coal and foreign currency fluctuations, actual cost of coal based thermal generation from its contracted TPC's Unit-5 and Unit-8 has sharply increased. The Variable charge of these generating units, which was at Rs.3.31 per unit in January 2021 has now sharply shoot up to Rs. 8.58 per unit in January 2023. Further, prevailing geopolitical crises will have its further impact on prices of imported coal and natural gas in ensuing period.

4.7 After lifting of restrictions placed in Mumbai under Government of Maharashtra's Covid-19 guidelines, the economic activities have increased the electricity demand.

BEST's peak demand in current fiscal year is 890 MW in April 2022. The anticipated BEST's demand at day peak time will be approximately 880 MW during FY 2023-24. Hence, the realistic demand of three years is considered for projection. Details of pre-pandemic demand, actual demand of FY 2021-22, FY 2022-23 and projection for FY 2023-24 at T<>D in MW is as below:

Month/ Year	Pre-pandemic				Actual		Projected
	2017-18	**2018-19**	**2019-20**	**Average**	**2021-22**	**2022-23**	**2023-24**
April	858	897	862	872	692	890	**860**
May	916	912	873	900	658	843	**880**
June	917	939	927	928	685	866	**874**
July	817	789	812	806	716	745	**768**
Aug	809	785	799	797	696	765	**780**
Sept	879	809	786	824	692	773	**786**
Oct	869	893	851	871	779	807	**848**
Nov	758	809	791	786	761	712	**730**
Dec	713	720	760	731	652	744	**694**
Jan	707	636	672	671	614	634	**614**
Feb	752	664	712	709	616	-	**689**
March	832	794	747	791	773	-	**784**

4.8 The provisional transmission loss of 3.18 % is considered for grossing up the demand at G<>T. Accordingly, the estimated peak power demand projection and month-wise short term bilateral power requirement for April, 2023 to March, 2024 is as follows:

Projected peak Demand (FY2023-24)	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
T<>D level in MW	860	880	874	768	780	786	848	730	694	614	689	784
G<>T level in MW	888	909	903	793	806	812	876	754	717	634	712	810
Total availability (in MW)	718	718	718	718	718	718	718	718	626	643	643	718
Shortfall(-) /Surplus (+) (in MW)	-170	-191	-185	-75	-88	-94	-158	-36	-91	9	-69	-92
Proposed procurement												
00:00 to 24:00 Hrs, RTC (in MW)	50	50	50	0	0	0	50	0	0	0	0	0
09:00 to 18:00 Hrs (in MW)	75	100	75	40	50	50	100	40	75	0	50	50
Estimated total Power requirement (in MU)	56.3	65.1	56.3	11.2	13.9	13.5	65.1	10.8	20.9	0	13.1	13.9
Total (MU)	340.04											

4.9 In event of increase in BEST's demand over the predicted demand or in case of lesser power availability from contracted sources or to optimize the overall power purchase cost, the additional power will be purchased through Power exchanges.

4.10 Considering volatility in the short-term power market, particularly during high demand season, it is necessary to tie-up bilateral contracts to ensure reliability to meet the anticipated demand in ensuing period. BEST has invited e-tender for bilateral power purchase quantum 40 MW to 150 MW for different time slots (00:00 to 24:00 hrs (RTC) and 09:00 to 18:00 hrs) for the period from April 2023 to March 2024 on Discovery of Efficient Electricity Price (DEEP) portal on 30 January 2023. The result of the bidding process is summarized below:

Sr. No.	Contract Period	Slot / Time (Hrs.)	BEST's Bid Quantum	Successful Bidder	Source	Allotted Quantum in MW	Discovered Rate in Rs./ kWh
1	01 To 30-Apr-23	00:00 To 24:00	50	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.85
2	01 To 30-Apr-23	09:00 To 18:00	75	-	-	-	-
3	01To 31-May-23	00:00 To 24:00	50	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.85
4	01 To 31-May-23	09:00 To 18:00	100	-	-	-	-
5	01 To 30-Jun-23	00:00 To 24:00	50	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.85
6	01 To 30-Jun-23	09:00 To 18:00	75	-	-	-	-
7	01 To 31-Jul-23	09:00 To 18:00	40	Ideal Energy Projects Ltd (IEPL)	Ideal Energy Projects Ltd, Nagpur	40	5.90
8	01 To 31-Aug-23	09:00 To 18:00	50	Ideal Energy Projects Ltd (IEPL)	Ideal Energy Projects Ltd, Nagpur	50	6.24
9	01 To 30-Sep-23	09:00 To 18:00	50	Ideal Energy Projects Ltd (IEPL)	Ideal Energy Projects Ltd, Nagpur	50	5.99
10	01 To 31-Oct-23	00:00 To 24:00	50	Tata Power Trading Company Ltd (TPTCL)	JITPL, Odisha	25	7.84
				Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.84
11	01 To 31-Oct-23	09:00 To 18:00	100	Manikaran Power Ltd (MPL)	DIL, Chandrapur	63	8.48
12	01 To 30-Nov-23	09:00 To 18:00	40	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
				Manikaran Power Ltd (MPL)	BLAPPL, Madhya Pradesh	15	8.00
13	01 To 31-Dec-23	09:00 To 18:00	75	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
				Manikaran Power Ltd (MPL)	BLAPPL, Madhya Pradesh	25	8.00
14	01 To 29-Feb-24	09:00 To 18:00	50	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
				Manikaran Power Ltd (MPL)	DIL, Chandrapur	25	7.48
15	01To 31-Mar-24	09:00 To 18:00	50	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
				Manikaran Power Ltd (MPL)	DIL, Chandrapur	25	7.99

After considering discovered price and allocated quantity to successful bidder, the estimated average rate of power purchase cost for total 199.74 MU for the period from 01 April, 2023 to 31March, 2024 will be Rs.7.43 per unit.

4.11 The power requirement has been worked out by estimating the shortfall by considering all the contracted generation at its full capacity. This power will replace the RE power from SECI which was supposed to flow during FY23-24 and thus will help in meeting shortfall due to RE.

4.12 The average discovered rate of Rs 7.43 per unit is less than rates of TPC thermal units. Further it is less than the tariff of Rs 7.72 per unit adopted by the Commission in Case No 151 of 2022 for the period from August, 2022 to December, 2022. Also, the discovered price through above bidding is comparable with results of the bidding from April 2023 to October 2023 on DEEP portal by other Distribution Licensees.

4.13 Considering all above aspects, BEST intends to procure total allocated bid quantum at discovered price through competitive bidding for the period from April 2023 to March 2024 to ensure reliability of power supply during ensuing period. Accordingly, LoI has been issued to the successful bidders.

4.14 Further, in view of shortfall in the tender quantity on DEEP e-bidding portal, BEST has enquired with Trader/Generators who had participated in tender about additional availability with them. After issuance of LOI to the successful bidders, as per the rates discovered through DEEP portal, a generator M/s Ideal Energy Projects Limited (IEPL) has shown willingness to supply power by matching with the tender rate. The generator has offered 25 MW RTC power during the months of April, May & Jun 2023 at Rs 7.85 per unit. Details of the same are as follows:

Sr. No.	Contract Period	Slot / Time (Hrs.)	Shortfall in Bid Quantum	External offer	Total Quantum in MU	Offered Rate in Rs./ kWh
1	01-Apr-23 To 30-Apr-23	00:00 To 24:00	25	M/s Ideal energy projects limited	18	7.85
2	01-May-23 To 31-May-23	00:00 To 24:00	25	M/s Ideal energy projects limited	18.6	7.85
3	01-Jun-23 To 30-Jun-23	00:00 To 24:00	25	M/s Ideal energy projects limited	18	7.85
Total Mus					54.6	

4.15 It is observed that whenever rates touch the capping rate of Rs 12/kWh in power exchanges, partial or negligible quantum is cleared through DAM/RTM segments which results into overdrawal from the grid which subsequently affects grid security. Therefore, to ensure reliability of supply to Mumbai city, it is decided to accept the offer which in line with the results of DEEP e-bidding tender. LOI is being issued to the bidder (IEPL) with a condition of approval from the Commission.

4.16 After including this external power purchase of 54.6 MU at Rs 7.85/unit from M/s IEPL, the estimated average rate of power purchase cost for total 254.34 MU for the period from 01 April, 2023 to 31 March, 2024 will be Rs.7.52 per unit.

4.17 Under Intra-state Deviation Settlement Mechanism (DSM) framework, utility-wise decentralized scheduling of power is implemented. To optimize the power purchase cost by Discom, alternate cheaper power can be arranged in lieu of scheduling costly power from contracted generating units above its technical minimum level; keeping the view of overall grid security at the same time and as and when permitted by SLDC.

BEST is currently adopting this approach for scheduling of power and shall continue this approach in ensuing period to optimize its power purchase cost. This will considerably benefit the electricity consumers.

4.18 BEST's demand projection is not exceeding the previous peak demand. (Refer table at para.5 above). Thus, no additional transmission capacity is required for bringing the power in Mumbai. BEST pays Rs 257 Crores towards transmission charges (vide MERC Order No 327 of 2019). Accordingly, BEST's base transmission capacity right is 828 MW for FY 2023-24. During the month of April, 2022, the maximum Mumbai demand catered is 3851 MW. Out of this 2260 MW of demand was met through external sources outside Mumbai region.

4.19 As regards Mumbai tie-line, as per STU's submission with proposed addition in the transmission capacity, the total ATC for FY 2023-24 with reliability margin of 500 MW will be 3215 MW. The ATC allocation amongst all the discoms in proportion to Base TCR will ensure sufficient tie line capacity allocation to BEST for bringing the short-term power from outside Mumbai.

4.20 In view of above it is requested to adopt the tariff discovered through competitive bidding and approve short term power purchase.

5. During the E-hearing held on 23 March 2023, BEST reiterated their submissions made in the Petition and requested the Commission to approve proposed short term power procurement.

6. **BEST in its additional submission dated 24 March 2023 has stated as follows:**

6.1 E-bidding process was conducted on DEEP Portal and only eligible traders/Generators are allowed to participate on DEEP portal. M/s Kreate Energy (I) Private Limited (KEIPL), had confirmed that till date they hold a valid trading license and no regulatory commission had taken adverse action against them.

6.2 In view of shortfall in the tender quantum on DEEP e-bidding portal, BEST has enquired with Trader/Generators who had participated in tender about additional power availability with them to take advantage of lower discovered prices. IEPL has offered 25 MW RTC power during the months of April, May & Jun 23 at Rs 7.85 per unit which is discovered rate in tender on DEEP Portal for these respective months.

6.3 Another e-bid was floated on DEEP portal for the same time period and the rates discovered are much higher. The Comparative Statement is given below:

Month	New rates discovered for peaking power (09:00 to 18:00 hrs) in Rs/kWh	RTC rate of M/s IEPL as per old discovered rate in Rs/kWh
April'2023	10.25 to 10.70	7.85
May'2023	9.98 to 10.50	7.85
June'2023	8.98 to 10.50	7.85

6.4 As this power is a mandatory requirement for BEST, to avoid costly power from Power Exchange, to maintain grid security and to ensure reliability of supply to Mumbai city, BEST has decided to accept the offer from IEPL.

<u>Commission's Analysis and Ruling:</u>

7. Present petition has been filed by the BEST seeking approval for short-term power procurement for the period from April 2023 to March 2024 on account of anticipated shortfall and further seeking adoption of the tariff discovered through competitive bidding. BEST has also requested to approve the short-term power procurement of 25 MW for the period of April to June 2023 as an external offer received from the generator who is willing to match the rates discovered in the bidding process.

8. BEST in its Petition has summarised the reasons for such short-term power procurement. BEST while supporting the procurement stated that the Commission in the MYT Tariff Order amongst other sources has considered RE power through competitive bidding for FY 2023-24. However, as per actual schedule of tied up sources, the RE power will not be available in FY 2023-24. Further, BEST is anticipating reduction in supply for FY 2023-24 from gas based TPC Unit 7 on account of reduced availability of gas in the market and higher pricing for the same. Further increase in cost of imported coal has led to increase in variable cost of contracted sources. All these have necessitated BEST to optimise its power procurement cost. Therefore, considering the volatility in the market and to meet the anticipated demand, BEST has initiated the short-term power procurement. BEST has carried out the bidding on DEEP portal and requested the Commission to approve the same as per the provisions of MYT Regulations, 2019 and as per the MoP guidelines.

9. Considering the submissions made in the matter, the Commission frames following issues for its considerations:

   a. Provisions under which short term power procurement of Distribution Licensee requires approval of the Commission.

   b. Whether the quantum of additional short term power procurement proposed by BEST is justified??

   c. Whether the discovered tariff is consistent with the market trend?

   d. Whether PPA with IEPL for additional quantum which is based on offer outside bidding process can be allowed?

   The Commission is addressing these issues in following paragraphs.

10. **Issue A: - Provisions under which short term power procurement of Distribution Licensee requires approval of the Commission**.

10.1 The Commission notes the provisions under MYT Regulations, 2019 for the additional power procurement are as follows:

> *"22.1 The Distribution Licensee may undertake additional power procurement during the year, over and above the power procurement plan for the Control Period approved by the Commission, in accordance with this Regulation.*
>
> *22.2 Where there has been an unanticipated increase in the demand for electricity or a shortfall or failure in the supply of electricity from any approved source of supply during the Year or when the sourcing of power from existing tied-up sources becomes costlier than other available alternative sources, the Distribution Licensee may enter into additional agreement or arrangement for procurement of power.*
>
> *22.3 Any variation, during the first or second block of six months of a Year, in the quantum or cost of power procured, including from a source other than a previously approved source, that is expected to be in excess of five per cent of that approved by the Commission, shall require its prior approval:*
>
> *Provided that the five per cent limit shall not apply to variation in the cost of power procured on account of changes in the price of fuel for own generation or the fixed or variable cost of power purchase that is allowed to be recovered in accordance with Regulation 10."*

Thus, in cases where there is an anticipated shortfall in fulfilling the demand and to optimise the power purchase cost, licensee can procure additional power. Prior approval of the Commission is required if variation in quantum or cost is excess of five percent during the first or second block of six months of a Year.

10.2 Further Ministry of Power's Guidelines dated 30 March 2016 notified under Section 63 of the Electricity Act 2003 for short-term procurement of power by Distribution Licensees through tariff-based bidding process stipulate as follows:

> *"11.4 If the quantum of power procured and tariff determined are within the blanket approval granted by the Appropriate Commission in Annual Revenue Requirement (ARR) of the respective year, then the same will be considered to have been adopted by the Appropriate Commission.*
>
> *In all other cases, the Procurer(s) shall submit a petition to the Appropriate Commission for adoption of tariff within 2 days from the date of signing of PPA. Appropriate Commission should communicate the decision within 7 days from the date of submission of petition."*

Thus, if the quantum of power procured and the tariff determined are not within the blanket approval specified by the Commission in ARR/ Tariff Order, it necessitates the Commission to approve the additional power procurement and to adopt the tariff discovered through competitive bidding process.

10.3 The Commission notes the approved source wise quantum of power procurement for FY 2023-24 as per MYT Order in Case No 325 of 2019 is as follows:

Source	TPC-G	Walwahan Solar	Manikaran	Solar energy	Non solar Energy	Total
Quantum (MU)	3443.90	31.5	744.60	417.12	505.87	5142.99

As estimated power availability from other sources was sufficient to meet projected sales of BEST for FY 2023-24, the Commission has not included power from short term sources in above MYT Order. Therefore, rate for such short term power procurement is also not stated in MYT Order.

10.4 As explained in earlier paragraph, Distribution Licensees are allowed to procure power from short term sources for meeting shortfall in generation or increased demand. However, as rate for the same is not mentioned in the MYT Order, provision of Guidelines of Short-Term power procurement, as per which tariff discovered can be considered as deemed adopted if it is lower than rate approved in Tariff Order, does not become applicable here. Therefore, said Tariff discovered by the BEST for short term power procurement needs to be adopted by this Commission. Hence, prior approval of the Commission is required for proposed short term power procurement by BEST.

10.5 Having ruled as above, the Commission would like to clarify that under Muti Year Tariff frame work, BEST has already filed a Mid Term Review Petition seeking review of projections for FY 2023-24 to FY 2024-25 based on actual performance in past years. Said Petition is sub-judice before the Commission. When the Commission issues its Order on MTR Petition, approved power procurement mix and its tariff may undergo change for FY 2023-24 and FY 2024-25 wherein issue of non-availability of generation from RE sources will be addressed appropriately. But as power procurement proposed in present Petition is to be started from 1 April 2023 and some time period is required for completing procedural requirement, the Commission has decided to evaluate this petition based on approved parameters in MYT Order dated 30 March 2020.

11. **Issue B: - Whether the quantum of additional short term power procurement proposed by BEST is justified?**

11.1 The Commission notes that BEST has arrived at its demand projection based on realistic demand of the three years. BEST peak demand in the current year is 890 MW in April, 2022 and anticipated day time peak demand is projected to be 880 MW in FY 2023-24.

11.2 On supply side, BEST has considered all the contracted generation at its full capacity with its planned outages and non-availability of projected RE power. Further, BEST has envisaged that due to lower availability of APM gas, power availability from TPC-G's Unit 7 would be lower than its allocated share. Also due to variation in the imported coal market, BEST has envisaged supply of costly power from TPC-G Unit 5 and Unit 8. Considering all these factors, BEST has worked out supply shortfall of 40 to 100 MW from April 2023 to March 2024 and proposed to meet such shortfall through short term power procurement.

11.3 The Commission notes that even with such additional short term power procurement, the total energy procurement in terms of 'MU' is within the level approved in MYT Order. This is mainly due to non-availability of power from RE sources as envisaged in MYT Order. BEST has taken efforts for short term RE procurement on DEEP portal in August, 2022 and January, 2023 but had not received any bid. Hence BEST needs to fulfil this gap from the other sources.

11.4 The Commission notes that proposed short term power procurement is within the total power procurement quantum approved in tariff Order. Further projected peak demand is not exceeding the previous year demand. Hence the issue of transmission constraints will not arise for such short-term power procurement.

11.5 Considering above, quantum of short-term power proposed by BEST from April, 2023 to March, 2024 is justified.

12. **Issue C: - Whether the discovered tariff is consistent with the market trend?**

12.1 The Commission notes that BEST has undertaken the short-term power procurement as per the competitive bidding guidelines of MoP dated 30 March, 2016 by floating the bid on DEEP portal on 30 January, 2023 for supply of 40 to 150 MW for various time slots for the period from April, 2023 to March, 2024. The weighted average tariff discovered in bidding process is Rs 7.43 per unit.

12.2 To assess the competitiveness of the tariff discovered by BEST in the present bidding the Commission has referred to recent discovered tariff on DEEP Portal by other Distribution Licensees in Maharashtra and same is tabulated below: -

Sr No	Particulars	Period	Availability	Quantum of Power in MW	Discovered rate in Rs/ kWh
1	TPC-D	1.4.2023 to 30.04.2023	RTC	50 MW	14
		1.05.2023 to 31.05.2023	RTC	50 MW	14
		1.06.2023 to 15.06.2023	RTC	50 MW	14
2	BEST	1.4.2023 to 30.04.2023	9:00 to 18:00	13MW	10.25
				50 MW	10.25
				50 MW	10.7
		1.05.2023 to 31.05.2023	9:00 to 18:00	13 MW	9.98
				50 MW	9.98
				10 MW	10
				50 MW	10.5
		1.06.2023 to 15.06.2023	9:00 to 18:00	13 MW	8.98
				50 MW	8.98
				10 MW	10.0

Sr No	Particulars	Period	Availability	Quantum of Power in MW	Discovered rate in Rs/ kWh
				50 MW	10.5
		1.10.2023 to 31.10.2023	9:00 to 18:00	37 MW	10.5
		1.12.2023 to 31.12.2023	9:00 to 18:00	25 MW	10.5

12.3 It is observed that BEST itself has received higher rates in the tenders floated for fulfilling the gap of the earlier tender. Also, the Commission in its Order in Case No 151 of 2022 has approved the tariff of Rs 7.72 per unit for the bilateral power purchase from August, 2022 to December, 2022. Present weighted average of discovered tariff of Rs 7.43 per unit is less than above approved rate.

12.4 At the same time, the Commission notes that at present the day ahead rates being discovered on Power Exchange is in the rage of Rs 4 to Rs 6 per unit which is much lower than discovered rate. But BEST has contended that in high demand season, rate on power exchange may vary and also there is no guarantee of clearing 100% of bid quantity. Hence, for ensuring reliable supply to its consumers, BEST has opted for short term power procurement on DEEP portal.

12.5 The Commission notes that BEST has carried out the process of procurement of Short-Term Power in accordance with Competitive Bidding Guidelines and tariff discovered is reflective of tariff being discovered on DEEP Portal.

12.6 Section 63 of the EA, 2003 mandates the Commission to adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.

12.7 In view of the foregoing, the Commission notes that tariff discovered by BEST fulfils mandates and requirements for adoption as set out in Section 63 of the EA, 2003 and MYT Regulations, 2019. Accordingly, the Commission adopts Power Procurement with weighted average tariff of Rs 7.43 per unit and quantum for BEST undertaking for the period from April,2023 to March, 2024 as follows

Sr. No.	Contract Period	Slot / Time (Hrs.)	Successful Bidder	Source	Quantum (MW)	Tariff (Rs./ kWh)
1	01 To 30-Apr-23	00:00 To 24:00	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.85
2	01To 31-May-23	00:00 To 24:00	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.85
3	01 To 30-Jun-23	00:00 To 24:00	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.85
4	01 To 31-Jul-23	09:00 To 18:00	Ideal Energy Projects Ltd (IEPL)	Ideal Energy Projects Ltd, Nagpur	40	5.90
5	01 To 31-Aug-23	09:00 To 18:00	Ideal Energy Projects Ltd (IEPL)	Ideal Energy Projects Ltd, Nagpur	50	6.24
6	01 To 30-Sep-23	09:00 To 18:00	Ideal Energy Projects Ltd (IEPL)	Ideal Energy Projects Ltd, Nagpur	50	5.99
7	01 To 31-Oct-23	00:00 To 24:00	Tata Power Trading Company Ltd (TPTCL)	JITPL, Odisha	25	7.84

Sr. No.	Contract Period	Slot / Time (Hrs.)	Successful Bidder	Source	Quantum (MW)	Tariff (Rs./ kWh)
			Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	7.84
8	01 To 31-Oct-23	09:00 To 18:00	Manikaran Power Ltd (MPL)	DIL, Chandrapur	63	8.48
9	01 To 30-Nov-23	09:00 To 18:00	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
			Manikaran Power Ltd (MPL)	BLAPPL, Madhya Pradesh	15	8.00
10	01 To 31-Dec-23	09:00 To 18:00	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
			Manikaran Power Ltd (MPL)	BLAPPL, Madhya Pradesh	25	8.00
11	01 To 29-Feb-24	09:00 To 18:00	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
			Manikaran Power Ltd (MPL)	DIL, Chandrapur	25	7.48
12	01To 31-Mar-24	09:00 To 18:00	Kreate Energy (I) Pvt Ltd (KEIPL)	LMEL, Chandrapur	25	6.94
			Manikaran Power Ltd (MPL)	DIL, Chandrapur	25	7.99

12.8 The Commission also notes that LOAs initialed with the successful bidders are in line with the Standard Bidding documents issued by MoP. Based on these submissions, the Commission approves the draft PPAs to be signed with above successful bidders at the tariff and for the quantum mentioned in above table in Para 11.5. BEST shall submit copies of final PPAs for records of the Commission.

12.9 Having allowed above power procurement, the Commission notes that in the past some of the Distribution Licensees in the State have suffered due to non-honouring of short Term PPA by Trader/Generator. BEST shall remain vigilant to avoid such incidences in future. It shall take all the necessary actions to avoid such situation considering the likelihood of a very tight demand supply situation during peak season.

13. **Issue d: Whether PPA with IEPL for additional quantum which is based on offer outside bidding process can be allowed ?**

13.1 BEST has submitted that in view of the shortfall in the tendering quantity on DEEP portal, it has enquired with the generators that participated in the tender about additional availability with them. In reply BEST has received offer from IEPL to supply 25 MW RTC power during April to June 2023 by matching the discovered rate of Rs. 7.85 per unit.

13.2 The Commission observes that IEPL in the original bidding process has quoted for the time blocks of 9:00 to 18:00 for the month of July 2023 (40MW @ Rs 5.90 per unit), August 2023 (50MW @ Rs 6.24 per unit) and September, 2023 (50 MW @ Rs 5.90 per unit) and has not quoted for any power to be supplied during April to June 2023. Hence, the said offer cannot be considered as part of bidding process.

13.3 BEST in its submission has itself called it as external offer but still has justified it for approval on the ground that it has not got required quantum of power during bidding process and IEPL has agreed to match discovered tariff which is lower than tariff discovered by the BEST in separate bidding process for same period.

13.4 In this regard, the Commission notes that its power to adopt tariff under Section 63 of the Electricity Act 2003 is limited to tariff discovered based on transparent competitive bidding process as per competitive bidding guidelines stipulated by the Govt. of India. Offer of IEPL, which is outside bidding process, cannot be considered as bid discovered as per competitive bidding guideline and hence the Commission cannot adopt such tariff submitted post bidding process.

13.5 In view of above, the Commission is rejecting the request of BEST for procurement of RTC power from IEPL which was not part of bidding process. For fulfilling its power requirement, if required, BEST may initiate fresh bidding process and IEPL can participate in the same which will be the correct process as envisaged under the Electricity Act, 2003.

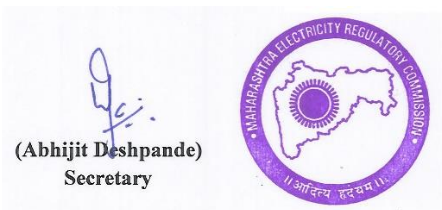
14. BEST has also requested to allow procuring additional short term power from sources including power exchange for meeting demand of its consumers. In this regard, the Commission notes that Distribution Licensee needs to take all efforts to meet their consumer demand in most optimum manner. Therefore, BEST is free to procure additional power if required, from power exchanges or other short term sources as per competitive bidding guidelines and the Regulatory provisions governing such procurement.

15. Hence, following Order:

<u>ORDER</u>

1. **Case No. 37 of 2023 is partly allowed.**
2. **Under Section 63 of the Electricity Act, 2003, the Commission adopts Short Term Power Procurement for the period from April 2023 to March, 2024 by as Brihanmumbai Electric Supply and Transport Undertaking as stated in para 12.7 above.**
3. **Brihanmumbai Electric Supply and Transport Undertaking, to submit copies of Final PPAs to the Commission for records.**

Sd/-	**Sd/-**	**Sd/-**
(Mukesh Khullar)	**(I.B.Bohari)**	**(Sanjay Kumar)**
Member	**Member**	**Chairperson**



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The Brihanmumbai Electric Supply & Transport Undertaking
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

BEST

Notice Inviting e-Tender

Brihanmumbai Electric Supply & Transport Undertaking (BEST) invites bids for purchase of power on short term basis for the months April-2023, May-2023, June-2023, October-2023 and December-2023 through National e-bidding process.

The bid document for participation can be downloaded through DEEP e-portal of **www.mstcecommerce.com** from 10:00 hrs of 03.03.2023. Bids must be submitted online through this portal on or before 17:00 hrs of 11.03.2023. Any corrigendum will be published on the referred website only.

General Manager
BEST Undertaking

PRO/DEPM/192/2023

FPJ

Business Standard
3/3/2023

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General Manager
BEST Undertaking

PRO/DEPM/192/2023

Business standard 3/03/203

THE BRIHANMUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING
(OF THE BRIHANMUMBAI MAHANAGAR PALIKA)

Tender No: BEST/Short/23-24/ET/11
(In Continuation with tender no. BEST/Short/23-24/ET/1)
&
BEST/Short/23-24/RA/11

Bid Document

For

Purchase of Short-term Bilateral Power

Through

E-Tendering and E-Reverse Auction Basis

By

Brihanmumbai Electric Supply & Transport Undertaking

Date: 10.03.2023

INVITATION FOR e-TENDER
No: BEST/Short/23-24/ET/11
(In Continuation with tender no. BEST/Short/23-24/ET/1)

Sr. No.	Event	Date/Time
1.	Publication of Bid Document/ Activation of Event	**10.03.2023 at 13:00 hrs.**
2.	Last date of submission of Bids including EMD	**13.03.2023 at 17:00 hrs.**
3.	Opening of Non-financial Technical Bids	**14.03.2023 at 10:00 hrs**
4.	Opening of IPOs	**15.03.2023 at 10:00 hrs**
5.	Start of e-Reverse Auction	**15.03.2023 at 12:00 hrs**

Bids to be submitted through	**DEEP e-bidding portal at www.mstcecommerce.com**
Office inviting Bids and place of submission of EMD	**Divisional Engineer,** **Power Management Department,** **BEST Undertaking,** **1st Floor, Multi-storied Building Annex.** **BEST Marg, Colaba, Mumbai-400001** **Tel:- 022-22799555** **e-mail:- depower@bestundertaking.com**

1. INTRODUCTION AND BACKGROUND:-

Brihanmumbai Electric Supply & Transport Undertaking, here in after referred to as the **"BEST"**, a Distribution Licensee supplying electricity in the Mumbai City is inviting bids for procurement of power under Short Term arrangement for the month of April'2023, May'2023, June'2023, October'2023 and December'2023 to meet its demand as per Terms and Conditions of this Bid Document (**Annexure-I**).

Bids are invited from various Trading licensees / Generators / State Utilities / CPPs / Distribution licensees / SEBs for purchase of power. The power would be procured in line with" Guide lines for short-term (i.e. for a period of more than one day to one year) Procurement of Power by Distribution Licensees through Tariff based bidding process" issued by Government of India - Ministry of Power under Section 63 of the Electricity Act, 2003 and as amended from time to time. The responsibility of the

Successful Bidder(s) would be to supply power to BEST as per the Terms and Conditions of the Bid Document.

All the interested Bidders shall participate in the bidding process by downloading Bid Document from DEEP e-bidding Portal. The link of e-bidding Portal is **www.mstcecommerce.com**. Bidder needs to register on the e-bidding portal on MSTC website.

2. E-bidding FEE:-

All the Bidders would be able to participate in the e-bidding events on making payment of the requisite fees of Rs.500 per MW per requisition for the total capacity sought for that particular requisition for which a Bidder is willing to bid to PFC Consulting Limited (PFCCL). The requisite fee plus applicable taxes shall be deposited through the portal by e-Payment Gateway provided by MSTC Ltd. After the completion of the bidding process, only successful Bidder(s) will have to pay these charges for the quantum allocated to each Bidder. The balance amount will be refunded by PFCCL within seven (7) working days without any interest. The fee deposited by non-selected Bidder(s) will also be refunded by PFCCL within seven (7) working days of completion of the event without any interest.

3. Quantum of Power:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement for the month of April’2023, May’2023, June’2023, October’2023 and December’2023 from various sources. The Bidder(s) shall supply power as mentioned below to BEST:

Requisition No.	Contract Period		Slot/ Time (Hrs.)			Quantum (in MW)	Minimum Bid Quantity (in MW)	Delivery Point
	From	To	From		To			
1.	01-Apr-23	30-Apr-23	09:00	To	18:00	75	10	Maharashtra STU Periphery
2.	01-May-23	31-May-23	09:00	To	18:00	100	10	Maharashtra STU Periphery
3.	01-Jun-23	30-Jun-23	09:00	To	18:00	75	10	Maharashtra STU Periphery
4.	01-Oct-23	31-Oct-23	09:00	To	18:00	37	10	Maharashtra STU Periphery
5.	01-Dec-23	31-Dec-23	09:00	To	18:00	25	10	Maharashtra STU Periphery

The Bidder(s) should be capable to supply power to BEST during the contracted period at the delivery point, for which the responsibility will be of the Bidder(s). Bidder/s shall ensure necessary infrastructure/ground work in this regard, while participating in the Bid.

4. Qualification Criteria:-

a. All the Generators/State Utilities /CPPs /Distribution Licensees /SEBs and trading licensees having valid trading license from Appropriate Commission are qualified to participate in the bidding process.

b. The Bidder must quote not less than Minimum Bid Quantity, as mentioned in the table above, from single source of generation.

c. If Bidder being an electricity trading licensee, then the trader(s) should submit a valid license from CERC/SERC for Inter-state /Intra-state trading of electricity. The trader shall also attach a photocopy of the same along with the Bid.

5. Submission of Bid:-

The Bidders shall submit their Bids on-line, through DEEP e-bidding portal only.

A) Non-Financial Bid Comprising of:

a) Acceptance to Terms and Conditions of Bid document (**Annexure-II**).

b) Bid Security (EMD) in the form of Bank Guarantee issued by any Nationalized/Scheduled Bank.

c) Source from which Bidder shall supply power shall be mentioned.

d) In case Bidder is Trader, scanned copy of valid Trading license from appropriate Commission should also be provided.

e) Copy of the authorization received from the Generator (in case of trader).

f) Board resolution/Authorization for signing the Bid document.

B) Financial Bid:-

Bidders shall be required to submit separate Non-Financial Technical Bids and Financial Bids i.e. Initial Price Offer (IPO) as per the following time-table:-

Event	**Date and time**
Date of publication of Bid document / Activation of Event	**10.03.2023 at 13:00 hrs.**
Submission of Bid (online Digitally signed Non-Financial Technical bid & IPOs)	**13.03.2023 at 17:00 hrs.**
Opening of Non-Financial Technical Bids	**14.03.2023 at 10:00 hrs**
Clarification, if any, sought from bidders	**14.03.2023 at 17:00 hrs**
Opening of IPOs	**15.03.2023 at 10:00 hrs**
Start of e-Reverse Auction	**15.03.2023 at 12:00 hrs**
Submission of Application for Open Access	**As per Open Access procedure/regulations**
Approval and Obtaining SLDC consent by the seller/purchaser.	

Note: BEST may extend the timelines of Bid with intimation to all Bidders through DEEP e-bidding portal only.

The Bidders are required to upload scanned copy of the EMD along with the Bid and the original copy of EMD to be sent so as to reach the address as given below on or before **17:00 hrs of 13.03.2023**:

Divisional Engineer,
Power Management Department,
BEST Undertaking,
1st Floor, Multi-storied Building Annex.
BEST Marg, Colaba,
Mumbai-400001.
Tel:- 022-22799555

6. BIDDING PROCESS:-

a. The Bidder shall use one Digital Signature to submit bid through one login and for each e-bidding event shall comprise of two parts i.e. e-Tender and e-Reverse Auction. An event may have multiple requisitions (i.e. independent requirements of power at different time or places). To participate in the event, each Bidder will have to specify the source of power for that particular bid. Each bid will have only one price per requisition accompanied by the total quantum of power the Bidder intends to supply and minimum threshold quantum acceptable to the Bidder. However, the Bidder shall have the option to choose the requisition of an event in which it intends to participate. Each of the Bids will have to be signed by the Digital signature of the Bidder.

b. Each login the bidder may submit only one price bid from one source. However, against each requisition the Bidder have the option to bid multiple bids from separate login either from same or different sources.

c. The Bidder shall quote the single tariff at delivery point up to three (3) decimals which shall include capacity charge, energy charge, trading margin (in case of Bidder being a Trader) and all taxes, duties, cess, levies etc. Open Access charges up to and beyond the delivery point shall be borne by the Bidder. The price quoted shall not change in case if any tax/ duty/ levy/cess/charges become applicable after the submission of Bids. The tariff should be constant and there shall be no escalation during the contractual period.

d. Each event of the auction would require independent Digital Signature of the Bidder.

e. Bidders shall be required to submit separate Non-Financial Technical Bid and Financial Bids i.e. Initial Price Offer (IPO) through e-bidding portal.

f. The Bidders can revise their IPOs before date and time of submission of Bid Document.

g. After acceptance of the Non-Financial Technical Bids, the Financial Bids shall be opened as per schedule given in event time table.

h. In the event, if two or more Bidders quote the same amount of Tariff during IPO and e-Reverse Auction stage, the time of submission of Bid will be the deciding factor for their ranking.

i. The elimination of the Bidders shall be done by the following method:

1) After the opening of Initial Price Offers, the system will rank the Bidders according to their price bids. The Bidder with the highest price bid in IPO stage will be called the H1 Bidder. The system will then analyze all the quantities offered by the Bidders in the IPO stage. If the total quoted quantity is greater than twice the Requisitioned Quantity, the Highest Bidder (H1) will be eliminated provided that the

total quoted quantity after elimination is not less than or equal to twice the Requisitioned Quantity.

2) The Elimination process will be done for each of the requisition separately.

3) The shortlisted Bidder after elimination will be intimated individually by system generated emails only.

j. The Reverse auction will start within 120 minutes of opening of Initial Price Offers and shall continue for a period of next 120 minutes.

k. Provided that during the last 10 (ten) minutes before the scheduled close time of e-Reverse auction, if a price bid is received which is lower than the lowest prevailing price bid recorded in the system during e-Reverse auction, the close time of e- Reverse auction will be automatically extended by 10 (ten) minutes from the time of the last price bid received. This process of auto-extension will continue till there is a period of 10 (ten) minutes during which no price bid are received which is lower than the prevailing lowest price bid.

l. During the Reverse Auction the Bidders will have the option of reducing the tariff quoted by them in decrements of one paisa or multiples thereof and to increase the quantum quoted by them by 1 MW or multiples thereof. During the Reverse Auction the prevailing Lowest Tariff would be visible to all the Bidders.

m. The Bidders will have the option to increase the quantum of power upto corresponding to the value of EMD submitted along with IPO, but decrease the Tariff during the e-Reverse Auction process.

7. Contract Documents:-

BEST shall intimate to Bidder(s) regarding award of contract for supply of power (whose Bid has been accepted) through a Letter of Intent (LoI).

8. Compliance to the Terms & Conditions:-

The Bidders are advised to ensure that the Bid is fully compliant with the requirements specified and Terms and Conditions contained in the Bid Document. No deviation from these conditions is permissible and a Bid with any deviation shall be summarily rejected.

9. **Earnest Money Deposit (EMD):-**

a. The Bidder shall be required to submit EMD of Rs. 30,000 per MW per month (for 30 days, 24 hours and same shall be reduced on pro-rata basis) of offered capacity in the form of Bank Guarantee (Format Enclosed-**Annexure-III**) issued by any Nationalized/Scheduled Bank in favour of "The General Manager, Brihanmumbai Electric Supply & Transport Undertaking" payable at Mumbai, **valid till 31.03.2023**.

Example: For a requirement of 2 MW for 15 days for 4 hours, the EMD shall be = Rs. 30,000 x 2 MW x (15 days/30 days) x (4 hrs/24 hrs) = Rs. 5000/-

All costs/expenses/charges associated with the bidding, including bank guarantee etc. shall be borne by the Bidder. The validity of the EMD shall be extended by the Bidder if required by BEST.

BEST's bank details are as follows:

Name: BEST Undertaking

Account No.: 0106261008935

Name of Bank: Canara Bank

Branch name: Colaba

IFSC Code: CNRB0000106

b. The EMD shall be forfeited,

- If Bidder withdraws or modifies bid during Bid Validity Period.
- If Bidder fails to supply power after issue of Letter of Intent (LoI).
- Bidder failure in performing its contractual obligations.
- For Non submission of Contract Performance Guarantee by successful bidder.

c. The EMD of successful Bidder shall be released after submission of Contract Performance Guarantee as per Clause No. 10 below.

d. The EMD of unsuccessful bidder shall be released within 15 days from date of expiry of Bid validity period.

e. If it is observed that EMD of Bidder(s) has not been submitted or is less than the specified amount, the bid shall be rejected and Financial Bid submitted by such a

Bidder shall not be opened.

No interest shall be paid on the Earnest Money Deposit.

10. Contract Performance Guarantee (CPG):-

a. Successful bidders are required to produce CPG within 7 days from date of Issue of Letter of Intent (LoI) to successful bidder for an amount of Rs 2 Lac per MW per Month (for 30 days, 24 hours) of contract period or part thereof. The CPG for the procurement of power on hourly basis shall be calculated on pro-rata basis as per the example given above for calculating EMD.

b. CPG to be issued by Nationalized/ Scheduled bank and valid for the period of contract and 1 month post expiry of contract. All costs/expenses/charges associated with CPG shall be borne by the Bidder. Refer Clause 9 above for BEST's bank details.

c. In case of CPG submission delay within stipulated period, Bid security i.e. EMD shall be forfeited.

d. CPG to be released after 30 days of completion of contract period.

e. The CPG provided by the successful bidder shall be forfeited for not performing the contractual obligations.

11. BEST's right- Acceptance/Rejection of Bid:-

This Bid document may be withdrawn or cancelled by BEST at any time without assigning any reasons thereof. BEST further reserves the right, at its complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account. The entire bidding process is subject to approval of Maharashtra Electricity Regulatory Commission.

12. Modification of the Bid Document:-

BEST reserves the right to modify any part of the Bid Document by issuing one or more amendments prior to the last date of submission of the Bid ("Amendment").

Any Amendment shall form part of the Bid Document, and shall be binding on bidders.

Any corrigendum/ clarifications with the Bid document and/or the Bidding process shall be published on the DEEP e-bidding portal only.

13. **Bid Validity Period:-**

The validity period of offer of Bidder shall be till **31.03.2023.**

14. **Governing Law:-**

All matters arising out of or in conjunction with the Bid Document and/or the bidding process shall be governed by and construed in accordance with Indian Law and the courts of Mumbai, Maharashtra shall have exclusive jurisdiction.

15. **Condition Precedent:-**

The Award of Contract i.e. Letter of Intent (LoI) is subject to approval, clearances, and permissions from all authorities i.e. Maharashtra State Electricity Regulatory Commission, RLDC / SLDCs etc.

16. **Disclaimer:-**

Neither BEST nor its employees or consultants shall be liable to any Bidder or any other person under any law including the law of contract, tort, the principles of restitution or unjust enrichment or otherwise for any loss, expense or damage which may arise, or be incurred, or suffered, in connection with the Bid, or any matter that may be deemed to form part of the Bid document or any other information supplied by or on behalf of BEST or its employees or consultants. For the avoidance of doubt it is expressly clarified that this Bid Document is an offer to Bid and is subject to the award of Letter of Intent (LoI) by BEST.

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Annexure-I

General Terms and Conditions

1. Quantum:-

BEST invites bids for purchase of firm power under Short Term Open Access arrangement. The Bidder(s) shall supply power as mentioned below to BEST:

Requisition No.	Contract Period		Slot/ Time (Hrs.)			Quantum (in MW)	Minimum Bid Quantity (in MW)	Delivery Point
	From	To	From		To			
1.	01-Apr-23	30-Apr-23	09:00	To	18:00	75	10	Maharashtra STU Periphery
2.	01-May-23	31-May-23	09:00	To	18:00	100	10	Maharashtra STU Periphery
3.	01-Jun-23	30-Jun-23	09:00	To	18:00	75	10	Maharashtra STU Periphery
4.	01-Oct-23	31-Oct-23	09:00	To	18:00	37	10	Maharashtra STU Periphery
5.	01-Dec-23	31-Dec-23	09:00	To	18:00	25	10	Maharashtra STU Periphery

2. Delivery Point:-

The Interface of Transmission network of Maharashtra State (i.e. Maharashtra STU Periphery).

3. Open Access Charges, transmission Losses and other Charges:-

All Open Access charges i.e. Transmission charges & losses, POC injection /withdrawal charges and losses, reliability support charges, Scheduling & operating charges of RLDC/SLDC, RLDC application fee or any other charges/fees upto delivery point shall be borne by the Bidder. The Open Access charges beyond delivery point (i.e. Maharashtra State Scheduling charges and Application charges) shall also be borne by the Bidder. Any revision in these charges if become applicable after the submission of Bids shall be on account of the Bidder.

BEST is a Long-Term Transmission System user of Maharashtra State. Hence, Maharashtra State transmission (InSTS) charges and losses are not applicable. Therefore, bidders while quoting need not factor Maharashtra State

Transmission charges and Losses.

BEST does not have any Interstate LTOA/MTOA contract. Same may be factor into while quoting tariff and during application for Open Access.

If the power is being supplied through alternate source, additional charges and losses if any, due to cancellation of existing corridor and booking of new corridor etc., shall be to the account of the Bidder.

In case of reduction or cancellation of open access schedule, the defaulting party will bear all open access charges thereof in accordance with MERC (Transmission Open Access) Regulations, 2016 / procedure for Scheduling of bilateral transaction by CTU dated 28.01.2008 and subsequent amendments from time to time.

4. Open Access and Scheduling:-

After receipt of Letter of Intent (LoI) for supply of power, the Bidder has to apply for booking of transmission corridor for full contracted quantum for contracted period of supply for which is issued and acknowledge the acceptance of the same. Any revision in contracted quantum by the Supplier will not be accepted. There will be no liability on payment for BEST to pay the excess energy supplied by the Supplier on its own accord.

The Bidder shall book for open access on firm basis upto delivery point in accordance with procedure of bilateral transaction based on CERC's Open Access Regulations, 2008/ MERC (Transmission Open Access) Regulations, 2016 with amendments from time to time. Any liability on account of open access or any clarification on open access upto and beyond the delivery point will not come under purview of BEST.

BEST shall have the right to surrender/cancel open access at any time due to any unforeseen circumstances. Bidder shall have to respond immediately on request from BEST and arrange to surrender/cancel open access.

Both BEST and the Bidder shall schedule this power in full except in case of Force Majeure. The scheduling and dispatch of the power shall be coordinated with respective RLDCs/SLDCs as per the relevant provisions of IEGC/State Grid Code Regulations, 2020, frame work of MERC’s Deviation Settlement Mechanism (DSM) and decisions of RLDCs, SLDCs and RPCs.

Final Energy accounting shall be as per the REA/SEA issued by the concerned RLDC/RPC/SLDC.

5. Tariff:-

Bidder shall quote firm price (Rs./kWh) at delivery point for each contracted period mentioned in the bid document and shall be inclusive of capacity charges, variable charges, trading margin, all taxes, duties, levy, cess etc. imposed by Central/State governments / Statutory authorities, etc..

The Tariff shall not change during contractual period if any tax / duty / levy / cess / charges / fees become applicable after the submission of bids.

Bidder shall quote the single tariff at delivery point up to three decimals.

In case Bidder being trader, should ensure that trading margin charged should be as per norm of appropriate regulatory commission.

6. Supply from alternative sources:-

In case of failure of the generation source, Bidder shall have to supply power from alternative source(s) with intimation to BEST. The supply from the alternative source(s), if any, would be made at the same tariff at which supplier has contracted power with BEST. Any additional liability in supply of power from alternative source(s) shall be borne by the Bidder.

7. Billing Cycle:-

Bidder(s) shall raise Provisional weekly energy bills based on daily schedule issued by Maharashtra SLDC / WRLDC. The blockwise energy schedules shall be rounded off to nearest second decimal point. The Final bill to be issued based on the REA published by the WRPC for Inter-state power and SEA based on DSM issued by

MSLDC for Intra-state power. After receipt of REA of WRPC/ SEA statement of MSLDC, Final bill shall be raised by the Bidder for necessary adjustments.

8. **Payment:-**

Energy Bill:

BEST shall make payment to Bidder(s) in Bidder(s) bank account by RTGS within thirty (30) days from the receipt of correct bill, which will be the due date.

BEST will be eligible for prompt payment rebate @ 2% on energy bill amount, if the payment is made within seven (7) days (Excluding Sundays and Bank holidays) from the receipt of correct energy bill, through email/courier.

Compensation Bill:-

For any Compensation payable by BEST/Bidder, invoice shall be raised by Bidder/BEST as the case may be and payment shall be made within 30 days from the date of receipt of correct bill.

In case the due date falls on Sunday/ Bank holiday, then the next working day would be considered as due date. This is applicable to all above referred Bills.

Surcharge on delayed payment (if any) for all above Bills shall be as follows:

1.25% per month on all outstanding payments after the 30th day from the date of receipt of correct bill. The surcharge shall be calculated on a day-to-day basis for each day of the delay after due date.

9. **Compensation Clause for failure to Supply/ Off-take the Quoted capacity:-**

Both the parties would ensure that actual scheduling does not deviate by more than 15% of the contracted power as per the approved open access on monthly basis or actual period (if period is less than a month) during Contracted period.

Without prejudice to provision of force majeure, if Bidder fails to supply contracted quantum of energy as per approved open access on monthly basis in the Contracted period, Bidder shall pay compensation to BEST @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15 % in the Contracted period.

In case BEST defaults in off take of contracted quantum of energy as per approved open access on monthly basis in the Contracted period, BEST shall pay to Bidder @ 20% of tariff per kWh for the quantum of energy that falls short beyond permitted deviation of 15% in the Contracted period.

Allowable reduction in quantum of power, if required, shall be uniformly spread over the month as far as possible.

Compensation on account of shortfall in supply/Off-take will be settled separately on monthly basis and either party shall raise invoice to claim compensation. For any Compensation payable by BEST/Bidder as above, invoice shall be raised by Bidder/BEST as the case may be within 1st week after completion of the month and payment shall be made within 30 days from the date of receipt of invoice.

Bidder must apply for Open access for full contracted capacity. If the Bidder does not apply for open access for full quantity, then this would be treated as default in supply of power by the Bidder and compensation provision will apply.

In case the Bidder/Seller fails to offer the contracted power as per the Agreement to BEST and sells this power without BEST's consent to any other party, BEST shall be entitled to claim damages from the Bidder/Seller for an amount equal to the higher of : (a) twice the Tariff as per the PPA for the corresponding contracted power ; and (b) the entire sale revenue accrued from Third Parties on account of sale of this contracted power. These damages shall be in addition to Compensation as mentioned above, for failure to supply the contracted capacity.

Further a complaint to this effect will be made by BEST to the concerned load dispatch centre. The Bidder/Seller shall be debarred from participating in power exchanges and also from scheduling of this power in any short term/ medium term / long term contracts from that generating station for a period of three months from the establishment of default, in the complaint. The period of debarment shall increase to six months for second default and shall be one year for each successive default.

10. Force Majeure:

A "Force Majeure Event" shall mean any event or circumstance or combination of events or circumstances (not otherwise constituting an Indian political Event) that adversely affects, prevents or delays any party in the performance of its obligation in accordance with the terms of this Agreement, but only if and to the extent that (i) such events and circumstances are not within the reasonable control of the affected party, and (ii) such events or circumstances could not have been prevented through employment of Prudent Utility Practices.

Neither party shall be in breach of its obligations pursuant to this understanding to the extent that the performance of its obligation was prevented, hindered or delayed due to Force Majeure Event, and without in any way prejudicing the obligation of either Party to make payments of amounts accrued due prior to the occurrence of the event of Force Majeure, which shall be payable on the original Due Date.

Force Majeure Events shall mean the occurrence of any of the following events:-

a) Act of war, invasion, armed conflict, blockade, revolution, riot, insurrection or civil commotion, terrorism, sabotage, fire, explosion or criminal damage;

b) Act of God, including fire, lightning, cyclone, typhoon, flood, tidal wave, storm, earthquake, landslide, epidemic, pandemic or similar cataclysmic event;

c) Any curtailment/suspension/non-availability of transmission capacity by intervening SLDCs and/or RLDCs;

d) Any restriction imposed by any RLDCs;

e) Regulatory intervention in the matter of power trading as also orders from CERC/ SERCs/ Appellate Tribunal of Electricity/High Courts/ Supreme Court particularly related to rates at which power can be sold/ purchased/traded. This will also include regulations / orders already issued but yet to be conclusively enforced. Any directive by Government of Maharashtra not to export power outside Maharashtra state boundary.

11. Change in Law:-

Since the tender is invited for short term period at firm price, any variation in price due to any reasons what so ever, including change in Law, will not be applicable.

12. Details of the Bidder(s) (In case of the Bidder being a trading licensee):-

In case the Bidder is trading licensee, Agreement with the seller/generator shall be attached with the Bid.

13 Bid Validity:-

The validity period of offer of Bidder shall be till **31.03.2023.**

14 BEST's Rights:

BEST reserves its right to accept or reject any Offer whether fully or partially without assigning any reasons pursuant to this Bid. The Bidder on the other hand binds himself to sell power in part or whole at the option of the BEST.

15. Resolution of Dispute:-

Any dispute or differences arising under, out of, or in connection with this Bid document shall be subjected to exclusive jurisdiction of competent court at Mumbai only. In any event BEST shall not be responsible for any dispute between the Bidder (in case of bidder being the trading licensee) and the Generator.

16. Arbitration:

Subject to the statutory provisions for arbitration under the Electricity Act, 2003, all other differences or disputes between the parties arising out of or in connection with this Bid document shall be settled through Arbitration subject to the provisions of the Arbitration and Conciliation Act, 1996. The venue for Arbitration shall be at Mumbai. Notwithstanding any legal dispute, disagreement or difference, the parties here to, continue to perform the respective obligations under the terms of this agreement.

17. Condition Precedent:-

The Letter of Intent (LoI) is subject to approval, clearances and permissions from all authorities i.e. Maharashtra Electricity Regulatory Commission (MERC), RLDC/ SLDCs.

18. Acceptance of Offer:-

BEST reserves the right to reject any or all the Bids without assigning any reasons what so ever. It is also not binding on BEST to disclose any analysis report on offers. Once the acceptance of the offer is conveyed, the Bidder(s) would be bound to supply the power as per the contract. BEST reserves the right to enter into Letter of Intent (LoI) with one or more of the Suppliers.

****

Annexure-II

To be given on the official letter head of the Bidder

Acceptance of Terms and Conditions of Bid Document
(To be signed by the authorized person of the bidder)

We/I have carefully gone through the Bid Document No. ……………..…….. dated………….and satisfied ourselves/myself and hereby confirm that our/my offer strictly conforms to the requirements of the Bid Document and all the terms and conditions are acceptable to us.

Signature :-

Name :-

Status :-

Whether Authorized Yes/No

Power of Attorney of Bidding Company
Authorizing the signatory to sign the bid

Name & Seal of Bidding Company

Format of Covering Letter

(The covering letter should be on letter head of bidding company/ lead member of the bidding consortium)

Date……………………..

From………………………… (Insert Name and address of bidding company)
………………………….
Tel No :-
Fax:-
Email address :

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

Sub: Bid for Purchase of power by BEST on short term Basis i.e. for the period from……….. to……….through e-Tender & e-Reverse Auction process in response to Bid Document No. ……………. dated ………..

Dear Sir,

We, the undersigned, ………..(insert name of the bidder) having read, examined and understood in detail the Bid document for purchase of power by BEST on short term basis i.e. for the period from……….. to……….through E-tendering process hereby submit our bid.

a. We give unconditional acceptance to the Bid Document No…..………………dated ……………(insert date), attached thereto, issued by the BEST.
In token of our acceptance to the Bid Document, the same have been initiated by us and enclosed to the bid. We shall ensure provisions of the Bid Document shall be binding on us.

b. EMD:
We have enclosed the EMD of Rs……………….(insert amount), in the form of Bank Guarantee dated …….. drawn on ………………(insert name of Bank) and payable at Mumbai.
The offered quantum of power by us is ………….MW(insert total capacity offered).

c. We have submitted our financial bid strictly as per Bid Document without any deviations, conditions and without mentioning any assumptions or notes for the financial bid in the said format.

d. Acceptance:-

We hereby unconditionally and irrevocably agree and accept that the decision made by the BEST in respect of any matter regarding or arising out of the Bid shall be binding on us. We hereby expressly waive any and all claim in respect of Bid process.

We confirm that there are no litigations or disputes against us, which materially affect our ability to fulfill our obligations with regard to supply of power.

e. Contact person:

Details of contact person are furnished as under:
Name ………………………………
Designation………………………..
Company………………………….
Address…………………………….
Phone Nos …………………………
Fax Nos……………………………..
Email Address……………………….

f. It is confirm that our bid is consistent with all the requirements of submissions as stated in the Bid Document and subsequent communications from BEST.

g. The information submitted in our bid is complete, strictly as per the requirement stipulated in the Bid Document and is correct to the best of our knowledge and understanding. We would be solely responsible for any errors or omissions in our bid.

h. We confirm that all the terms and conditions of our Bid are valid for acceptance for a period of ………days from the bid deadline (i.e. till……..day of………2023).

i. We confirm that we have not taken any deviations so as to be deemed non responsive with respect to the provisions of this Bid Document.

Dated ……..day of………2023

Thanking You.

Your’s Faithfully,

(name , designation and signature of authorized person in whose name power of attorney/Board Resolution is issued by the Bidder)

Annexure-III

DRAFT FORMAT OF THE BANK GURANTEE FOR EMD

(The Bank Guarantee should be executed on a non-judicial stamp paper of appropriate value as per Stamp Act relevant to place of execution along with a Confirmatory Letter from the Regional office of the Bank concerned in enclosed format.)

To,
The General Manager,
The Brihanmumbai Electric Supply & Transport Undertaking,
BEST Bhavan, BEST Marg,
Post Box No. 192,
Mumbai- 400 001.

In consideration of ______________ (name of Bidder to be inserted) agreeing to undertake the obligations under the terms and conditions of Bid Document No:_____________ dated______ signed by________________________(name of bidder to be inserted) having its office at ________________ .The_________________ (Insert Guarantor Bank Name) having its registered office at __________________ hereinafter referred to as "Guarantor Bank" hereby agrees unequivocally, irrevocably and unconditionally to pay to BEST Undertaking having its office at BEST Bhavan, BEST Marg, Mumbai-400001 forthwith on demand in writing from the General Manager, BEST Undertaking or any Officer authorized by it in this behalf, any amount up to and not exceeding Rupees___________ Only with respect to the offered Capacity of______MW as per the terms and conditions of the Bid Document No. ________________dated_________.

This guarantee shall be valid and binding on the Guarantor Bank upto and including_____________________(Insert date of validity of EMD) and shall in no event not be terminable by notice or any change in the constitution of the Bank or the term of the Bid Document No._______________ dated_______ signed by__________ or by any other reasons whatsoever and our liability hereunder shall not be impaired or discharged by any extension of time or variations or alternations made, given, or agreed with or without our knowledge or consent, by or between parties to the respective agreement.

Our liability under this Guarantee is restricted to Rs._______________(Rs._________/-) only. Our Guarantee shall remain in force until _____________. BEST Undertaking shall be entitled to invoke this Guarantee up to _________________, by issuance of a written demand to invoke this guarantee.

The Guarantor Bank hereby expressly agrees that it shall not require any proof in addition to the written demand from BEST Undertaking, made in any format, raised at the above mentioned address of the Guarantor Bank, in order to make the said payment to BEST Undertaking.

The Guarantor Bank shall make payment hereunder on first demand without restriction or conditions and notwithstanding any objection by__________ (name of Bidder to be inserted). The Guarantor Bank shall not require BEST Undertaking to justify the invocation of this BANK GUARANTEE, nor shall the Guarantor Bank have any recourse against the Procurer(s) in respect of any payment made hereunder.

The Guarantor Bank represents that this BANK GUARANTEE has been established in such form and with such content that it is fully enforceable in accordance with its terms as against the Guarantor Bank in the manner provided herein.

This BANK GUARANTEE shall not be affected in any manner by reason of merger, amalgamation, restructuring, liquidation, winding up, dissolution or any other change in the constitution of the Guarantor Bank.

This BANK GUARANTEE shall be a primary obligation of the Guarantor Bank and accordingly BEST Undertaking shall not be obliged before enforcing this BANK GUARANTEE to take any action in any court or arbitral proceedings against_________ (name of Bidder to be inserted)to make any claim against or any demand on the ___________ (name of Bidder to be inserted)or to give any notice to or to enforce any security held by BEST Undertaking or to exercise, levy or enforce any distress, diligence or other process against__________(name of Bidder to be inserted).

The Guarantor Bank acknowledges that this BANK GUARANTEE is not personal to BEST Undertaking and may be assigned, in whole or in part, (whether absolutely or by way of security) by BEST Undertaking to any entity to whom it is entitled to assign its rights and obligations under the Bid document.

The Guarantor Bank hereby agrees and acknowledges that BEST Undertaking shall have a right to invoke this Bank Guarantee either in part or in full, as it may deem fit.

Notwithstanding anything contained hereinabove, our liability under this Guarantee is restricted to Rs._____________ (Rs ___________/-) only and it shall remain in force until______________.

This BANK GUARANTEE shall be extended from time to time for such period, as may be desired by______________ (name of Bidder to be inserted). We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only if BEST Undertaking serves upon us a written claim or demand.

This BANK GUARANTEE shall be interpreted in accordance with the laws of India and the courts at Mumbai shall have exclusive jurisdiction.

In witness whereof the Bank, through its authorized officer, has set its hand and stamp on his___________ day of____________ at__________.

Witness :-

(1) _____________________________ The Duly Constituted Attorney

(Signature)

______________________________ ____________________________

(Name of the witness) (Signature)

______________________________ ____________________________

(Address of the witness) (Name & Designation of the person)

For

____

(Name of the Bank)

(2) ________________________________

(Signature)

________________________________ _______________________________

(Name of the witness) (Name of the Bidder)

____

(Address of the witness)

The Bank and the said Messrs.
Witness: ________________________________

____

(Signature)

____

(Name of the witness)

____

(Address of the witness)

Bid Sheet

Select Event: BEST/Short/23-24/RA/11

Event Ref.: BEST/Short/23-24/RA/11

Period : 15/03/2023 12:00:00 To 15/03/2023 14:08:35

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
1	1 (Maharastra STU Periphery)	75.0(MW)	From 01.04.2023:09.00 to 30.04.2023:18.00	MANIKARAN POWER LIMITED/102094	50	10.25	15/03/2023 13:58	DB Power Limited, (2 x 600 MW) Village Baradarha,District Janjgir- Champa, Chhattisgarh (in WR)
				Tata Power Trading Company Limited/74212	50	10.7	15/03/2023 13:40	Prayagraj Power Generation Company Limited (PPGCL)
				Dhariwal Infrastructure Limited/84368	13	10.25	IPO 13/03/2023 14:26:02	DHARIWAL INFRASTRUCTURE LIMITED, UNIT I OF 300 MW CONNECTED TO MSETCL

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Dhariwal Infrastructure Limited/84368	13	10.25	IPO
2	MANIKARAN POWER LIMITED/102094	50	10.25	RA
3	Tata Power Trading Company Limited/74212	12	10.7	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
2	2 (Maharastra STU Periphery)	100.0(MW)	From 01.05.2023:09.00 to 31.05.2023:18.00	Dhariwal Infrastructure Limited/84368	13	9.98	15/03/2023 13:18	DHARIWAL INFRASTRUCTURE LIMITED, UNIT I OF 300 MW CONNECTED TO MSETCL
				MANIKARAN POWER LIMITED/102094	50	9.98	15/03/2023 13:58	DB Power Limited, (2 x 600 MW) Village Baradarha,District Janjgir- Champa, Chhattisgarh (in WR)
				Tata Power Trading Company Limited/74212	50	10.5	15/03/2023 13:40	Prayagraj Power Generation Company Limited (PPGCL)
				Tata Power Trading Company Limited /74187	10	10	IPO 13/03/2023 15:28:11	Govt. of Himachal Pradesh (GoHP) share of Power in Various Hydro Electric Power Plants located in Himachal Pradesh

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Dhariwal Infrastructure Limited/84368	13	9.98	RA
2	MANIKARAN POWER LIMITED/102094	50	9.98	RA
3	Tata Power Trading Company Limited /74187	10	10	IPO
4	Tata Power Trading Company Limited/74212	27	10.5	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
3	3 (Maharastra STU Periphery)	75.0(MW)	From 01.06.2023:09.00 to 30.06.2023:18.00	Dhariwal Infrastructure Limited/84368	**13**	**8.98**	15/03/2023 13:18	DHARIWAL INFRASTRUCTURE LIMITED, UNIT I OF 300 MW CONNECTED TO MSETCL
				MANIKARAN POWER LIMITED/102094	**50**	**8.98**	15/03/2023 13:59	DB Power Limited, (2 x 600 MW) Village Baradarha,District Janjgir- Champa, Chhattisgarh (in WR)
				Tata Power Trading Company Limited/74212	**50**	**10.5**	15/03/2023 13:41	Prayagraj Power Generation Company Limited (PPGCL)
				Tata Power Trading Company Limited /74187	**10**	**10**	IPO 13/03/2023 15:28:11	Govt. of Himachal Pradesh (GoHP) share of Power in Various Hydro Electric Power Plants located in Himachal Pradesh

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Dhariwal Infrastructure Limited/84368	13	8.98	RA
2	MANIKARAN POWER LIMITED/102094	50	8.98	RA
3	Tata Power Trading Company Limited /74187	10	10	IPO
4	Tata Power Trading Company Limited/74212	2	10.5	RA

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
4	4 (Maharastra STU Periphery)	37.0(MW)	From 01.10.2023:09.00 to 31.10.2023:18.00	Tata Power Trading Company Limited/74212	**37**	**10.5**	IPO 13/03/2023 15:20:54	Prayagraj Power Generation Company Limited (PPGCL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74212	37	10.5	IPO

Sl.No.	Item Name	Quantity (UOM):	Description	Bidder Ref. No.	Booking Quantity	Booking Amount	Booking Time	Source of power / details of generating station from where power is intended to be supplied
5	5 (Maharastra STU Periphery)	25.0(MW)	From 01.12.2023:09.00 to 31.12.2023:18.00	Tata Power Trading Company Limited/74212	**25**	**10.5**	IPO 13/03/2023 15:20:54	Prayagraj Power Generation Company Limited (PPGCL)

Bucket Filling

Sl.No.	Bidder Ref. No.	Quantity	Price	Event Type
1	Tata Power Trading Company Limited/74212	25	10.5	IPO

Reverse Auction Participated Bidders Details

Sl.No.	Bidder Ref. No.	mpany Nai	Contact Person	Email
1	Tata Power Trading Company Limited/74212	Tata Power Tra	SUMIT SACHDEV	tptclmarketing@tatapower.com
2	Dhariwal Infrastructure Limited/84368	Dhariwal Infras	PULAK NANDY	pulak.nandy@rp-sg.in
3	MANIKARAN POWER LIMITED/102094	MANIKARAN PC	PRAVIN LEE ABRAHAM	bilateral.del@manikaranpowerltd.in

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
World Trade Centre, Centre No.1, 13th Floor, Cuffe Parade, Mumbai 400005.
Tel. 022 22163964/65/69 Fax 22163976
Email: mercindia@merc.gov.in
Website: www.merc.gov.in

Case No 44 of 2023

Case of Brihanmumbai Electric Supply and Transport Undertaking seeking review of the Order passed by the Commission in Case No 37 of 2023 dated 31 March 2023.

Coram
Sanjay Kumar, Chairperson
I.M.Bohari, Member
Mukesh Khullar, Member

Brihanmumbai Electric Supply and Transport Undertaking: - Petitioner

Appearance
For Petitioner: - Dr. R.D.Patsute (Rep)

ORDER

Date: 28 April, 2023

1. Brihanmumbai Electric Supply and Transport Undertaking(**BEST**) has filed this Petition on 3 April, 2023 seeking review of the Order passed by the Commission in Case No 37 of 2023 dated 31 March, 2023 under Section 61 and 62 of Electricity Act, 2003 (EA, 2003) read with Regulation 28 of MERC (Transaction of Business and Fees and Charges) Regulations, 2022; Regulation 22 of MERC (Multi-Year Tariff) Regulations, 2019 and Ministry of Power's Guidelines dated 30 March, 2016 for short term procurement of power by Distribution Licensees.

2. **BEST's main prayers are as under:**

   a. *Hon'ble Commission may accord approval for quantum and price discovered as tabulated in Para 1.5 above through short term power purchase e-tender vide BEST/Short/23-24/ET/11 and BEST/Short/23-24/RA/11 as prayed in the amendment / additional submission made in Petition in Case No. 37/AP/2023;*

b. *Hon'ble Commission may accord approval for short term bilateral power purchase quantum of 285.44 MUs for the period from April,2023 to March,2024 as tabulated in Para 5.0 above at average tariff of Rs 8.21/kWh discovered through competitive bidding process on DEEP portal undertaken by BEST;*

c. *Hon'ble Commission may accord approval for additional power procurement from short term sources including power exchanges for optimization of power purchase cost and meeting any other shortfall at the average rate of Rs 8.21/kWh for FY 2023-24;*

3. **BEST in its Petition has stated as follows:**

3.1 BEST has filed Petition under Case No. 37/AP/2023 on 6 March, 2023 and sought approval for average rates discovered through short term bilateral power purchase tender dated 30 January, 2023 with average rate of power purchase as Rs 7.43 per unit for 199.74 MU. Further BEST also sought approval for power purchase through external offer from M/s Ideal Energy Projects Limited (IEPL) of 25 MW RTC power for April 2023 to June 2023 at Rs 7.85per unit for 54.60 MU.

3.2 BEST had invited new e-tender dated 10 March, 2023 on Discovery of Efficient Electricity Price (DEEP) bidding portal for bilateral power purchase quantum of 25 MW to 100 MW for time slots 09:00 to 18:00 hrs for the months of April 2023, May 2023, June 2023, October 2023 and December 2023 as the response for requisitioned bid quantum was not received for these months for day peak period of 09:00 hrs to 18:00 hrs. The result of the bidding process is summarized below:

Sr. No.	Contract Period	Slot / Time (Hrs.)	BEST's Bid Quantum	Successful Bidder	Source	Allotted Quantum in MW	Discovered Rate in Rs./ kWh
1	01-Apr-23 To 30-Apr-23	09:00 To 18:00	75	Dhariwal Infrastructure Limited (DIL)	Dhariwal Infrastructure Limited (DIL)	13	10.25
				Manikaran Power Limited (MPL)	DB Power Ltd, Chhattisgarh	50	10.25
				Tata Power Trading Company Limited (TPTCL)	Prayagraj Power Generation Company Ltd, Uttar Pradesh	12	10.70
2	01-May-23 To 31-May-23	09:00 To 18:00	100	Dhariwal Infrastructure Limited (DIL)	Dhariwal Infrastructure Limited (DIL)	13	9.98
				Manikaran Power Limited (MPL)	DB Power Ltd, Chhattisgarh	50	9.98
				Tata Power Trading Company Limited (TPTCL)	Govt.of Himachal Pradesh, Hydro	10	10.00
				Tata Power Trading Company Limited (TPTCL)	Prayagraj Power Generation Company Ltd, Uttar Pradesh	27	10.50
3	01-Jun-23 To 30-Jun-23	09:00 To 18:00	75	Dhariwal Infrastructure Limited (DIL)	Dhariwal Infrastructure Limited (DIL)	13	8.98

Sr. No.	Contract Period	Slot / Time (Hrs.)	BEST's Bid Quantum	Successful Bidder	Source	Allotted Quantum in MW	Discovered Rate in Rs./ kWh
				Manikaran Power Limited (MPL)	DB Power Ltd, Chhattisgarh	50	8.98
				Tata Power Trading Company Limited (TPTCL)	Govt.of Himachal Pradesh, Hydro	10	10.00
				Tata Power Trading Company Limited (TPTCL)	Prayagraj Power Generation Company Ltd, Uttar Pradesh	2	10.50
4	01-Oct-23 to 31-Oct-23	09:00 To 18:00	37	Tata Power Trading Company Limited (TPTCL)	Prayagraj Power Generation Company Ltd, Uttar Pradesh	37	10.50
5	01-Dec-23 To 31-Dec-23	09:00 To 18:00	25	Tata Power Trading Company Limited (TPTCL)	Prayagraj Power Generation Company Ltd, Uttar Pradesh	25	10.50

3.3 After considering discovered price and allocated quantity to successful bidders, the estimated average rate of power purchase cost for total **85.70 MU** for the months of April, 2023, May, 2023, June, 2023, October, 2023 and December, 2023 will be **Rs.10.02 per unit.**

3.4 Accordingly, LoI were issued to the successful bidders within the timeframe as specified in MoP Guidelines. After considering the short-term power purchase through both the e-tenders and external offer of M/s IEPL, the average rate along with the total cost and quantum for FY 2023-24 is tabulated as under:

Total power purchase through short-term bilateral sources in FY 2023-24		
Total Power purchase quantum	MUs	340.04
Estimated Power purchase cost	Rs. In Crs.	277.18
Avg. Rate of Power purchase	Rs./kWh	8.15

3.5 Accordingly, BEST made amendment / additional submission with revised prayers in the above petition in Case No. 37 of 2023 on 16 March, 2023.The revised prayers in said submission were as follows:

a. *To consider the present submission under the Petition in Case No. 37/AP/ 2023;*

b. *Hon'ble Commission may accord approval for short term power purchase quantum in replacement to the RE power which is not available for FY 2023-24.*

c. *Hon'ble Commission may accord approval for short term bilateral power purchase of 340.04 MUs quantum for the period from April'2023 to March'2024 as tabulated in Para 4.3 and 4.4 above at average tariff of Rs 8.15/KWh discovered through competitive bidding process on DEEP portal undertaken and through external offer received by BEST;*

d. *Hon'ble Commission may accord approval for additional power procurement from short term sources including power exchanges for optimization of power purchase cost and meeting any other shortfall at the average rate of Rs 8.15/kWh for FY 2023-24;*

3.6 The Commission held E-hearing on 23 March, 2023. During the hearing, BEST made the submissions of the Petition and requested the Commission to approve proposed short term power procurement. Based on the queries raised by the Commission during the E-hearing, BEST submitted its additional submission on 24 March, 2023.

3.7 Thereafter, the Commission has issued Order dated 31 March, 2023 in Case No. 37 of 2023 and IA 24 of 2023 in Case No 37 of 2023. In the said Order, the Commission noted that the proposed short term power procurement is within the total power procurement quantum approved in MYT Tariff Order. Further projected peak demand is not exceeding the previous year demand. Hence, the issue of transmission constraints will not arise for such short-term power procurement.

3.8 Further, the Commission noted that tariff discovered by BEST fulfils mandates and requirements for adoption as set out in Section 63 of the EA, 2003 and MYT Regulations, 2019. Accordingly, the Commission adopted Power Procurement with weighted average tariff of Rs 7.43 per unit and quantum for BEST undertaking for the period from April, 2023 to March, 2024 as per the tender vide tender no BEST/Short/22-23/ET/247 and BEST/Short/22-23/RA/237 floated on DEEP portal.

3.9 The Commission has rejected the request of BEST for procurement of RTC power from IEPL which was not part of bidding process. For fulfilling its power requirement, the commission directed to initiate fresh bidding process for which interested bidders along with IEPL can participate in the transparent bidding process as envisaged under the EA, 2003.

3.10 However, it is observed that the consideration of BEST's amendment / additional submission dated 16 March, 2023 along with the revised prayers is not duly reflected in the Order. Therefore, BEST is filing this Review Application as per the provisions under EA, 2003 and MERC (Transaction of Business and Fees and Charges) Regulations, 2022.

3.11 After considering both the short-term power purchase e-tenders and excluding the external offer from IEPL as directed by the Commission, the average rate along with the total cost and quantum for FY 2023-24 is tabulated as under:

Total power purchase through short-term bilateral sources in FY 2023-24		
Total Power purchase quantum	MU	285.44
Estimated Power purchase cost	Rs. In Crs.	234.32
Avg. Rate of Power purchase	Rs./kWh	8.21

3.12 In view of above it is requested to allow the review Petition and further requested to adopt the weighted average rate of Rs 8.21 per unit discovered through competitive bidding and approve the short-term power purchase from April 2023 to May 2024.

4. During the E-hearing held on 11 April, 2023, BEST has requested to adopt the rate of Rs 10.02 per unit discovered through the competitive bidding to meet anticipated shortfall in demand for the month of April, May and June, October and December, 2023 and approve the proposed short term power procurement. The Commission directed BEST to submit the cost effectiveness of the proposed power procurement in comparison with the power sources approved in the MTR Order in Case No 212 of 2022.

5. **BEST in its additional submission dated 11 April, 2023 has submitted as below:**

5.1 BEST has proposed to procure power from the various sources at the respective discovered rates for the months of April, May, June, October and December, 2023 in line with the short term competitive bidding guidelines of MoP.

5.2 The requirement of 85.70 MU at the rate of Rs.10.02 per unit is required to meet the peak power during the aforesaid months. The power requirement has been worked out by estimating the shortfall by considering all the contracted generation as approved in the MTR Order at its full capacity. The Power requirement for months of April-May-June and October, December 2023 is as shown in the following table:

Particulars	Apr 2023	May 2023	Jun 2023	Oct 2023	Dec 2023
Demand at G<>T level (in MW)	888	909	903	876	717
Total availability*****(in MW)	718	718	718	718	626
Shortfall(-) /Surplus (+) (in MW)	-170	-191	-185	-158	-91
00:00 to 24:00 Hrs, RTC (in MW)	50	50	50	50	0
09:00 to 18:00 Hrs (in MW)	75	100	75	100	75
Day Ahead basis (in MW) (Power Exchange)	**45**	**41**	**60**	**8**	**16**

* *Tied up capacity of TPC-G, Manikaran and Walwhan is utilized to its fullest.*

5.3 E-bidding process was conducted on DEEP Portal and only eligible traders/generators are allowed to participate on DEEP portal. This power is required to meet summer peak of the system. To avoid costly power from Power Exchange, to maintain grid security and to ensure reliability of power supply to Mumbai city, it is necessary to procure this power as proposed. Additional requirements will be met from the power exchanges as proposed.

Commission's Analysis and Ruling:

6. BEST has approached the Commission through the review Petition for combined power purchase of 285.44 MU at the weighted average rate of Rs 8.21 per unit discovered

through the competitive bidding carried out vide the tenders published in January, 2023 and March 2023 excluding the external tie up with IEPL.

7. Regulation 28 of MERC (Transaction of Business and Fees and Charges) Regulations, 2022 governing reviews specifies as follows:

"28. Review of decisions, directions, and orders:

(a) Any person aggrieved by a direction, decision or order of the Commission, from which (i) no appeal has been preferred or (ii) from which no appeal is allowed, may, upon the discovery of new and important matter or evidence which, after the exercise of due diligence, was not within his knowledge or could not be produced by him at the time when the direction, decision or order was passed or on account of some mistake or error apparent from the face of the record, or for any other sufficient reasons, may apply for a review of such order, within Forty-Five (45) days of the date of the direction, decision or order, as the case may be, to the Commission…."

Thus, the ambit of review is limited, it cannot be an appeal in disguise, and this Petition is required to be evaluated accordingly.

8. The Commission notes that while finalizing the impugned Order dated 31 March 2023 in Case No 37 of 2023, the revised submission by BEST dated 16 March 2023 through which it has requested adoption of tariff discovered vide tender dated 10 March 2023, was inadvertently not considered. Thus, there is an error apparent on the face of record. Accordingly, in subsequent paragraph, the Commission is considering such submission on its merits.

9. The Commission notes that out of short-term bilateral power purchase quantum of 285.44 MU for the period from April, 2023 to March, 2024, the Commission has already accorded its approval for 199.74 MU at weighted average tariff of Rs. 7.43 per unit vide impugned Order dated 31 March 2023. Therefore, in present proceeding, only issue that remains is adoption of weighted average tariff of Rs.10.02 per unit for 85.70 MU discovered under tender dated 10 March 2023

10. It is also important to note that on 31 March 2023, the Commission has issued MTR Order for BEST wherein based on details submitted by BEST and considering realistic market conditions, the Commission has approved following power purchase expenses to BEST for FY 2023-24:

Particulars	Quantum (MU)	Cost (Rs. Cr)	Rate (Rs/kWh)
Long term / Medium term sources			
TPC-G	3231.37	2293.36	7.10
Past Gap of TPC-G		(200.50)	
Walwhan Solar MH Ltd	31.59	27.04	8.56
Manikaran Power Ltd	746.64	324.76	4.35
Short Term Sources			
Solar Energy	430.43	210.91	4.90
Non-Solar Energy	506.01	247.95	4.90
New Contract RTC/Bilateral	198.58	147.54	7.43

Stand By Charges		94.03	
Past Period Pool Imbalance		61.97	
Intra State Transmission Charges		232.10	
MSLDC Charges		0.93	
Total	**5144.61**	**3440.08**	**6.69**

Considering above power purchase expenses approved for FY 2023-24, during the hearing held in this matter on 11 April 2023, the Commission directed BEST to submit cost effectiveness of short-term power purchase proposed in present Petition. In reply BEST submitted that it has projected the demand requirement considering all the resources approved in the MTR Order operating to its the full capacity and is still in deficit of power for meeting the anticipated peak demand during April to June, 2023; October, 2023 and December, 2023. BEST has submitted its demand supply requirement as follows:

Particulars	Apr 2023	May 2023	Jun 2023	Oct 2023	Dec 2023
Demand at G<>T level (in MW)	888	909	903	876	717
Total availability*****(in MW)	718	718	718	718	626
Shortfall(-) /Surplus (+) (in MW)	-170	-191	-185	-158	-91
00:00 to 24:00 Hrs, RTC (in MW)	50	50	50	50	0
09:00 to 18:00 Hrs (in MW)	75	100	75	100	75
Day Ahead basis (in MW) (Power Exchange)	**45**	**41**	**60**	**8**	**16**

**Tied up capacity of TPC-G, Manikaran and Walwhan is utilized to its fullest*

In this regard, the Commission notes that in above projections for availability, BEST has considered only long term contracted sources, whereas the Commission in MTR Order has also allowed short term power procurement from RE Sources and conventional sources. BEST can procure such short-term power from either competitive bidding under Section 63 of the EA 2003 as per competitive bidding guidelines notified by the Central Government or power procurement through power exchanges.

11. In present case, BEST has undertaken the short-term power procurement as per the competitive bidding guidelines of MoP dated 30 March, 2016 by floating the bid on DEEP portal on 10 March, 2023 for supply of 25 to 100 MW in the time slot of 0900 to 1800 Hrs for the period from April, 2023 to June, 2023, October, 2023 and December, 2023 The weighted average tariff discovered in bidding process is Rs 10.02 per unit.

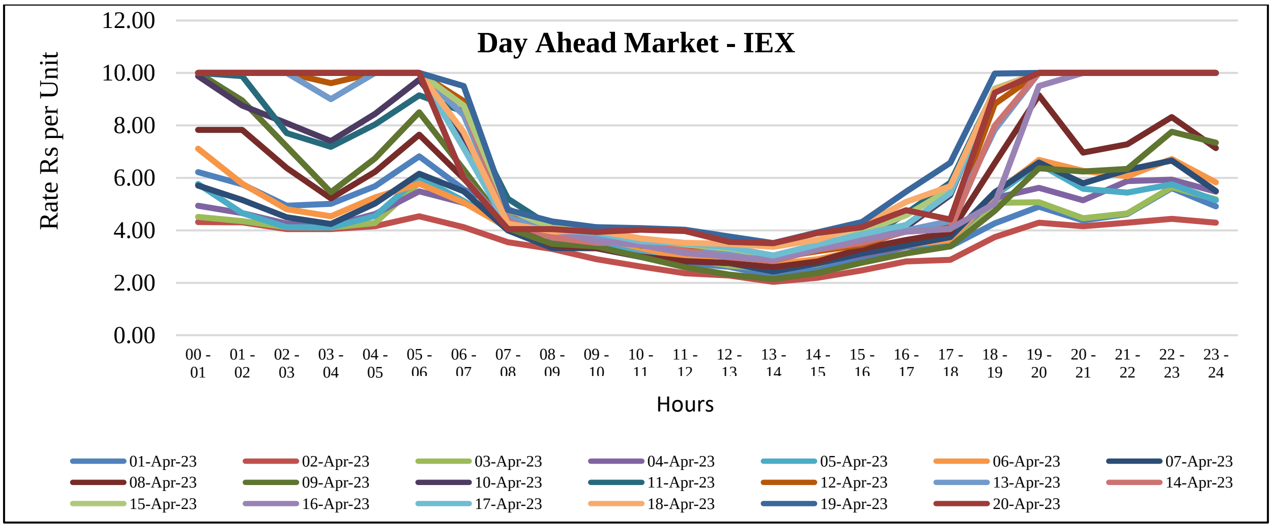
12. To assess the competitiveness of the tariff discovered by BEST in the present bidding the Commission has referred to recent discovered tariff on DEEP Portal by other Distribution Licensees in Maharashtra and same is tabulated below.

Sr No	Particulars	Period	Availability	Quantum of Power in MW	Discovered rate in Rs/ kWh
1	TPC-D	1.4.2023 to 30.04.2023	RTC	50 MW	14
		1.05.2023 to 31.05.2023	RTC	50 MW	14
		1.06.2023 to 15.06.2023	RTC	50 MW	14
2	BEST	10.4.2023 to 30.04.2023	RTC	25MW	8.64
		1.05.2023 to 31.05.2023	RTC	25 MW	8.64

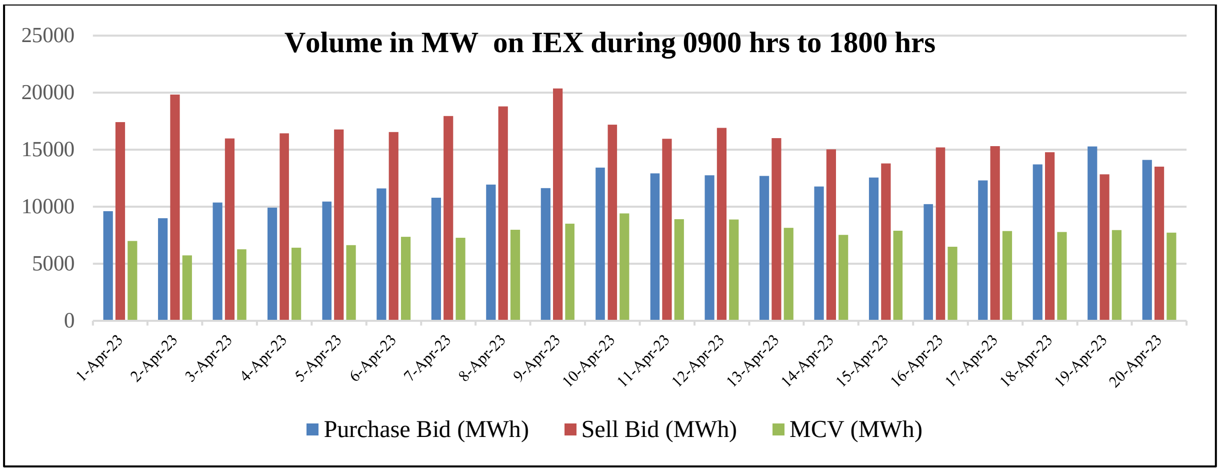
Sr No	Particulars	Period	Availability	Quantum of Power in MW	Discovered rate in Rs/ kWh
		1.06.2023 to 15.06.2023	RTC	25 MW	8.64
3	KRC DISCOMs	1.05.2023 to 31.05.2023	8:00 to 22:00 Hrs	8 MW	8.75
		1.06.2023 to 30.06.2023		5 MW	9.25
		1.08.2023 to 31.08.2023		4 MW	9
		1.09.2023 to 30.09.2023			
		1.10.2023 to 31.10.2023			

Considering above rates being discovered on DEEP Portal, rates discovered by BEST seems to be reflective of rate on DEEP Portal.

13. However, the Commission notes that before going ahead with such power procurement, BEST needs to consider other available option such as power exchanges for short term power procurement. The Commission notes that proposed power procurement in present case is for the period of 0900 hrs to 1800 hrs. The Commission notes that rate being discovered on Day Ahead Market of IEX is much lower than proposed power procurement rate of Rs 10.02 per unit. Following graph shows hourly Day Ahead rate on IEX for the period of 1 to 20 April 2023:



As can be seen from above, during period when BEST require power i.e. 0900 to 1800 hrs, rate on IEX is around Rs 3 to 4 per unit which is much lower than rate of Rs 10.02 per unit proposed in present case. The Commission has also analysed the quantum of power available during above time period on IEX in following graph.



As can be seen from the above, market clearance volume is lower than sell bid during 0900 hrs to 1800 hrs. Hence, it can be fairly assumed that BEST's demand of 25 to 100 MW can be served through IEX. There might be chances that generator quoting for sell of power are bidding above the market clearance rate and hence not getting cleared. But maximum rate they can quote is Rs 10 per unit which is ceiling imposed by CERC. Hence, if BEST opts for procurement of such power through power exchanges, probability of it getting at rate lower than Rs 10.02 per unit proposed in present Petition is much more.

14. Further, BEST stated that it has considered full capacity of its long term contracted sources before going for short term bidding. The Commission notes that one of BEST's contracted source i.e. TPC-G has two beneficiary i.e. BEST and TPC-D. Although, BEST is considering and utilising its full contracted capacity, there might be instances when other beneficiary is not using its allocation to fullest. In such circumstances, BEST may enter into appropriate arrangement with TPC-G/TPC-D to source the power from un-utilised capacity of TPC-G. BEST can sources additional power from TPC-G instead of procuring the short term power so as to optimise its power procurement expenses to that extent if the variable cost of TPC-G works out to be lower than Rs 10.02 per unit.

15. In view of above analysis, the Commission is not inclined to allow proposed power procurement in present Petition. But considering the fact that BEST has already started power flow under proposed contract for the month of April 2023 from 1 April 2023 and BEST would require some time to align its power procurement based on cheaper sources such as power exchanges / additional power from TPC-G, the Commission deems it fit to approve power procurement only for the month of April 2023. For remaining period, BEST shall first consider procuring power from cheaper sources such as IEX/ additional power from TPC-G and only after exhausting such option, BEST may go for power procurement at higher prices.

16. The Commission is aware that Section 63 of the EA, 2003 mandates the Commission to adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government. However,

it is important to note that Distribution Licensee needs to procure power from cheapest available sources. In present case it is clearly visible that cheaper option of procuring power through Power Exchange in available with BEST. Hence, the Commission in above para has directed BEST to evaluate possibility of procuring cheaper power from exchange / TPC-G additional capacity.

17. Hence, following Order:

<u>ORDER</u>

1. **Review in Case No 44 of 2023 is partly allowed.**

2. **Under Section 63 of the Electricity Act, 2003, the Commission adopts Short Term Power Procurement for April 2023 by as Brihanmumbai Electric Supply and Transport Undertaking as follows:**

Contract Period	Slot / Time (Hrs.)	BEST's Bid Quantum	Successful Bidder	Source	Allotted Quantum in MW	Discovered Rate in Rs./ kWh
01-Apr-23 To 30-Apr-23	09:00 To 18:00	75	Dhariwal Infrastructure Limited (DIL)	Dhariwal Infrastructure Limited (DIL)	13	10.25
			Manikaran Power Limited (MPL)	DB Power Ltd, Chhattisgarh	50	10.25
			Tata Power Trading Company Limited (TPTCL)	Prayagraj Power Generation Company Ltd, Uttar Pradesh	12	10.70

3. **For the remaining period, Brihanmumbai Electric Supply and Transport Undertaking, shall evaluate option of procuring cheaper power through sources such as power exchanges/ additional power from TPC-G before going for costly power procurement.**

Sd/-	Sd/-	Sd/-
(Mukesh Khullar)	**(I. B. Bohari)**	**(Sanjay Kumar)**
Member	**Member**	**Chairperson**

(Abhijit Deshpande)
Secretary

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Data Gap Sr. No.22: CAPEX and Capitalisation:

a. As regards Non-DPR schemes undertaken in FY 2022-23 and FY 2023-24, BEST should submit:

   i. Details of works carried out under Non-DPR schemes.

   ii. Justification that work carried out is capital in nature.

   iii. Cost-benefit-analysis of the capital expenditure.

Reply: a) As regards Non-DPR schemes undertaken in FY 2022-23 and FY 2023-24, BEST submit as follows:

Non DPR- Schemes executed during FY 2022-23:

(i) **Details of works:** - Installation & Commissioning of additional T/F and accessories at Pochkhanwala Road RSS along with the accessories.

Justification that work carried out is capital in nature: As per Capex Regulation, 2022, Clause No. 3.9 (a) the said work was done at Pochkhanwala Road RSS for releasing 10 MW Load at Whispering Height i.e. infrastructure is used for releasing new supply connection.

(ii) **Details of works:** - Installation of earthing was done at Marine Drive, Apollo, Malbar Hill, DBA & Lodha Crown RSS.

Justification that work carried out is capital in nature: The useful life of the Assets is already completed. As per Capex Regulation, 2022, Clause No. 3.9 (i) the said work was done at above mentioned RSS for improvement in quality of supply and reliability of distribution system.

(iii) **Details of works:** - Replacement of AFF system at Simplex Mill, Wadala, Raoli Hill, Pratiksha Nagar, Navy Nagar, G.T. Hospital, Elphinstone Mill and Dharavi RSS.

Justification that work carried out is capital in nature: The useful life of the Assets is already completed.As per Capex Regulation, 2022; Clause No. 3.9 (h) the said work was done at Simplex Mill, Wadala, Raoli Hill, Pratiksha Nagar, Navy Nagar, G.T. Hospital, Elphinstone Mill and Dharavi RSS under augmentation of transformers at existing Receiving Stations.

(iv) **Details of works:** - Installation of Control & Relay Panel (CARP) at Lodha Crown, Kussara & Mazgaon Dock RSS.

Justification that work carried out is capital in nature: The useful life of the Assets is already completed. As per Capex Regulation, 2022, Clause No. 3.9 (h) the said work was done at Lodha Crown, Kussara and Mazgaon Dock RSS under augmentation of transformers at existing Receiving Stations.

(v) **Details of works:** - Replacement of Battery & Battery Charger at Mazgaon Dock & Backbay RSS.

Justification that work carried out is capital in nature: The useful life of the Assets is already completed. As per Capex Regulation, 2022, Clause No. 3.9 (h) the said work was done at Mazgaon Dock & Backbay RSS under augmentation of transformers at existing Receiving Stations.

(vi) **Details of works:** -Replacement of old Conventional Energy Meters.

Justification that work carried out is capital in nature:

- FY 2021-22:- As per the ruling given by the commission in Case No.212 of 2022 dtd. 31.03.2023, Para 4.6.10, it is mentioned that *"BEST has claimed the capitalisation of Rs. 14.63 Crore in FY 2021-22 against which the DPR is yet to be approved and is in relation to implementation of Energy Meters. As per the past approach of the Commission, the capitalisation undertaken for the scheme which is yet to be approved is not allowed and accordingly, the Commission not considered the capitalisation of Rs. 14.63 Crore in FY 2021-22. BEST may seek approval for such capitalisation in next tariff Petition post seeking approval of the Commission for said DPR".*

  Vide Letter No. ESO/AGMES/EM DPR/2022-23/06 dated 31st January, 2023, DPR for 'Energy Meter' was submitted to the Hon'ble Commission. However, the Hon'ble Commission has returned back the said DPR stating that "After evaluation of the DPR it is observed that the cost of the proposal is below the stipulated limit of Rs.25 Cr as per Regulation 4.1 of Capex Regulation, 2022". Further directed "to consider the proposal under Non DPR Scheme as per Regulation, 4.2 of Capex Regulation, 2022 and may submit the proposal with justification at the time of next MYT Tariff Petition for pass through of the cost". A copy of Letter from MERC is attached herewith as ***Annexure****-B.*

- FY 2022-23: The useful life of the Assets is already completed. As per Capex Regulation, 2022, Clause No. 3.9 (n) (o), the replacement of old conventional meters with Static Meters work was done under "all metering schemes and Improvement in consumer services".

(vii) **Details of works:** - Installation of additional 33 kV GIS Bus Section at 110 kV DBA RSS in FY 2019-20.

Justification that work carried out is capital in nature: As per Capex Regulation, 2022, Clause No. 3.9 (h) the said work was done at 110 kV DBA RSS under augmentation of transformers at existing Receiving Stations.

As per the ruling given by the commission in Case No.212 of 2022 dtd. 31.03.2023, Para

3.6.11, it is mentioned that the Capitalisation amount of Rs. 4.37 Cr was disallowed stating that "the Capitalisation was not of that scheme i.e. BEST/FY18/02A, MERC Ref. No. MERC/CAPEX/2019-20/135 dated 10.05.2019". Now, the said capitalization amount towards Installation of additional 33 kV GIS Bus Section at 110 kV DBA RSS is considered in Non DPR Schemes in FY 2022-23.

(viii) **For Cost Benefit Analysis (CBA) of Non DPR Schemes,** kindly refer CBA Repot for FY 2022-23. ***Kindly refer Annexure-11***.

Non DPR- Schemes executed during FY 2023-24:

(i) **Details of works:** - Replacement of 11 kV Bus Section at Sitaladevi RSS.

Justification that work carried out is capital in nature: As per Capex Regulation, 2022, Clause No. 3.9 (h) the said work was done at Sitaladevi RSS under augmentation of transformers at existing Receiving Stations.

(ii) **Details of works:** - Replacement of AFF system at Raoli Hill , Worli Dairy, Colaba & Pochkhanwala Road RSS.

Justification that work carried out is capital in nature: The useful life of the Assets is already completed. As per Capex Regulation, 2022, Clause No. 3.9 (h) the said work was done at Raoli Hill , Worli Dairy, Colaba & Pochkhanwala Road RSS under augmentation of transformers at existing Receiving Stations.

(iii) **Details of works:** - Installation of earthing was done at Apollo, Malbar Hill, Cumballa Hill , Grant Road , Masjid, Love Grove, Mumbadevi, Sewree, Marine Drive & Pratiksha Nagar RSS.

Justification that work carried out is capital in nature: The useful life of the Assets is already completed. As per Capex Regulation, 2022, Clause No. 3.9 (i) the said work was done at above mentioned RSS for improvement in quality of supply and reliability of distribution system.

(iv) **Details of works:** - Replacement of Battery & Battery Charger at Esplanade, Sewree, Raoli Hill, Prabhadevi, Masjid, Lalbaug, Peninsula Land, Girgaum & Nariman Point RSS.

Justification that work carried out is capital in nature: The useful life of the Assets is already completed. As per Capex Regulation, 2022, Clause No. 3.9 (h) the said work was done at Esplanade, Sewree, Raoli Hill, Prabhadevi, Masjid, Lalbaug, Peninsula Land, and Girgaum & Nariman Point RSS under augmentation of transformers at existing Receiving Stations.

(v) **For Cost Benefit Analysis (CBA) of Non DPR Schemes,** kindly refer CBA Report for

FY 2023-24. ***Kindly refer Annexure-11.***

महाराष्ट्र विद्युत नियामक आयोग
Maharashtra Electricity Regulatory Commission

MERC/CAPEX/2023-24/0260

Date: 02 June, 2023

To,
The General Manager,
BEST Undertaking,
2nd Floor, BackbayVeej Bhavan
149/150, Gen J. Bhosale Marg,
Nariman Point, Mumbai 400 021.

Subject :-Returning Back DPR for Post Facto Approval of BEST for "Energy Meters" For FY 2021-22 and FY 2022-23

Sir,

This has reference to your submitted DPR of Energy Meter for FY **2021-22 and FY 2022-23** for Post Facto approval of the Commission. The said scheme has been evaluated with reference to the capex Regulations, 2022.

1. After evaluation of the DPR it is observed that, the cost of the proposal is below the stipulated limit of Rs 25 Cr as per Regulation 4.1 of Capex Regulations, 2022. Detail of evaluation of the proposal is attached as per Annexure A

2. Accordingly, I am directed to return the DPR back as it is not fulfilling the criteria as specified under Regulation 4.1 of the Capex Regulations, 2022

3. BEST may consider the proposal under non DPR Schemes as per Regulation 4.2 of Capex Regulations, 2022 and may submit the proposal with justification at the time of next MYT Tariff Petition for pass through of the cost.

4. BEST is directed to submit capex proposal of such schemes related to Universal Service Obligation at least one year in advance from proposed date of execution of scheme.

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director

Encl: Annexure "A"

Annexure – A

Sr.No.	Type of Meter	Unit Cost	FY 2021-21		FY 2022-23	
A-1	Energy Meters for New Connection	in Rs.	Qty. in Nos.	Amount Rs in lakh	Qty. in Nos.	Amount (in Rs. Lakh)
1	Single Phase Static Meter (10-60 A)	594.72	17670	105.09	15985	95.07
2	Three Phase Static Meter (10-60 A)	1949.01	4842	94.37	5065	98.72
3	Three Phase Static Meter (50-100 A)	2701	0	0.00	498	13.45
4	Three Phase Static Meter 5(6)A LVCTO	3925	0	0.00	389	15.27
A-2	**Energy Meters for Replacement**					
1	Single Phase Static Meter (10-60 A)	594.72	139330	828.62	68375	406.64
2	Three Phase Static Meter (10-60 A)	1949.01	17338	337.92	16019	312.21
3	Three Phase Static Meter (50-100 A)	2701	0	0.00	250	6.75
4	Three Phase Static Meter 5(6)A LVCTO	3925	0	0.00	250	9.81
	TOTAL A (A-1 + A-2)		**179180**	**1366.00**	**106831**	**957.9193**
B	**Net Meters (New Connection)**					
1	Single Phase Static Meter (10-60 A)	1947.00	0	0.00	0	0.00
2	Three Phase Static Meter (50-100 A)	4900.01	0	0.00	0	0.00
3	Three Phase Static Meter 5(6)A LVCTO	7800.00	0	0.00	0	0.00
4	Three Phase Static Meter -/5 A Volt CTPT Operated	9000.00	0	0.00	0	0.00
	TOTAL 'B'		**0**	**0.00**	**0**	**0.00**
C	**Instruments and Accessories**					
I-1	**LV Current Transformers –New Connection**					
1	LV CTs 150/5	3876.30	69	2.67	0	0.00
1A	LV CTs 150/5	5044.50	359	18.1098	193	9.74
2	LV CTs 200/5	5262.80	52	2.74	0	0.00
2A	LV CTs 200/5	6490.00	191	12.40	119	7.72
3	LV CTs 300/5	5262.80	53	2.79	0	0.00
3A	LV CTs 300/5	6490.00	208	13.50	109	7.07
4	LV CTs 600/5	7947.30	20	1.59	0	0.00
4A	LV CTs 600/5	10030.00	89	8.9267	45	4.51
5	LV CTs 1000/5	18880.00	0	0.0000	0	0.00
I-2	**LV Current Transformers –Replacement**					
1	LV CTs 150/5	5044.50	41	2.07	36	1.82

Sr.No.	Type of Meter	Unit Cost	FY 2021-21		FY 2022-23	
A-1	Energy Meters for New Connection	in Rs.	Qty. in Nos.	Amount Rs in lakh	Qty. in Nos.	Amount (in Rs. Lakh)
2	LV CTs 200/5	6490.00	9	0.58	9	0.58
3	LV CTs 300/5	6490.00	11	0.71	12	0.78
4	LV CTs 600/5	10030.0 0	11	1.10	6	0.60
5	LV CTs 1000/5	18880.0 0	0	0.0000	0	0.00
II-1	HV Current Transformers-New Connection					
1	HV CTs 30/5	6609.25	0	0.00	6	0.40
2	HV CTs 100/5 & 150/5	5528.25	0	0.00	9	0.50
3	HV CTs 300/5	5605.00	0	0.00	6	0.34
II-2	HV Current Transformers-Replacement					
1	HV CTs 30/5	6609.25	0	0.00	3	0.20
2	HV CTs 100/5 & 150/5	5528.25	0	0.00	6	0.33
3	HV CTs 300/5	5605.00	0	0.00	3	0.17
	TOTAL'C'		1113	67.19	562	34.76
D	Summation C Ts		New connection			
1	5+5/5	828.74	0	0.00	9	0.07
2	5+5+5+5/5	1158.98	0	0.00	3	0.03
	TOTAL 'D'		0	0.00	12	0.11
E	Meter Seals		FY 2020-21		FY 2021-22	
1	Polycarbonate	4.01	211480	8.48	211480	8.48
	TOTAO 'E'		211480	8.48	211480	8.48
F	Adaptor for LVCTO Meters	1239	85	1.05	30	0.37
	TOTAL 'A+B+C+D+E+F'			1442.7255		1001.6365
	Total Capital Cost in Crore			14.43		10.02
	Grand Total Capita Cost in Crore				24.44	

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080

Email ID : depro@bestundertaking.com

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

ESO/AGM(ES)/CEPL/ 260 /2024

DATE : 19 DEC 2024

The Secretary,
Maharashtra Electricity Regulatory Commission
13th floor, Centre No.1,
World Trade Centre, Cuffe Parade, Colaba
Mumbai 400 005

Sub: Submission of Cost Benefit Analysis (CBA) for FY 2022-23

Sir,

With reference to above subject, BEST is submitting herewith Cost Benefit Analysis (CBA) for FY 2022-23 for the Hon'ble Commission's consideration, please.

Thanking you,

Yours faithfully,

19/12/24

(S. D. Chougule)
Divisional Engineer
Planning (Material) Dept

BEST's Submission of COST BENEFIT REPORT FOR FY-2022-23

1.0 The details of Capital Expenditure incurred during FY 2022-23 are as follows.

Table 1: Details of proposed Capital Expenditure& Actual Capitalisation during FY 2022-23

Scheme No.	Project schemes	Capitalisation FY 2022-23 (Rs. Cr) (As per approved DPR)	Actual Capitalization FY 2022-23 (Rs. Cr)
DPR-I	New Receiving Station (110 kV &33-22/11 kV)	5.71	8.33
DPR-II	Revamping at existing RSS	31.69	20.74
	N-DPR Schemes- (New RSS/ Revamping at existing RSS)	-	15.46
DPR-III	New DSS Commissioning, Augmentation & alteration to existing DSS	29.95	35.67
DPR-IV	Extension of Dist. Network (laying of HV and LV lines)	49.24	57.01
DPR-V	SCADA	0.00	0.00
DPR VI	Energy Meters	0.00	0.00
Non-DPR Schemes	Energy Meter		15.65
	Business Process Automation	0.00	0.03
	Street lighting (lamps & cables)	0.00	6.69
	G.A. Expenses (Furniture, office equipment, Tools, Civil works, Motor works etc.)	0.00	20.91
	Total	**116.59**	**180.49**

For detail approved capitalisation refer, Annexure-A, Pg. No.3, 9, 15 and for actual capitalisation refer, Annexure-A, Page No.27**.**

2.0 Scheme -I: <u>New Receiving Substations (110 kV &33-22/11 kV)</u>

2.1 The projected capitalisation proposed during FY 2022-23 **Amt in Cr.**

Sr. No.	Scheme No. &work at RSS	MERC Approval No. & Date	Projected Capitalisation FY 2022-23
1	**BEST/FY21/01**: New RSS Commissioning of RSS	MERC/CAPEX/FY2020-21/ dated 16.07.2020	5.71
	Total		**5.71**

For projected capitalisation refer Annexure-A, Pg. No. 3.

2.1.1The Projected benefit on implementation of the above schemes (for new RSS):

Sr. No.	Scheme No. & work at RSS	MERC Approval No. & Date	Projected Cost Benefit for FY 2022-23 (Rs. In Crore)
1	**BEST/FY21/01**: Commissioning of New Receiving Substations	MERC/CAPEX/FY2020-21/ - dated 16.07.2020	1.63
	Total		**1.63**

Projected additional revenue realisation = 1.63 Cr, Refer Annexure-B, Pg. No.1

2.1.2 Calculations of RoE for FY 2022-23 (Case No. 212 of 2022 dtd.31.03.2023)

Return on Equity for FY2022-23= Rs.139.11 Cr) Refer ------- Annexure-B, Pg. No.9.

Distribution Loss = 4.18% ------- Annexure-B, Pg. No.7

Energy sale = 4537.98 Mus. ------- Annexure-B Pg. No.7

R0E per unit = $139.11 \times 10^7 / 4537.98 \times 10^6 = 0.306$

For calculation of RoE per unit, the values of RoE, DistributionLoss, Energy Sales are taken from the approved Copy of MERC Order Case No. Case No. 212 of 2022 dtd.31.03.2023 and same is enclosed as ***Annexure –B Page No. 2-9.***

2.1.3 Projected cost benefit as proposed in the DPR BEST/FY-21/01 due to commissioning of 16 MVA T/Fs at new RSS:

For calculation purpose it is assumed that in the first year of commissioning a new T/F shall be loaded to the extent of 20%, in the 2nd year at 30%, in the 3rd year at 40%, in the 4th year 50% and finally in the 5th year at about load factor i.e. 58.01% for FY 2022-23.

No. of units realized in FY 2022-23 = Load (MVA) *Load Factor* Power Factor* Incremental load*(1- Distribution Loss)* No. of hours per day * No. of days * 1000/10^6

= (16*0.40* 0.99 *(1-0.0418)* 24 * 365 * 1000 / 10^6

= 53.18 Mus.

RoE per unit = **0.306**

Additional Revenue allocated in FY 2022-23 = $26.59 \times 0.306 \times 10^6 / 10^7$

= 1.63 Cr.

2.2 The actual capitalisation accrued during FY2022-23 as against above projections:

Sr. No.	Scheme No. & work at RSS	MERC Approval No. & Date	Amount Capitalised in FY 2022-23 (Rs. In Crore)
1	**BEST/FY-16/01**: Commissioning of New Receiving Substations.	MERC/CAPEX/FY2016-17 dated 28.09.2016	8.24
2	**BEST/FY21/01**: Commissioning of New Receiving Substations	MERC/CAPEX/FY2020-21/ dated 16.07.2020	0.09
	Total		**8.33**

2.2.1 Actual benefits achieved: The actual benefits achieved during the FY 2022-23 due to commissioning of 1X16 MVA Power Transformer at Dosti Acres RSS under New RSS is given in the following Table.

Amount in Crore

Name of RSS	Date of Commissioning	Days of Operation	Load in MVA	Energy Units Realised (MUs)	RoE	Revenue Realised
Dosti Acres	28.03.2023	3	4.8	0.20	0.31	0.01

Calculations of RoE for FY 2022-23 (Case No.212 of 2022 dtd. 31.03.2023)

Return on Equity for FY2022-23= Rs.139.11 Cr) ***Refer Annexure-B, Pg. No.9.***

Actual Distribution Loss = 4.18% ***Refer Annexure-B, Page No.10.***

Actual Energy sale = 4483.32 Mus. **Refer, *Annexure-B Pg. No.10.***

R0E per unit = 139.11 x 10^7 / 4483.32 x 10^6 = 0.31

No. of units realized in FY 2022-23 = Load (MVA) *Load Factor* Power Factor* Incremental load*(1- Distribution Loss)* No. of hours per day * No. of days * 1000/10^6

= 4.8*0.6004* 0.99 * (1-0.0418)* 24 * 3 * 1000 / 10^6

= **0.20 MUs.**

RoE per unit = 0.31

Additional Revenue allocated in FY 2022-23 = 0.20 x 0.31 x 10^6 / 10^7 = **0.01** Cr.

Wherein Capacity increased = 16 MVA, Load Factor = 60.04 %, Distribution Loss=4.18%.

The projected Additional Revenue realisation = Rs.0.01 Crore

For calculation of RoE per unit, the values of RoE are taken from the approved Copy of MERC Order Case No. Case No.212 of 2022 dtd.31.03.2023 and Distribution Loss, Energy Sales are taken from bulletin data and same is enclosed as **Annexure –A.**

3.0 Scheme -II: Augmentation / Replacement at existing Receiving Sub Stations

3.1 Projected capacity addition and commissioning schedule during FY 2022-23 as proposed in the DPR Scheme No. BEST/FY-20/02 & BEST/FY-21/02:

Sr. No.	**Scheme No. and works at RSS**	**Existing Capacity (in MVA)**	**Proposed Capacity (in MVA)**	**Added Capacity FY 2022-23 (in MVA)**
1	**BEST/FY-20/02**: Revamping of Existing RSS	0.00	0.00	0.00
2	**BEST/FY-21/02**: Revamping of Existing RSS	0.00	6	6
	Total (in MVA)	**0.00**	**6**	**6**

Projected capitalisation as per approved DPRs shall be as given in the following table:

Sr. No.	Scheme No. & work at RSS	MERC Approval No. With Date	Amount capitalised (Rs. Crore)
1	Scheme No. BEST/FY-20/02: Revamping of existing RSS	MERC/CAPEX/2020-21/553 dt.15.12.2021	2.32
2	**Scheme No. BEST/FY-21/02**: Revamping of existing RSS	MERC/CAPEX/2022-23/0556 dt.14.11.2022	29.37
	Total amount to be Capitalised		**31.69**

Annexure-A, Pg. No. 9 & 15.

3.1.1 Calculations of RoE for FY 2022-23 (Case No.212 of 2022 dtd.31.03.2023)

Return on Equity for FY2021-22 = Rs.139.11 Crs — Refer Annexure-B, Pg. No.9.

Distribution Loss = 4.18% — Refer Annexure-B, Pg. No.7.

Energy sale = 4550.60 Mus. — Refer Annexure-B Pg. No. 7.

R0E per unit = 139.11 X 10^7 / 4537.98 X 10^{6} = 0.306

For calculation of RoE per unit, the values of RoE, Distribution Loss and Energy Sales are taken from the approved Copy of MERC Order Case No. Case No.212 of 2022 dtd.31.03.2023 and same is enclosed as **Annexure –B, Page No. 2-9.**

3.1.2 Projected cost benefit as proposed in the DPR Scheme No. BEST/FY-20/02 and BEST/FY-21/02 due to augmentation/replacement of T/Fs at existing RSS:

For calculation purpose it is assumed that in the first year of commissioning a additional T/Fs at RSS shall be loaded to the extent of 20%, in the 2nd year at 30%, in the 3rd year at 40%, in the 4th year 50% and finally in the 5th year at about load factor i.e. 60.04%.

Further to this, it is assumed that additional 16 MVA T/Fs to be installed at existing RSS shall be loaded to the extent of 20% of added capacity in first year, in the 2nd year at 30%, in the 3rd year at 40%, in the 4th year 50% and finally in the 5th year at about load factor i.e.60.04%.

Nos. of projected Units to be realised in FY2022-23 shall be as follows:

= Load * Power Factor * Incremental load * No. of hours per day * No. of days * (1- Distribution Losses)
=(6*0.99*20%*24*365*1000*(1-0.0418))/10^6
= 9.97 Mus

RoE per unit = 0.306
Additional Revenue allocated in FY 2022-23 = 9.97 X 0.306 X 10^6 / 10^7
= 0.31 Cr (kindly refer Annexure-B, Pg. No. 11.

Wherein Capacity increased = 6 MVA, Incremental loading =20%, Distribution Loss=4.18%.

The projected Additional Revenue realisation = Rs.0.82 Crore.

3.2 The actual capitalisation accrued during the FY2022-23 as against the above projections:

Sr. No.	Scheme No. and works at RSS	Capacity addition (MVA)	MERC Approval No. & Date	Amount capitalised (Rs. Crs.)
1.	**BEST/FY-16/02** 1) Earthing work at Mazgaon and Mumbadevi RSS, 2) Inst. of 33 kV sw/gr at Sion Fort RSS. 3) AFF at Girgaum, Masjid and Nair Hospital RSS.	-	MERC /TECK-V/ CAP / DPR /20122013 /02688 dated 22.02.2013	2.74
2.	**BEST/FY-17/02** 1) Inst. Of T/F, 33 KV & 11 KV Sw/gr, AFF and CARP at PMGP. 2) Inst. Of 11 KV sw/gr. At Sion Fort RSS. 3) Battery at Esplanade RSS. 4) AFF at Nariman Point RSS. 5) Cable laying for Kingsway and Prabhadevi RSS.	-	MERC / CAPEX/ 2017-18 / 4706 dated 16.11.2017	11.38
3.	**BEST/FY-18/02** 1) Earthing at Prabhadevi , G.T. Hospital & Ballard Estate RSS. 2) Installation of 33 kv switchgear at Sewree & G.T. Hospital RSS. 3) Inst. Of Battery/ Charger at Tardeo, Lalbaug, Peninsula Land & Sion Fort RSS.	-	MERC /CAPEX/ 2017-18/4706 dated 16.11.2017	1.53
4.	**BEST/FY-20/02** 1) Installation of addnl. T/F, 11 kV sw.gr., AFF & Earthing at Kingsway RSS. 2) Earthing at Nepean Sea , Colaba RSS 3) Battery &/battery charger at Nariman Point RSS. 4) Installation of 11 kV Sw.Gr	16	MERC/CAPEX/2020-21/553 dated 15.12.2021	3.98

	at Prabhadevi & Kingsway RSS. 5) Installation of AFF at Byculla , Kingsway, Hutatma Chowk RSS 6) Cable diversion of Nepensea RSS			
5.	**BEST/FY-21/02** 1) Div. & Replacement 33 kV cable for DBA ---> Marathon Futurex .2) 33 kv Cable doiversion for Raoli Hill, Lodha Crown , Sion Fort, Pratiksha Nagar RSS. 3) Cable diversion at T.H.Kataria Marg and Chinchpokli Rly. Station.	0	MERC/CAPEX/2022-23/0556 dated 14.11.2022	1.11
	Total in Crores	**16**		**20.74**

Refer Annexure-A, Page No.27 (Sr. No. 3 to 9.

3.3 Actual Benefits achieved during FY 2022-23:

The actual cost benefit realised due to augmentation / replacement of Power Transformers at following places:

NAME OF RSS	Year of Commissioning	Date of commissioning	Days of operation	Load (MVA)	Energy Units realized MUs.	RoE	Revenue realized (Rs. Cr)
Kingsway T/F-4	2022	27.05.2022	308	3.2	13.47	0.31	0.42
TOTAL				**3.2**	**13.47**	**0.31**	**0.42**

Revenue Realized = (units)*ROE/Unit for FY 2022-23

ROE/Unit = $139.11*10^7 /4483.32* 10^{6} =$ **0.31**

For Kingsway RSS Tr. No.4

Units realized in MU =Load (MVA)*Load Factor*P.F. *(1- Dist. loss)*24*days of operation*1000/10^6

$=3.2*0.6004*0.99*(1-0.0418)*24*308*1000/ 10^6 = 13.47$ Mus

Additional Revenue allocated in FY 2021-22 = $13.47 \times 0.31 \times 10^6 /10^7 = 0.42$ C.

Actual Benefits of Rs. 0.42 Cr is achieved as against projected revenue realisation of Rs.0.82 Cr during FY 2022-23.

4.0 Capitalisation occurred during FY 2022-23 as against Non-DPR Schemes:

Sr. No.	Non-DPR Scheme work	Capacity addition (MVA)	Amount capitalised (Rs. Cr.)
1.	1) Installation & Commissioning of additional T/F and accessories at Pochkhanwala Road RSS 2) Installation of earthing was done at Marine Drive, Apollo, Malbar Hill, DBA & Lodha Crown RSS 3) Replacement of AFF system at Simplex Mill, Wadala, Raoli Hill, Pratiksha Nagar, Navy Nagar, G.T. Hospital, Elphinstone Mill and Dharavi RSS 4) Installation of Control & Relay Panel (CARP) at Lodha Crown, Kussara & Mazgaon Dock RSS 5) Replacement of Battery & Battery Charger at Mazgaon Dock & Backbay RSS 6) Installation of additional 33 kV GIS Bus Section at 110 kV DBA RSS in FY 2019-20.	16	15.46
	Total in Crs	**16**	**15.46**

Refer A, Page No. 24 (Sr. No. 17).

4.1 <u>The actual cost benefit realised due to addition of Power Transformers at following places:</u>

NAME OF RSS	Year of Commissioning	Date of commissioning	Days of operation	Load (MVA)	Energy Units realized MUs.	RoE	Revenue realized (Rs. Cr)
Pochkhanwala T/F -2	2022	05.04.2022	360	3.2	15.75	0.31	0.49
TOTAL				**3.2**	**15.57**	**0.31**	**0.49**

Revenue Realized = (units)*ROE/Unit for FY 2022-23

ROE/Unit = $139.11*10^7 /4483.32* 10^{6} =$ **0.31**

<u>For Pochkhanwala RSS Tr. No.2</u>

Units realized in MU =Load (MVA)*Load Factor*P.F. *(1- Dist. loss)*24*days of operation*1000/10^6

$=3.2*0.6004*0.99*(1-0.0418)*24*360*1000/ 10^6 =$ **15.75** Mus

Additional Revenue allocated in FY 2021-22 = $15.75 \times 0.31 \times 10^6 /10^7 =$ **0.49 Cr.**

Actual Benefits of Rs. 0.49 Crore is achieved as against NDPR during FY 2022-23.

5.0 Scheme -III: <u>New Distribution Substation Commissioning, Augmentation & Alteration to existing DSS</u>

5.1 Projected capitalisation proposed during FY 2022-23 as against DPR Scheme CodeNo. BEST/FY21/03

PARTICULARS	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Capex for the scheme, Rs. in Cr. (40 DSS in each year)	**30.20**	**29.95**	**29.95**	**29.95**	**29.95**
Capacity proposed to be installed (in MVA)	49.205	50.20	51.80	53.765	55.755
Total Transformer Nos.	68	70	72	74	77
Amount proposed to be capitalised (in Rs. Crore)	**30.20**	**29.95**	**29.95**	**29.95**	**29.95**

Refer Annexure-A, Page No.21. For detail MVA Capacity kindly refers Annexure-C, Pg. No.1.

5.1.1 During the FY 2022-23, the proposed distribution transformer capacity addition was as follows:

1) **Capacity addition by commissioning of New DSS:** During the year, it was proposed to commission 42 nos. of new DSS, having 42 nos. of DTs of capacities 630 kVA (22 Nos.), 995 kVA (13 Nos.) & 1600 kVA (7 Nos.) aggregating to total capacity addition as 38 MVA (Kindly refer Annexure-C, Page No.1).

2) **Capacity addition by Tr. Replacement**

During the year it was proposed to replace 1 No. of 400 KVA DT with 630 KVA DT leading to a capacity addition of 230 KVA (0.230 MVA) per transformer and 0.23 MVA in total, 20 Nos. of 630 KVA DTs with 995 KVA DTs leading to a capacity addition of 365 KVA (0.365 MVA) per DT and 7.30 MVA in total, 5 Nos. of 995 KVA DTs with 1600 KVA DTs leading to a capacity addition of 605 KVA (0.605 MVA) per DT and 3.025 MVA in total. Due to 26 Nos. of DTs replacement with higher capacity, total capacity addition will be 10.56 MVA (Kindly refer Annexure-C, Page No.1).

3) Capacity addition by Additional transformer

During the year, it was proposed to install 2 Nos. of additional DTs of 630 KVA leading to a total capacity addition of 1.26 MVA and 2 Nos. of additional DTs of 995 KVA leading to a total capacity addition of 1.99 MVA. Due to installation 4 Nos. of DTs total capacity addition will be 3.25 MVA (Kindly refer Annexure-C, Page No.1).

During the year, total capacity addition to the system by augmentation work would be the sum of capacity addition by commissioning new DSS and replacement/ addition of DTs

= 38 MVA + 10.56 MVA + 3.25 MVA

= 51.81 MVA

The projected capacity addition during FY 2022-23 = 51.81 MVA

No. of units realised = load (MVA)*Load Factor*Power Factor*(1-loss)*24*365*1000/10^6
= 51.81 *0.20*0.99 *(1-0.0418)*24*365*1000/10^6
= 86.11 Mus.

Projected no. of units realised due to capacity addition: 86.11 Mus.
RoE per unit for FY 2022-23 =$139.11*10^7/4537.98*10^6$ = 0.306

Revenue Realised = Units * RoE per unit
= $86.11*10^6*0.306/10^7$
= 2.63 Cr

During the FY 2022-23, projected cost benefit was Rs. 2.63 Cr as against DPR Scheme BESTFY21/03.

5.2 The projected capitalisation accrued during FY 2022-23 as against the above projections:

Sr. No.	No. of DSS	DPR submission to MERC (ref. No.)	Amount capitalised (Rs. Crore)
1	New DSS (40 Nos.)	Scheme No. BEST/FY-21/03	29.95
	Total cost		**29.95**

Refer Annexure-A, Page. No.19

5.2.1 The actual capacity addition during FY 2022-23 as against the above projections is as follows:

1) Actual Capacity additions and load by new DSS commissioning(Annexure-C, Page No.1)

In FY 2022-23, total 36 Nos. of New DSS are commissioned. A list of 36 Nos. of DSS commissioned in 2022-23 with details of installed capacity is enclosed as Annexure-C, *Pg. No.2 (Table-A).*

An actual Capacity addition due to commissioning of new 36 Nos. of DSS is (630kVA -25 Nos., 995 kVA- 17 Nos.& 1600 – 3 Nos.) 34.215 MVA and load is 6.843 MVA (assuming 20% loading)**.**

2) **Actual Capacity addition by DT Replacementwith higher capacity (*Annexure- C*) (*refer Pg. No. 2, Table-B*)**.

a) 1 Nos. of 400 kVA DTs is replaced with 630 kVA DT leading to a capacity addition of 230 KVA (0.230 MVA) and 0.23 MVA in total.

b) 6 Nos. of 630 kVA DTs are replaced with higher capacity. Out of 6 nos. of 630 KVA DTs, 5 no. of DT replaced with 995 kVA and balance one DT replaced with 1600 kVA leading to a capacity addition of 365 KVA (0.365 MVA) & 970 kVA (0.970 MVA) per DT and 2.795 MVA in total.

c) 2 No. of each 995 kVA are Replacement with 1600 kVA DT leading to a capacity addition of 605 KVA (0.605 MVA) per DT and 1.210 MVA in total.

Actual Capacity addition by replacement of 9 nos. of DTs with higher capacity DTs leading to a capacity addition of **4.235 MVA** in total.

3) **Actual Capacity addition by Additional transformer (Annexure-C, Table-D, Page No. 2)**.

1 Nos. of each 630 kVA, 995 kVA & 1600 kVA additional DTs are installed during F.Y. 2022-23 and results 3.23 MVA capacity additions in total.

Further to this, due to R&M, 2X630 kVA DT are replaced with 995 kVA DT's, leading to net capacity addition as 0.73 MVA.

Thus, total capacity addition due to additional DT and DT replaced under R&M is **3.96 MVA**

The actual total capacity addition to the system by augmentation work would be the sum of capacity addition by commissioning new DSS and replacement/ addition of transformers
= 34.215 MVA +4.235 +3.96 MVA
= 42.41 MVA
Load due to this capacity addition is 8.482 MVA (assuming 20% loading of 42.41 MVA)

5.2.2 The no. units realised due to capacity addition due to commissioning of new Distribution Sub-station (DSS) &Augmentation, alteration to existing DSS are as follows:

No. of units realised = load (MVA)*Load Factor*Power Factor*(1-loss)*24*365*1000
= (42.41) *0.6004*0.99 *20%*(1-0.0418)*24*365*1000/10^6
= 42.32 Mus.

Formula & Sample calculation:

As per case 212 of 2022, ROE (apprd. By MERC for FY2022-23) =139.11 Cr (***Refer Annex-B, Pg. No.95***).

Actual Unit's sales during FY2022-23 are 4483.32 Mus as against MERC approved **4537.98 Mus** ***(Refer Annexure- B, Page No.10 & 7).***

RoE per unit for FY 2022-23 =$139.11*10^7$ / $4483.32 *10^6$ = 0.306

Revenue Realised = Units * RoE per unit

= $42.32 *10^6 *0.306/10^7$

= 1.29 ***Cr.***

Actual Benefits of Rs. 1.29 Cr is achieved as against projected revenue realisation of Rs. 2.63 Cr during FY 2022-23.

6.0 Scheme -IV: Extension of Distribution Network (laying HV/LV Lines)

6.1 Projected phasing of capitalisation in the Scheme BEST FY21/04

PARTICULARS (Amt. In Crores)	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Capex for the scheme	49.24	**49.24**	49.24	49.24	49.24
Amount proposed to be capitalised	49.24	**49.24**	49.24	49.24	49.24

Refer Annexure-A, Page No. 24.

6.1.1 Projected capitalisation proposed during FY 2022-23 (DPR Scheme Code No. BEST/FY21/04), (*Annexure-A, Page No. 26)*

SR. No.	PARTICULARS OF EQUIPMENTS	Km/ Nos.	Amount (Rs. Crore)
A	Laying of HV cable	25.00	6.41
B	Laying of LV cable	56.00	11.39
C	RI Charges	24.27	18.71
D	Installation of new pillars	135	1.28
E	Laying of service cables & associated equipments	40	11.45
	Total		**49.24**

Refer Annexure-A, Page No. 26.

6.1.2 Computation of revenue from additional sales

Particulars	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Cumulative capacity commissioned (MVA)	49.21	99.41	**151.21**	204.97	260.73
Incremental Loading (%)	20%	30%	**40%**	50%	58.01%
Distribution losses (%)	4.18%	4.18%	**4.18%**	4.18%	4.18%
System Power factor	0.9822	0.9822	**0.9822**	0.9822	0.9822
Additional sales (MU)	81.14	204.98	**371.86**	585.18	838.04
ROE per Unit (Rs/unit)	0.279	0.278	**0.277**	0.277	0.276
Total Revenue (Rs. Crore)	2.26	5.71	**10.32**	16.18	23.09

***For Capacity addition, refer Para 5.1.* Projected cost benefit during FY 2022-23.**

Actual Benefits of Rs. 10.32 Cr is achieved as against above scheme No. BEST/FY21/04 (Kindly refer above table)

6.2 The actual capitalisation accrued during FY 2022-23 as against the above projections.

Sr. No.	Particulars of Equipments	DPR submission to MERC (ref. No.)	Amount capitalised (Rs. Crore)
A	**Scheme No. BEST/FY-21/04**		
1	Laying of HV cable (35.33 km)	MERC/CAPEX/2020-21/- dated 22.06.2020	5.31
2	Laying of LV cable (102.85 km)		16.82
3	Installation of ADPs (458 nos.)		2.68
4	Laying of service cables (65.97 km)		11.56
5	R.I. Charges		20.52

Sr. No.	Particulars of Equipments	DPR submission to MERC (ref. No.)	Amount capitalised (Rs. Crore)
6	Material Transport Charges		0.12
	TOTAL		**57.01**

During FY 2022-23, for extension of distribution network, Rs. 57.01 Cr actual capitalisations are accrued as against the projected capitalisation of Rs. 49.24 Cr.

7.0 Scheme-6 : Energy Meters

During FY 2022-23 there was no approved DPR for Energy Metres.

However Scheme No. BEST/FY 23/06 was put up for approval of Hon'ble Commission, same was rejected by the commission vide Dtd.

Due to rejection of the said DPR the cost incurred in respect of the DPR is considered as Non-DPR.

7.2 The Actual cost benefit realised due to addition of Energy Meters:

7.1 Capitalisation occurred during FY 2022-23 as against Non-DPR :

Sr. No.	DPR scheme ref. no.	Amount capitalised in FY 2022-23 (Rs. Crore)
1	Non -DPR	**1.02**
	Total Amount Capitalised	**1.02**

Refer Annexure-A, Pg. No. 27 (Sr. No.16).

REPLACEMENT OF CONVENTIONAL ENERGY METERS BY STATIC METERS

Total 10000 Nos. of Single Phase mechanical (conventional) meters are replaced by electronic meters during FY 2022-23

A. Total single phase meters replaced in FY 2022-23 = 10000

B. Average Consumption per Meter per Month (In Units) = 200

C. Average Consumption per Meter per Year (In Units) = 2400

Considering 4% slowness on average as meters are more than 15 years in service.

D. Units lost by single phase meters per year = (A x C x 0.04/100000) (in Lakh)

= (10000 x 2400 x 0.04) / 100000 = 9.6

Additional Revenue realized (in Lakh Rs.)(D x 7.11)*=9.6 x 7.11= 68.26

* Considering average tariff rate of residential consumers =Rs.7.11/ kwh (kindly refer Annexure-B, Page No.12)

Additional Revenue realized in FY 2022-23 = Rs. (D x 7.11) Cr = 0.68 Cr.

During FY 2022-23, actual benefit of Rs. 0.68 Cr is achieved.

The benefits achieved due to execution of this scheme are

i. Attained reliable and accurate measurement of energy.

ii. Provided reliable and improved service to the consumers

8.0 COST BENEFIT OF OVERALL SYSTEM

For all incremental sales to be realized, the RSS would require simultaneous commissioning of Distribution Sub stations, cabling and augmentation of existing infrastructure. We assume that the benefit from adding these components is in the same proportion as the current Capital Expenditure proposed towards the total system expansion and augmentation. This includes expenditure proposed in Project Schemes I (New RSS), II (Revamping of existing RSS), Non-DPR, III (New DSS & revamping of Existing DSS), IV (Strengthening of HV LV network) and V (Energy Meter) amounting to Rs. 180.49 Cr it includes capital expenditure towards Non-DPR Schemes, Revamping of RSS, BPA, Street Lighting & General Administration.

Therefore the overall cost benefit due to Strengthening of Network due to execution of work under schemes I, II, III, IV & Non-DPR are calculated as follows.

= (Additional Units realised in MUs due to Scheme I, II Non-DPR)*(RoE/Unit)*10^6*/10^7
Revenue due to Scheme VI

Additional units realised due to Commissioning of 1 No. of T/F in New RSS = 0.20 Mus
Additional units realised due to Augmentation / replacement of Power transformers = 13.47 Mus
Additional units realised due to Non-DPR Scheme 15.75 Mus
Additional units realised due to New DSS Schemes= 42.32 Mus

RoE per Unit =0.306
Overall Cost Benefit = ((((0.20+13.47+15.75+42.32)*0.306*10^6))+0.68)/10^7
= (71.74*0.306*10^6) /10^7 + 0.68
= (2.195+0.68) Cr
= 2.875 Cr.

8.1 We have apportioned the cost benefit of Rs. 2.22 Crores to 5 schemes in proportion of the Capex of each scheme as follows:

All amounts in Cr.

NAME OF SCHEME	CAPEX	SCHEME CODE	% OF TOTAL CAPEX	BENIFITS PROJECTED IN DPR	BENEFITS ACHIEVED
New Receiving Substation of 110 kV & 33-22kV/11 kV	8.33	**Scheme No.** BEST/FY-16/01 (8.24) BEST/FY-21/01 (0.09)	6.22%	0.82	0.16
Augmentation / Replacement at existing RSS (Revamping RSS)	20.74	**Scheme No.** BEST/FY-16/02 (2.74) BEST/FY-17/02 (11.38) BEST/FY-18/02 (1.53) BEST/FY-20/02 (3.98) BEST/FY-20/02 (1.11)	15.49%	0.82	0.39
New Dist. Sub. Commissioning & alteration to Existing DSS	35.67	**Scheme No.** BEST/FY-21/03	26.65%	2.67	0.67
Extension of Dist. Network (Laying of HV/LV Lines)	57.01	**Scheme No.** BEST/FY-21/04	42.59%	**10.32**	1.07
Revamping of RSS	15.46	Non-DPR : Aug. of RSS	8.28%	-----	0.29
Energy Meters	15.65	Non-DPR : Energy Meters	0.76%	-----	0.29
Total	**152.86**		**100 %**	**14.63**	**2.88**

9.0 Benefits of CAPEX Schemes:

The Maximum Demand for FY 2022-23 = 898 MVA.

The total capacity of Power Transformer in the system for FY 2022-23 = 2321 MVA

(***Refer Annexure-B, Page No.13)***.

The total capacity of Distribution Transformer in the system for FY 2022-23= 2842 MVA.
By execution of network strengthening schemes we have maintained a ratio of,
Total capacity of Power Transformers in system/Maximum Demand = 2321 MVA/ 898 MVA =2.58
Total capacity of Dist. Transformers in system/Maximum Demand = 2842 MVA /898 MVA = 3.16

These system parameters ensure reliable and quality power supply to the consumers.

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Annexure - A

महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

No. MERC/CAPEX/ FY 2020-21/ **16 July, 2020**

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

<u>Subject:</u> In-principle clearance for the DPR of BEST for "Commissioning of 33/11 KV New Receiving Stations at Pimpalwadi, Spring Mill Chawl (Bombay Dyeing Plot) and Bharat Potdar Mill (India Blue)"(Rs 27.40 Crores)

Sir,

This has reference to your submitted DPR for "Commissioning of 33/11 KV New Receiving Stations at Pimpalwadi,Spring Mill Chawl (Bombay Dyeing Plot) and Bharat Potdar Mill (India Blue)", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1 I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2 No escalation in the unit cost has been considered.

3 The IDC shall be considered after execution of the project at time of tariff Petition.

4 Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BESTwill be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5 BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

१३वा मजला, केंद्र क्र. १, जागतिक व्यापार केंद्र, कफ परेड, कुलाबा, मुंबई - ४०० ००५.
13th Floor, Centre No. 1, World Trade Centre, Cuffe Parade, Colaba, Mumbai - 400 005.
Tel.: 022-2216 3964 / 2216 3965 / 2216 3969 **Fax :** 022-2216 3976
E-mail : mercindia@merc.gov.in / mercindia@mercindia.org.in **Website :** www.merc.gov.in / www.mercindia.org.in

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BESTshould communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

Yours faithfully,

Sd/-

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

<u>**Annexure A**</u>

<u>**Feasibility Report for Capital Investment Scheme for BEST**</u>

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Title (Name of Scheme)</td><td>Commissioning of 33/11 KV New Receiving Stations at Pimpalwadi, Spring Mill Chawl (Bombay Dyeing Plot) and Bharat Potdar Mill (India Blue)</td></tr>
<tr><td>2</td><td>Brief Scope of work</td><td>a. Installation of 33/11 kV, 1x16 MVA transformers.
b. Installation of 33 kV, 11 kV switchgears and accessories.
c. Laying of 33kV cables.
d. Installation of battery & battery charger.
e. Associated civil work for constructing new Receiving Substation.
f. Provision for Air conditioning at control room
g. Provision of Automatic Fire Fighting System.</td></tr>
<tr><td>3</td><td>Objective / Justification</td><td>(i) 24x7 power supply for consumers in Mumbai City.
(ii) To meet increasing load demand in existing areas of supply.
(iii) To improve quality and reliability of supply..</td></tr>
<tr><td>4</td><td>Estimated Cost</td><td>Rs. 27.58 Crore</td></tr>
<tr><td>5</td><td>In-principle approval accorded</td><td>Rs. 27.40 Crore</td></tr>
<tr><td>6</td><td>Cost benefit analysis</td><td>Benefits of Rs 0.74 Crores in the 1st year, going up to Rs.3.56 Crores in the 5th year</td></tr>
<tr><td>7</td><td>Approved Phasing</td><td>
<table>
<tr><th>S. N.</th><th>Particulars</th><th>FY 2020-21</th><th>FY 2021-22</th><th>FY 2022-23</th><th>FY 2023-24</th><th>FY 2024-25</th></tr>
<tr><td>1</td><td>Capital Expenditure in Rs Cr</td><td>5.97</td><td>7.46</td><td>5.71</td><td>5.26</td><td>3.00</td></tr>
<tr><td>2</td><td>Capitalisation in Rs Cr</td><td>5.97</td><td>7.46</td><td>5.71</td><td>5.26</td><td>3.00</td></tr>
<tr><td>3</td><td>IDC</td><td colspan="5">NIL (shall be considered after execution of the project at time of tariff Petition)</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	a. To meet increasing load in existing areas of supply. b. Build & maintain adequate redundancy in the system c. 24x7 power supply for consumers in Mumbai City. d. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking e. To maintain reliability and quality of Electric Supply to the Consumers.
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 0.74 Crores in the 1st year, going up to Rs.3.56 Crores in the 5th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

Appendix –A

Cost Abstract

Pimpalwadi RSS:-

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
1	Power Transformer 16 MVA, 33/11kV with NIFP System	1	146.31	146.31
2	Primary Switchgear 33kV, 1500 MVA SF6 VCB	1	10.41	10.41
3	Secondary Switchgear 11kV 350 MVA (1 set of 9 breakers)	1	37.82	37.82
4	Control, alarm & relay panel with FRLS control cable	1	17.55	17.55
5	Battery Charger	1	4.74	4.74
6	Battery	1	4.06	4.06
7	HT Capacitor	1	13.30	13.30
8	HT Reactor	1	12.96	12.96
9	Earthing works	1	20	20.00
10	Air-conditioning for control room	1	2	2.00
11	Automatic Fire Fighting System	1	25.62	25.62
12	33KVcable laying including R.I. charges	0	182.26	0.00
13	Civil Work	0	0	0.00
	Total cost in Lakh			**294.77**
	Contingency 5%			**14.74**
	Grand Total in Crore			**3.10**

Spring Mill Chawl (Bombay Dyeing):-

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
1	Power Transformer 16 MVA, 33/11kV	1	146.31	146.31
2	Primary Switchgear 33kV, 1500 MVA SF6 VCB	1	10.41	10.41
3	Secondary Switchgear 11kV 350 MVA (1 set of 9 breakers)	1	37.82	37.82
4	Control, alarm & relay panel with FRLS control cable	1	17.55	17.55
5	Battery Charger	1	4.74	4.74
6	Battery	1	4.06	4.06
7	HT Capacitor	1	13.30	13.30
8	HT Reactor	1	12.96	12.96

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
9	Earthing works	1	20	20
10	Air-conditioning for control room	1	2	2
11	Automatic Fire Fighting System	1	25.62	25.62
12	33KVcable laying including R.I. charges	5.18	182.26	930.12
13	Civil Work	1	289.93	289.93
	Total cost in Lakh			**1514.82**
	Contogency 5%			61.24
	Grand Total in Crore			**15.76**

Bharat Potdar Mill RSS:-

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
1	Power Transformer 16 MVA, 33/11kV	1	146.31	146.31
2	Primary Switchgear 33kV, 1500 MVA SF6 VCB	1	10.41	10.41
3	Secondary Switchgear 11kV 350 MVA (1 set of 9 breakers)	1	37.82	37.82
4	Control, alarm & relay panel with FRLS control cable	1	17.55	17.55
5	Battery Charger	1	4.74	4.74
6	Battery	1	4.06	4.06
7	HT Capacitor	1	13.30	13.30
8	HT Reactor	1	12.96	12.96
9	Earthing works	1	20	20
10	Air-conditioning for control room	1	2	2
11	Automatic Fire Fighting System	1	25.62	25.62
12	33KVcable laying including R.I. charges	1.35	179.56	242.41
13	Civil Work	1	289.93	289.93
	Total cost in Lakh			**827.11**
	Contogency 5%			26.86
	Grand Total in crore			**8.54**

महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

सत्यमेव जयते

MERC/CAPEX/2020-21/ 553 **Date: 15 December, 2021**

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject: In-principle clearance for the DPR of BEST for "Revamping of existing Receiving Substations FY 2019-20 to FY 2024-25"(Rs 40.60 Cr)

Sir,

This has reference to your submitted DPR for "Laying of HV and LV Cable and associated equipments", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2. No escalation in the unit cost has been considered.

3. The IDC shall be considered after execution of the project at time of tariff Petition.

4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BESTwill be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

11. It directed to keep in detail all records of its distribution assets in detail and shall ensure that the future DPRs shall be associated with detail asset information.

Yours faithfully,

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

(Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Feasibility Report for Capital Investment Scheme for BEST

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Title (Name of Scheme)</td><td>Revamping of existing Receiving Substations FY 2019-20 to FY 2024-25</td></tr>
<tr><td>2</td><td>Brief Scope of work</td><td>Alteration and augmentation of existing Receiving Substations

Installation of additional transformers- Nepean Sea RSS and Kingsway RSS
Replacement of - Grant Road RSS
Installation of Additional RMU - Avighna RSS
Replacement of 2nos. of AIS bus sections - Elphiston Mill RSS
Replacement of 33 kV switchgears - Mazgaon Dock, Sion Fort, Dharavi, Mahim, Nepean Sea, Colaba and Kingsway RSS
Replacement of 11 kV bus sections - Grant Road, Sewree, Parel, Kingsway, Prabhadevi, Mahalaxmi, Dharavi, Worli, Wadala, Mahim, KEM and Nair Hospital RSS
Replacement / Installation of Capacitors - Cumballa Hill, Kingsway, Wadala, Worli Dairy, Sitaladevi and Sewree RSS.
Replacement / Installation of Reactors - Cumballa Hill, Kingsway, Masjid, Hutatma Chowk, Grant Road, Kussara, Mahalaxmi and Sewree RSS.
Replacement / Installation of Battery Set and charger - Grant Road, Nariman Point, Ballard Estate, Colaba, Hutatma Chowk, Mazgaon Dock and Nestle RSS. Mahalaxmi (only Battery Set)
Replacement Fire Fighting System (WM Type) - Love Grove, Naval Dock RSS.
Replacement Fire Fighting System (CO_2 Type) - Sitaladevi, Sion Fort, Hutatma Chowk, Mahim Causeway, Byculla, Sewree, Khetwadi RSS.
</td></tr>
<tr><td>3</td><td>Objective / Justification</td><td>i) 24x7 power supply for consumers in Mumbai City.
(ii) reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking
(iii) To maintain reliability and quality of Electric Supply to the Consumers.</td></tr>
<tr><td>4</td><td>Estimated Cost</td><td>Rs. 40.60 Crore</td></tr>
<tr><td>5</td><td>In-principle approval accorded</td><td>Rs. 40.60 Crore</td></tr>
<tr><td>6</td><td>Cost benefit analysis</td><td>Benefits of Rs 0.74 Crores in the 2nd year, going up to Rs.5.02 Crores in the 6th year</td></tr>
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<tr><td>1</td><td>Capital Expenditure in Rs. Cr</td><td>15.78</td><td>8.75</td><td>8.52</td><td>2.32</td><td>1.61</td><td>3.62</td></tr>
<tr><td>2</td><td>Capitalisation in Rs Cr</td><td>15.78</td><td>8.75</td><td>8.52</td><td>2.32</td><td>1.61</td><td>3.62</td></tr>
<tr><td>3</td><td>IDC</td><td colspan="6">NIL (shall be considered after execution of the project at time of tariff Petition)</td></tr>
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<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	To meet increasing load in existing areas of supply. Build & maintain adequate redundancy in the system 24x7 power supply for consumers in Mumbai City. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking To maintain reliability and quality of Electric Supply to the Consumers..
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 0.74 Crores in the 2nd year, going up to Rs.5.02 Crores in the 6th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

Appendix –A

DESCRIPTION	TOTAL COST	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
:allation of additional Power Transformers, 16 MVA, 33/11kV and associated ipments at Nepean sea RSS and Kingsway RSS (Qty-2).	13.03	6.56	3.46	3.01			
›lacement / Installation of 33/11kV, 16 MVA Power Transformer at Grant Rd. RSS r-1)	1.89	1.89					
:tallation of additional 1 no. of 33kV, 1500 MVA RMU at Avighna, 33/0.415 kV S (Qty-1).	0.98	0.98					
›lacement / Installation of 33kV, 1500 MVA, AIS Bus Section at Elphiston Mill S (Qty-2).	0.98		0.98				
›lacement of 33kV, 1500 MVA primary switchgears at Mazgaon Dock (1 no.), n Fort (2 nos.), Colaba (1 no.), Nepean Sea (2 nos), Kingsway 2 nos.), Mahim (os), Dharavi (3 nos.) (QTY-13)	2.46		0.88	0.00	0.78	0.22	0.58
›lacement of 11 KV Bus Section, 350 MVA at Grant Rd (4), Sewree RSS, Parel S, (3 nos.each), Dharavi (2), Wadala (2), Kingsway (3), Mahim (2), Prabhadevi KEM(1), Worli(2), Mahalaxmi(3), Nair Hosp.(1) (Qty- 29 nos.).	12.70	2.83	1.56	4.35	0.61	0.78	2.58
placement / Installation of Capacitors at Cumballa Hill RSS, Kingsway RSS, dala RSS, Worli Dairy, Sitaladevi (1 no. each) and Sewree RSS (2 nos) (Qty- 7 .).	0.76			0.29	0.18	0.29	
›lacement / Installation of Reactors at Masjid RSS, Hutatma Chowk RSS, Grant ıd, Cumballa Hill RSS, Kingsway RSS, Kussara RSS, Mahalaxmi RSS (1 no. each) Sewree RSS (2 nos.each). (Qty-9).	2.29			0.75	0.75	0.32	0.47
›lacement / Installation of Battery and charger at Grant Road, Nariman Point RSS, lard Estate RSS, Colaba RSS, Hutatma Chowk RSS, Mazgaon Dock RSS, aravi, Apollo (Qty-8)	0.68	0.48	0.08	0.12			
›lacement Fire Fighting System at Love Grove RSS, Naval Dock RSS (Water Mist oe, Qty-2).	3.04	3.04					
placement Fire Fighting System at Sitaladevi RSS, Sion Fort RSS, Hutatma owk RSS, Mahim Causeway RSS, Byculla RSS, Sewree RSS, Khetwadi RSS (CO2 oe Qty-7).	1.79		1.79				
TOTAL	**40.60**	**15.78**	**8.75**	**8.52**	**2.32**	**1.61**	**3.62**

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

MERC/CAPEX/2022-23/0556

Date: 14 November, 2022

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject: **In-principle clearance for the DPR of BEST for "Revamping of existing Receiving Substations during FY 2020-21 to FY 2022-23" for In-principle approval of the Commission and Post facto approval of capitalization during FY 2019-20"(Rs. 56.07 Cr).**

Sir,

This has reference to your submitted DPR for "Revamping of existing Receiving Substations during FY 2019-20 to FY 2024-25" for In-principle approval of the Commission and Post facto approval of capitalization during FY 2019-20. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2. No escalation in the unit cost has been considered.

3. The IDC shall be considered after execution of the project at time of MYT/MTR tariff Petition.

4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BESTshould communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

11. It directed to keep in detail all records of its distribution assets and shall ensure that the future DPRs shall be associated with detail asset information.

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure "A"

Feasibility Report for Capital Investment Scheme for BEST

Sl. No.	Particulars	Details
1	Title (Name of Scheme)	**Revamping of existing Receiving Substations during FY 2019-20 to FY 2022-23**
2	Brief Scope of work	• Replacement of 10/12.5 MVA Power Transformers at Sitaladevi RSS Tr. No. 4, Byculla RSS Tr. No. 1 & 3 (Qty-3 Nos.) • Replacement of 33 kV switchgears at Mahim Causeway RSS(Qty-3 Nos.) • Diversion of 33 kV feeder cables of RSS viz.Wadala RSS (T/F. No. 1 & 3), Kingsway RSS (T/F. No. 2), Raoli Hill RSS (T/F. No.2), Sion Fort RSS (T/F. No. 2), Pratiksha Nagar (T/F. No. 1), Lodha Crown T6 (T/F. No. 1) from TPC Dharavi RS to TPC Antop Hill RS and laying of additional cables for proposed Pratiksha Nagar RSS (T/F2), Lodha Crown T6 (T/F2), Lodha Crown T10 (T/F1&2) and New RSS commissioning at Dosti Acres (Qty. 16.961 Kms. • Replacement of 33 kV cable from TPC Parel RS to Marathon Futurex along with additional cables. (5.722 Kms.) • Replacement & diversion of 33 kV cable pert portion of Cumballa Hill RSS (T/F 1, 2 & 4) and laying additional one no. of 33 kV cable for Apollo Mill RSS (T/F 2) (Qty. 7.761 Kms.) • Diversion & replacement of EHV Cables of Sitaladevi RSS (T/F 1, 2, 3 & 4), VSNL RSS and VSNL HV consumer from T. H. Kataria Marg ROB below Western Railway Tracks (Qty. 2.210 Kms, Included HDD Cost)) • Diversion& replacement of EHV Cables of part portion of 33 kV feeders DBA1→ Futurex 33 kV HT Room LHS & DBA2→ Futurex 33kV HT Room RHS below Western Railway Tracks (Delisle ROB) (Qty. 3.420 Kms, Included HDD Cost))
3	Objective / Justification	i. To meet increasing load in existing areas of supply. ii. Build & maintain adequate redundancy in the system iii. 24x7 power supply for consumers in Mumbai City. iv. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking v. To maintain reliability and quality of Electric Supply to the Consumers.
4	Estimated Cost	Rs. 56.22 Crore
5	In-principle approval accorded	Rs. 56.07 Crore

-) 4

7	Approved Phasing	<table><tr><th>Sr. No.</th><th>Particulars</th><th>Total</th><th>FY 2019-20</th><th>FY 2020-21</th><th>FY 2021-22</th><th>FY 2022-23</th></tr><tr><td>1</td><td>Capital Expenditure in Rs Cr</td><td>56.07</td><td>8.84</td><td>11.84</td><td>15.77</td><td>19.62</td></tr><tr><td>2</td><td>Capitalisation in Rs Cr</td><td>56.07</td><td>8.84</td><td>11.84</td><td>6.02</td><td>29.37</td></tr></table>
8	Proposed Funding Arrangement	Debt Equity Ratio is 70:30.

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	**To meet increasing load in existing areas of supply.** **Build & maintain adequate redundancy in the system** **24x7 power supply for consumers in Mumbai City.** **Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking** **To maintain reliability and quality of Electric Supply to the Consumers..**
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 0.28 Crores in the 1st year, going up to Rs.1.64 Crores in the 4th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

Appendix – "A"

Cost Abstract

Sr. No.	Name of Scheme	Approved Cost in Rs Cr
1.	Replacement of 10/12.5 MVA Power Transformers at Sitaladevi RSS Tr. No. 4, Byculla RSS Tr. No. 1 & 3 (Qty-3 Nos.)	**5.09**
2.	Replacement of 33 kV switchgears at Mahim Causeway RSS(Qty-3 Nos.)	**0.59**
3.	Diversion of 33 kV feeder cables of RSS viz.Wadala RSS (T/F. No. 1 & 3), Kingsway RSS (T/F. No. 2), Raoli Hill RSS (T/F. No.2), Sion Fort RSS (T/F. No. 2), Pratiksha Nagar (T/F. No. 1), Lodha Crown T6 (T/F. No. 1) from TPC Dharavi RS to TPC Antop Hill RS and laying of additional cables for proposed Pratiksha Nagar RSS (T/F2), Lodha Crown T6 (T/F2), Lodha Crown T10 (T/F1&2) and New RSS commissioning at Dosti Acres (Qty. 16.961 Kms.	**22.55**
4.	Replacement of 33 kV cable from TPC Parel RS to Marathon Futurex along with additional cables. (5.722 Kms.)	**8.51**
5.	Replacement & diversion of 33 kV cable pert portion of Cumballa Hill RSS (T/F 1, 2 & 4) and laying additional one no. of 33 kV cable for Apollo Mill RSS (T/F 2) (Qty. 7.761 Kms.)	**10.92**
6	Diversion & replacement of EHV Cables of Sitaladevi RSS (T/F 1, 2, 3 & 4), VSNL RSS and VSNL HV consumer from T. H. Kataria Marg ROB below Western Railway Tracks (Qty. 2.210 Kms, Included HDD Cost)):	**3.47**
7	Diversion& replacement of EHV Cables of part portion of 33 kV feeders DBA1→ Futurex 33 kV HT Room LHS & DBA2→ Futurex 33kV HT Room RHS below Western Railway Tracks (Delisle ROB) (Qty. 3.420 Kms, Included HDD Cost))	**4.94**
	Grant total	**56.07**

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महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

सत्यमेव जयते

MERC/CAPEX/2021-22/ 552 **Date: 15 December, 2021**

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject:In-principle clearance for the DPR of BEST for "Commissioning of New Distribution Substations (DSS) and Revamping of existing Distribution Substationsfor FY 2020-21 to FY 2024-25"(Rs. 150 Cr).

Sir,

This has reference to your submitted DPR for "Commissioning of New Distribution Substations (DSS) and Revamping of existing Distribution Substationsfor FY 2020-21 to FY 2024-25", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2. No escalation in the unit cost has been considered.

3. The IDC shall be considered after execution of the project at time of MYT/MTR tariff Petition.

4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BESTshould communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

11. It directed to keep in detail all records of its distribution assets in detail and shall ensure that the future DPRs shall be associated with detail asset information.

Yours faithfully,

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

18

Annexure "A"

Feasibility Report for Capital Investment Scheme for BEST

Sl. No.	Particulars	Details
1	Title (Name of Scheme)	**Commissioning of New Distribution Substations (DSS) and Revamping of existing Distribution Substations for FY 2020-21 to FY 2024-25**
2	Brief Scope of work	• Commissioning of New DSS (40 nos./year) • Installation of Additional Distribution transformers (DTs) and replacement of transformers with higher capacity and age old DTs at existing DSS (30Nos/year) • Replacement of OCBs by VCBs at existing DSS (25 nos./year). • Remodeling of dilapidated DSS (Relocation-10 nos./year)
3	Objective / Justification	i. To meet increasing load in existing areas of supply. ii. Build & maintain adequate redundancy in the system iii. 24x7 power supply for consumers in Mumbai City. iv. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking v. To maintain reliability and quality of Electric Supply to the Consumers.
4	Estimated Cost	Rs. 152.3 Crore
5	In-principle approval accorded	Rs. 150 Crore
6	**1.1.1** Cost benefit analysis	Benefits of Rs 2.60 Crores in the 1st year, going up to Rs.23.09 Crores in the 5th year
7	Approved Phasing	(see table below)
8	Proposed Funding Arrangement	Debt Equity Ratio is 70:30.

Approved Phasing:

S. N.	Particulars	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
1	Capital Expenditure	30.2	29.95	29.95	29.95	29.95
2	Capitalisation	30.2	29.95	29.95	29.95	29.95
3	IDC	NIL (shall be considered after execution of the project at time of MYT/MTR tariff Petition)				

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	**To meet increasing load in existing areas of supply.** **Build & maintain adequate redundancy in the system** **24x7 power supply for consumers in Mumbai City.** **Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking** **To maintain reliability and quality of Electric Supply to the Consumers..**
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 2.26 Crores in the 1st year, going up to Rs.23.09 Crores in the 5th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified. BEST's expenditure phasing in the DPR proposal was starting from FY 20-21 to FY 24-25. As the year FY 2020-21 has been lapsed, the expenditure is shifted one year ahead i.e. starting from FY 21-22 to FY 25-26.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

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Appendix – "A"

Cost Abstract

Sr. No.	Item Description	FY2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
A	Commissioning of DSS (40 nos/year)	17.49	17.49	17.49	17.49	17.49
B	Augmentation/Replacement of Transformers (30 nos./year)*	5.24	4.99	4.99	4.99	4.99
C	Remodeling of DSS (10 nos./year)	4.78	4.78	4.78	4.78	4.78
D	Replacement of OCBs by VCBs (25 nos. of DSS/year)	2.69	2.69	2.69	2.69	2.69
	Total = Rs. 150 Crs	**30.20**	**29.95**	**29.95**	**29.95**	**29.95**

**For FY 20-21, Augmentation/Replacement of Transformers Qty is 32 Nos*

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
॥आदित्य हृदयम्॥

MERC/CAPEX/2020-21/ **Date: 22 June, 2020**

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject: In-principle clearance for the DPR of BEST for "Laying of HV and LV Cable and associated equipments for FY 2020-21 to FY 2024-25"(Rs 246.20 Cr)

Sir,

This has reference to your submitted DPR for "Laying of HV and LV Cable and associated equipments", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2. No escalation in the unit cost has been considered.

3. The IDC shall be considered after execution of the project at time of tariff Petition.

4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BESTwill be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

Yours faithfully,

Sd/-
(Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

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<u>**Feasibility Report for Capital Investment Scheme for BEST**</u>

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Title (Name of Scheme)</td><td>Laying of HV and LV Cable and associated equipments for FY 2020-21 to FY 2024-25</td></tr>
<tr><td>2</td><td>Brief Scope of work</td><td>• Laying of HV cable (25 KM per year)
• Laying of LV cables (56 KM per year)
• Installation of Auxillary Distribution Feeders (135 Nos per Year)
• Laying of service cables and installation of associated equipments.(40 KM per year)</td></tr>
<tr><td>3</td><td>Objective / Justification</td><td>• To increase the reach to consumers.
• To enhance the last mile connectivity
• To improve network flexibility.</td></tr>
<tr><td>4</td><td>Estimated Cost</td><td>Rs. 246.20 Crore</td></tr>
<tr><td>5</td><td>In-principle approval accorded</td><td>Rs. 246.20 Crore</td></tr>
<tr><td>6</td><td>Cost benefit analysis</td><td>Benefits of Rs 2.26Crores in the 1st year, going up to Rs.23.09Crores in the 5th year</td></tr>
<tr><td>7</td><td>Approved Phasing</td><td>
<table>
<tr><th>S. N.</th><th>Particulars</th><th>FY 2020-21</th><th>FY 2021-22</th><th>FY 2022-23</th><th>FY 2023-24</th><th>FY 2024-25</th></tr>
<tr><td>1</td><td>Capital Expenditure in Rs Cr</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td></tr>
<tr><td>2</td><td>Capitalisation in Rs Cr</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td></tr>
<tr><td>3</td><td>IDC</td><td colspan="5">NIL (shall be considered after execution of the project at time of tariff Petition)</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	• To meet increasing load in existing areas of supply. • Build & maintain adequate redundancy in the system • 24x7 power supply for consumers in Mumbai City. • Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking • To maintain reliability and quality of Electric Supply to the Consumers..
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 2.26 Crores in the 1st year, going up to Rs.23.09 Crores in the 5th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

Appendix –A
Cost Abstract

Sr. No.	Item Description	CABLE TYPE	Rs. Crore PER KM	Per Year QTY in KM	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
A	**HV CABLE**		UNIT COST		**CAPITAL EXPENTITURE (In CRORE)**				
1	Laying of 11 KV HV Cables	AL, XLPE	0.2566	**25.000**	**6.41**	**6.41**	**6.41**	**6.41**	**6.41**
B	**LVCABLE**								
1	Laying of 1.1 KV 4CX300 SQ.MM CABLE	AL, XLPE	0.2061	36.000	7.42	7.42	7.42	7.42	7.42
2	Laying of 1.1 KV 4CX120 SQ.MM CABLE	AL, XLPE	0.1349	5.500	0.74	0.74	0.74	0.74	0.74
3	Laying of 1.1 KV 4CX70 SQ.MM CABLE	AL, XLPE	0.1232	1.000	0.12	0.12	0.12	0.12	0.12
4	Laying of 1.1 KV 4CX25 SQ.MM CABLE	AL, XLPE	0.1042	2.500	0.26	0.26	0.26	0.26	0.26
5	Laying of 1.1 KV 2CX25 SQ.MM CABLE	AL, XLPE	0.1003	0.500	0.05	0.05	0.05	0.05	0.05
6	Laying of 1.1 KV 2CX50 SQ.MM CABLE	AL, XLPE	0.1051	1.000	0.11	0.11	0.11	0.11	0.11
7	Laying of 1.1 KV 3CX95 SQ.MM CABLE	AL, XLPE	0.1195	0.500	0.06	0.06	0.06	0.06	0.06
8	Laying of 1.1 KV 1CX400 SQ.MM CABLE	CU. XLPE	0.2920	9.000	2.63	2.63	2.63	2.63	2.63
	TOTAL OF B			**56.000**	**11.39**	**11.39**	**11.39**	**11.39**	**11.39**
C	**R I Cost (HV+LV)**		0.7708	**24.27**	**18.71**	**18.71**	**18.71**	**18.71**	**18.71**
D	**Auxiliary Distribution Pillars (ADP)**								
1	6 WAY ADP	-	0.0087	95	0.83	0.83	0.83	0.83	0.83
2	10 WAY ADP	-	0.0110	30	0.33	0.33	0.33	0.33	0.33
3	12 WAY ADP	-	0.0125	10	0.12	0.12	0.12	0.12	0.12
	TOTAL OF D			**135**	**1.28**	**1.28**	**1.28**	**1.28**	**1.28**
E	**SERVICE CABLE (QTY IN KM)**								
1	Laying of 1.1 KV 4CX300 SQ.MM CABLE	AL, XLPE	0.2061	26.000	5.36	5.36	5.36	5.36	5.36
2	Laying of 1.1 KV 4CX120 SQ.MM CABLE	AL, XLPE	0.1349	4.000	0.54	0.54	0.54	0.54	0.54
3	Laying of 1.1 KV 4CX70 SQ.MM CABLE	AL, XLPE	0.1232	2.000	0.25	0.25	0.25	0.25	0.25
4	Laying of 1.1 KV 4CX25 SQ.MM CABLE	AL, XLPE	0.1042	2.800	0.29	0.29	0.29	0.29	0.29
5	Laying of 1.1 KV 2CX25 SQ.MM CABLE	AL, XLPE	0.1003	5.200	0.52	0.52	0.52	0.52	0.52
	TOTAL OF E			**40.000**	**6.96**	**6.96**	**6.96**	**6.96**	**6.96**
F	**R I Cost (SERVICE CABLE) (kms)**	-	0.7708	**5.830**	**4.49**	**4.49**	**4.49**	**4.49**	**4.49**
	GRAND TOTAL (A+B+C+D+E+F) in Cr	**246.2**			**49.24**	**49.24**	**49.24**	**49.24**	**49.24**

4th QTR Capex & Capitalisation for F.Y. 2022-23

Sr. No.	Project Code	MERC Approval No.	MERC Approval Date	MERC Approved Cost	Cumulative Expenditure Incurred till beginning of the Year	Capital Expenditure Capitalised	Opening CWIP FY 22-23	Investment during the year up to March 2023	Capital Work in Progress: Works Capitalised upto March 2023	Capital Work in Progress: Interest Capitalised	Capital Work in Progress: Expenses Capitalised	Capital Work in Progress: Total Capitalisation	Closing CWIP
	FY 2022-23												
	a) DPR Schemes												
	(i) In-principle approved by MERC												
	New RSS												
1	BEST/ FY16/01	MERC/CAPEX/FY2016-17 00770 dtd. 28.09.2016	28.09.2016	82.23	16.79	8.56	8.23	6.19	8.24			8.24	6.18
2	BEST/ FY21/01	MERC/CAPEX/FY2020-21/	16.07.2020	27.40	0.00	0.00	0.00	0.09	0.09			0.09	0.00
	Augmentation/Replacement at Existing RSS												
3	BEST/ FY16/02	MERC/DESK TECH_V/CAP/DPR/20122013/02688	22.02.2013	36.63	11.46	11.46	0.00	2.74	2.74			2.74	0.00
4	BEST/ FY17/02	MERC/CAPEX/ 2017-18/4706	16.11.2017	64.09	21.58	21.58	0.00	11.38	11.38			11.38	0.00
5	BEST/ FY18/02	MERC/CAPEX/ 2017-18/4706	16.11.2017	58.86	3.89	3.89	0.00	1.53	1.53			1.53	0.00
6	BEST/ FY 18/02A	MERC/CAPEX/ 2019-20/135	10.05.2019	15.58	18.02	18.02	0.00	0.00	0.00			0.00	0.00
7	BEST/ FY20/02	MERC/CAPEX/2020-21/553	15.12.2021	40.60	7.09	7.09	0.00	3.98	3.98			3.98	0.00
8	IPDS/BEST/ FY15-16/01	MERC/CAPEX/2019-20/418 (L & T PART)	26.07.2019	92.40	66.63	66.63	0.00	0.00	0.00			0.00	0.00
	IPDS/BEST/ FY15-16/01	BEST PART	26.07.2019	25.69	25.06	25.06	0.00	0.00	0.00			0.00	0.00
9	BEST/ FY21/02	MERC/CAPEX/2022-23/0556	14.11.2022	56.07	5.56	5.56	0.00	1.11	1.11			1.11	0.00
	New DSS & Aug. & Alt. to exist. DSS												
	Extension of Distribution Network												
10	BEST/ FY21/03	MERC/CAPWX/ 2020-21/552	15.12.2021	147.65	0.00	0.00	0.00	35.67	35.67			35.67	0.00
11	BEST/ FY21/04	MERC/CAPEX/2020-21	22.06.20	246.20	0.00	0.00	0.00	57.01	57.01			57.01	0.00
	SCADA,BPA & Distribution Automation												
12	BEST/ FY18/08A	MERC/CAPEX/2017-18/4759	22.11.17	13.12	0.00	0.00	0.00	0.00	0.00			0.00	0.00
13	BEST/ FY18/08B	MERC/CAPEX/2017-18/4886	13.12.2017	9.22	0.45	0.45	0.00	0.00	0.00			0.00	0.00
	Energy Meter												
14	BEST/FY19/06	MERC/CAPEX/2019-20/1110	28.11.2019	30.19	17.31	17.31	0.00	0.00	0.00			0.00	0.00
15	IPDS/BEST/ FY2015-16/01	MERC/CAPEX/2019-20/116	18.04.2019	12.94	12.90	12.90	0.00	0.00	0.00			0.00	0.00
	(ii) Yet to receive in-principle MERC approval												
	b) Non-DPR Schemes												
16	Energy Meter	-			14.63	0.00	14.63	1.02	15.65			15.65	0.00
17	Revamping of RSS & other schemes (Non-DPR)	-	-		11.80	7.43	4.37	13.05	15.46			15.46	1.96
18	BPA		-		0.96	0.96	0.00	0.03	0.03			0.03	0.00
19	Street Lighting (lamps & Cables)	-	-		10.46	10.46	0.00	6.69	6.69			6.69	0.00
20	Furniture, Office Eq., Tools, Civil Engg. Works, Motor Vehicle etc.	-	-		5.45	5.45	0.00	2.01	2.01			2.01	0.00
21	GFA				0.26	0.26	0.00	18.90	18.90			18.90	0.00
	Total			**958.87**	**250.30**	**223.07**	**27.23**	**161.40**	**180.49**	**0.00**	**0.00**	**180.49**	**8.14**
							188.63		**215.86**				

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Annexure-B

F.Y.	2020-21	2021-22	2022-23	2023-24	2024-25
sale in Mus	4643.66	4683.78	4537.98	4772.81	5023.20
RoE projected	129.45	130.37	139.11	143.82	148.72
RoE/ unit	0.279	0.278	0.307	0.301	0.296

Particulars	Unit	Value	Value	Value	Value	Value
Total capacity added by additional Tr.	MVA	**16.00**	0.00	0.00	0.00	**32.00**
Average Power Factor		0.9900	0.9900	0.9900	0.9900	0.9900
Current RSS Load factor		62.05%	62.56%	60.04%	59.64%	58.01%
RoE/ unit	Rs.	0.279	0.278	0.307	0.301	0.296

Calculation of loading rates

loading trend	1st year	2nd year	3rd year	4th year	5th year
loading percentages	20.00%	30.00%	40.00%	50.00%	58.01%

Revenue due to additional sales

Particulars	F.Y. 2020-21	F.Y. 2021-22	F.Y. 2022-23	F.Y. 2023-24	F.Y. 2024-25
Cumulative capacity commissioned (MVA)	**16.00**	**16.00**	**16.00**	**16.00**	**48.00**
Incremental loading	20.00%	30.00%	40.00%	50.00%	58.01%
Distribution losses	3.82%	4.63%	4.18%	4.12%	4.18%
System power factor	0.9900	0.9900	0.9900	0.9900	0.9900
Additional sales (MU)	26.69	39.70	53.18	66.52	130.31
RoE per Unit (Rs/ unit)	0.279	0.278	0.307	0.301	0.296
Total adduitional revenue (Rs. Crore)	0.74	1.11	1.63	2.00	3.86

Capitalisation schedule

Particulars	TOTAL	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Capital Expenditure for the scheme (Rs. Cro	27.40	5.97	7.46	5.71	5.26	3.00
Amount proposed to be capitalized	27.40	5.97	7.46	5.71	5.26	3.00

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
World Trade Centre, Centre No.1, 13th Floor, Cuffe Parade, Mumbai – 400 005
Tel. No. 022- 22163964/ 65/ 69 Fax No. 022 - 22163976
Email: mercindia@merc.gov.in
Website: www.merc.gov.in

CASE No. 212 of 2022

In the matter of

Petition of Brihanmumbai Electric Supply and Transport Undertaking (BEST) for Truing-up of Aggregate Revenue Requirement (ARR) for FY 2019-20, FY 2020-21 and FY 2021-22, Provisional Truing-up of ARR FY 2022-23 and revised ARR & Tariff for FY 2023-24 and FY 2024-25

Coram
Sanjay Kumar, Chairperson
I. M. Bohari, Member
Mukesh Khullar, Member

Date: 31 March, 2023

ORDER

In accordance with Regulation 5 of the Maharashtra Electricity Regulatory Commission (Multi-Year Tariff) Regulations, 2019 ('**MYT Regulations, 2019**'), Brihanmumbai Electric Supply and Transport Undertaking (BEST) has filed its Mid Term Review Petition for Truing-up of Aggregate Revenue Requirement (ARR) for FY 2019-20, 2020-21 and FY 2021-22, Provisional Truing-up of ARR for FY 2022-23 and revised ARR & Tariff for FY 2023-24 and FY 2024-25. The original Petition was filed on 30 November, 2019 and the revised Petition after incorporating the replies to the data gaps was filed on 17 January, 2023.

The Petition has been filed in accordance with MERC (Multi Year Tariff) Regulations, 2015 ("**MYT Regulations, 2015**"), for Truing-up of ARR for FY 2019-20 and in accordance with MYT Regulations, 2019, for Truing-up of ARR of FY 2020-21 and FY 2021-22, Provisional Truing-up of ARR for FY 2022-23 and revised ARR and Tariff for FY 2023-24 and FY 2024-25.

The Commission, in exercise of the powers vested in it under Sections 61 and 62 of the Electricity Act (**EA**), 2003 and all other powers enabling it in this behalf, and after taking into consideration the submissions made by BEST and suggestions/objections received during the public consultation process, and all other relevant material, has approved the Truing-up of ARR for FY 2019-20, FY 2020-21 and FY 2021-22, Provisional Truing-up of ARR for FY 2022-23 and revised ARR and Tariff for FY 2023-24 and FY 2024-25 in this Order.

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accepts the methodology suggested by BEST.

Table 172: Energy Sales for FY 2022-23, as approved by the Commission (MU)

Particulars	MYT Order	MTR Petition	Approved in this Order
Energy Sales	4,726.93	4,550.60	4,550.60

5.2.9 Further, sales being an uncontrollable factor as per Regulations 9 of the MYT Regulations, 2019, the energy sales as submitted by BEST are provisionally approved by the Commission for FY 2022 -23 as shown in Table above.

5.3 Distribution Losses and Energy Balance

BEST's Submission

5.3.1 BEST has achieved a distribution loss of 4.63% in FY 2021-22. BEST has projected reduction in distribution loss further by 0.1% and considered distribution loss at 4.53% for FY 2022-23.

5.3.2 BEST submitted that the Intra-State Transmission (InSTS) loss of 3.18% has been considered while estimating the energy balance for FY 2022-23 as approved by the Commission in the MYT Order.

5.3.3 Based on proposed distribution loss of 4.53% and provisional transmission loss of 3.18% (as estimated by InSTS in its MTR Tariff Petition), BEST has estimated energy requirement for FY 2022-23 at G-T interface as shown in the below table.

Table 173 : Energy Balance for FY 2022-23, as submitted by BEST

Particulars	MYT Order	MTR Petition
Sales (MU)	4,726.99	4,537.98
Distribution loss (%)	4.18%	4.53%
Energy Requirement at T-D interface (MU)	4,933.20	4,753.30
Intra-state Transmission loss (%)	3.18%	3.18%
Energy Requirement at G-T interface (MU)	5,095.15	4,909.42

5.3.4 BEST has been taking various initiatives such as continuous vigilance activities, raids, consumer awareness on theft and energy conservation, legal actions against theft incidences and faulty meter replacements. BEST submitted that for the past few years except some exceptional years, BEST has been able to consistently maintain its distribution losses in the range of 4.5% to 5% which are almost near to the technical minimum of the network. The present distribution losses are one of the lowest in the country.

5.3.5 Further, the purchase units are recorded on the 1st of every month i.e., the purchase

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are for 365 days. Whereas BEST has a total of 24 billing cycles of 30 days billing period for its around 10.36 lacs consumers, these cycles have different meter reading dates spread throughout the month. Sometimes there is a possibility of this period getting reduced or increased by a day or two due to holidays etc. Hence in some years the billing period can vary from 365 days to 366 days. Hence, any such variation in the billing cycle for a day or two can also cause the loss to vary. Therefore, the distribution loss targets for the future periods should have a buffer to accommodate such variations. Hence, BEST has taken a realistic approach and proposed 0.1% reduction in the distribution loss achieved in FY 2021-22.

Commission's Analysis and Ruling

5.3.6 The Commission noted the submission of BEST. For computation of Energy Balance and energy requirement for FY 2022-23, the Commission has considered the estimated sales as approved in this Order.

5.3.7 In MYT Order, the Commission has approved Distribution loss target of 4.18% for FY 2022-23. The Commission notes BEST has sought Distribution loss target of 4.53% for FY 2022-23 even though it has achieved actual Distribution loss of 3.93% for FY 2020-21. BEST has not been able to conclusively justify its claim that it may not be able to maintain the loss levels as approved in the MYT Order. The justification given is very generic in nature. To maintain consistency in its approach, the Commission has decided not to restate the loss trajectory as approved in the MYT Order and thus during provisional Truing-up for FY 2022-23, the Commission maintains Distribution loss target of 4.18% same as approved in MYT Order.

5.3.8 Accordingly, the Commission has considered the T<>D input of 4,735.94 MU for FY 2022-23. The InSTS Loss has been considered as 3.18% based on the loss as approved in the MYT Order.

5.3.9 In view of the above, the Distribution Loss and Energy Balance as provisionally approved by the Commission for FY 2022-23 are given in the Table below:

Particulars	MYT Order	MTR Petition	Approved in this Order
Sales (MU)*	4,726.99	4,537.98	4,537.98
Distribution loss (%)	4.18%	4.53%	4.18%
Energy Requirement at T-D interface (MU)	4,933.20	4,753.30	4,735.94
Intra-state Transmission loss (%)	3.18%	3.18%	3.18%
Energy Requirement at G-T interface (MU)	5,095.15	4,909.42	4,891.49

*-Sales considered on kWh basis

5.3.10 The Commission approves energy requirement at G<>T interface of 4,891.49 MU on provisional Truing up of ARR for FY 2022-23.

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Table 206: Provision for Bad and Doubtful Debts for FY 2022-23, as approved by the Commission (Rs. Crore)

Particulars	MYT Order	MTR Petition	Approved in this Order	Wire Business	Supply Business
Provision for Doubtful debts	6.74	10.53	7.97	0.80	7.18

5.14.4 The Commission approves the Provision for Bad and Doubtful Debts of Rs. 7.18 Crore on provisional Truing up of ARR for FY 2022-23.

5.15 Return on Equity

BEST's Submission

5.15.1 BEST submitted that it has considered the Return on equity computed as per Regulation 29 of the MYT Regulations, 2019. For the purpose of arriving at the Regulatory Equity at the beginning of FY 2022-23, BEST has considered the closing equity at the end of FY 2021-22 as submitted in Truing-Up of FY 2021-22.

5.15.2 BEST submitted the details of Return on Equity for Wires & Supply business as under:

Table 207 : Return on Equity for Wires Business for FY 2022-23, as submitted by BEST (Rs. Crore)

Particulars	MYT Order	Estimated
Regulatory Equity at the beginning of the year	831.70	878.46
Capitalisation during the year	-	115.39
Equity portion of capitalisation during the year	15.73	34.62
Reduction in Equity Capital on account of retirement / replacement of assets	10.67	17.73
Regulatory Equity at the end of the year	836.77	895.35
	-	-
Return on Equity Computation	-	-
Base Rate of Return on Equity	14.00%	14.00%
Pretax Return on Equity after considering effective Tax rate	-	-
Return on Regulatory Equity at the beginning of the year	116.44	122.98
Return on Regulatory Equity addition during the year	0.35	1.18
Total Return on Equity	**116.79**	**124.17**

Table 208 : Return on Equity for Retail Business for FY 2022-23, as submitted by BEST (Rs. Crore)

Particulars	MYT Order	Estimated
Regulatory Equity at the beginning of the year	92.41	97.61
Capitalisation during the year	-	12.82
Equity portion of capitalisation during the year	1.75	3.85
Reduction in Equity Capital on account of retirement / replacement of assets	1.19	1.97
Regulatory Equity at the end of the year	92.97	99.48
	-	-

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Particulars	MYT Order	Estimated
Return on Equity Computation	-	-
Base Rate of Return on Equity	15.50%	15.50%
Pretax Return on Equity after considering effective Tax rate	-	-
Return on Regulatory Equity at the beginning of the year	14.32	15.13
Return on Regulatory Equity addition during the year	0.04	0.15
Total Return on Equity	**14.37**	**15.27**

5.15.3 BEST requested the Commission to approve the Return on Equity of as shown in table above for FY 2022-23.

Commission's Analysis and Ruling

5.15.4 In absence of non-applicability of Income Tax as BEST being Local Authority, the Commission has computed RoE at 14% and 15.5% of the equity for Wires Business and Supply Businesses, respectively, in accordance with the MYT Regulations, 2019.

5.15.5 The Commission has computed RoE in accordance with Regulation 29 of the MYT Regulations, 2019, based on opening equity, addition of equity as per approved capitalisation and weighted average rate of RoE based on allocation of assets to the wires and supply business.

5.15.6 To determine the equity eligible for return as per the Regulations, the Commission has considered the closing equity for FY 2021-22 approved in this Order on Truing-up, as the opening equity for FY 2022-23. The addition in equity has been considered equal to the equity component of asset addition during the year. The impact of the replacement of assets is considered by reducing the equity to the extent of 30 % of the GFA of the assets that have been retired during the year.

5.15.7 The RoE approved upon provisional Truing up for FY 2022-23 is as per the following Table:

Table 209: Return on Equity for FY 2022-23, as approved by the Commission (Rs. Crore)

Particulars	MYT Order	MTR Petition	Approved in this Order	Wire Business	Supply Business
Regulatory Equity at the beginning of the year	924.11	976.07	968.47	871.62	96.85
Equity portion of capitalisation during the year	17.48	38.46	35.21	31.69	3.52
Reduction in Equity Capital on account of retirement / replacement of assets	11.85	19.70	5.91	5.32	0.59
Regulatory Equity at the end of the year	**929.74**	**994.83**	**997.77**	**898.00**	**99.78**
Return on Regulatory Equity at the beginning of the year	130.76	138.11	137.04	122.03	15.01
Return on Regulatory Equity addition during the year	0.40	1.33	2.07	1.85	0.23
Total Return on Equity	**131.16**	**139.44**	**139.11**	**123.87**	**15.24**

5.15.8 The Commission approves Return on Equity of Rs. 139.11 Crore on provisional Truing up of ARR for FY 2022-23.

The Brihanmumbai Electric Supply and Transport Undertaking. Statistical data for the Years 1947 to 2021-22.

Sr. No.	DESCRIPTION	Unit	2019-20	2020-21	2021-22	2022-23	2023-24
I.	**Energy Purchase Details**						
1	Units Purchased at T&D	in MUs	4790.60	3926.96	4266.59	4678.68	4944.06
2	Cost of Energy	Rs. in Crores	2445.19	2317.29	2803.51	3774.99	3166.41
3	F.A. Paid to Tatas	Rs. in Crores	99.75	100.75	100.75	101.75	102.75
3	Average Cost Per Unit Purchased at T&D	in Paise / Unit	510.41	590.10	657.09	806.85	640.45
II.	**Energy Sale Details**						
1	Units Sold	in MUs	4569.34	3776.84	4068.97	4483.32	4740.15
2	Income from Sale of Energy	Rs. in Crores	3466.68	2792.74	2995.19	3527.52	4188.89
3	Average Selling Rate Per Unit Sold	in Paise / Unit	758.68	739.44	736.11	786.81	883.70
III.	**Surplus**						
1	Revenue Surplus	Rs. in Crores	1021.49	475.46	191.68	-247.48	1022.48
2	Revenue Surplus Per unit Purchased	in Paise / Unit	213.23	121.07	44.93	-52.90	206.81
3	Electricity Duty Collected for Govt. of Maharashtra	Rs. in Crores	563.27	444.76	467.82		
IV.	**Average Distribution Loss**	%	4.62	3.82	4.63	4.18	4.12
V.	Stystem Load Factor	%	58.97	62.05	62.56	60.04	59.64
	Co-incident Maximum Demand	in MVA	936.81	729.80	786.38	898.54	955.96
	Receiving Sub-stations						
	No. of Receiving Sub-stations		64	64	64	65	65
	No. of Power Transformers		152	153	153	155	155
	Capacity of Power Transformers	in MVA	2255	2283	2289	2321	2327
	Distribution Sub-stations						
	No. of Distribution Sub-stations		2428	2451	2477	2507	2538
	No. of Distribution Transformers		3264	3298	3334	3430	3470
	Capacity of Distribution Transformers	in MVA	2645	2682	2717	2842	2892

F.Y.	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Sale in Mus	4569.34	3776.84	4068.97	**4537.98**	4740.15	5038.14
RoE projected	140.93	129.45	130.37	**139.11**	143.82	148.72
RoE/ unit	0.308	0.343	0.320	**0.307**	0.303	0.295

Revenue due to additional sales

Particulars	F.Y. 2019-20	F.Y. 2020-21	F.Y. 2021-22	F.Y. 2022-23	F.Y. 2023-24	F.Y. 2024-25
Cumulative capacity commissioned (MVA)	**0.00**	**0.00**	**0.00**	**6.00**	**6.00**	**6.00**
Incremental loading	0.00%	20.00%	30.00%	**40.00%**	50.00%	58.97%
Distribution losses	4.62%	3.82%	4.63%	**4.18%**	4.12%	4.18%
System power factor	0.9900	0.9900	0.9900	**0.9900**	0.9900	0.9900
Additional sales (MU)	0.00	0.00	24.81	**9.97**	59.87	74.28
RoE per Unit (Rs/ unit)	0.308	0.343	0.320	**0.307**	0.303	0.295
Total adduitional revenue (Rs. Crore)	0.00	0.00	0.79	**0.31**	1.82	2.19

Capitalisation schedule

Particulars	F.Y. 2019-20	F.Y. 2020-21	F.Y. 2021-22	F.Y. 2022-23	F.Y. 2023-24	TOTAL
Capital Expenditure for the scheme (Rs. Crores)	8.84	11.84	15.77	19.62	0.00	56.07
Amount proposed to be capitalized	8.84	11.84	6.02	29.37	0.00	56.07

Commission's Analysis and Ruling

5.18.4 The Commission has noted the submission of BEST. BEST has considered actual revenue of April to September 2022 and estimated for October 2022 to March 2023. The Commission considers the submission of BEST and approves revenue of Rs. 3,667.98 Crore provisionally for FY 2022-23 same as submitted by BEST.

Table 214: Provisional Revenue of FY 2022-23 as approved by the Commission.

Consumer category	Sales*	Revenue	Average Billing Rate
	MU	Rs. Crore	Rs/kWh
HT Category			
HT-1 Industrial	190.39	146.55	7.70
HT-2 Commercial	208.45	187.14	8.98
HT-3 Group Hsg	32.12	24.32	7.57
HT-4 Railway Metro	2.57	2.71	10.54
HT 5A Govt Sch & Hosp.	27.78	20.71	7.45
HT 5B Public Ser. Oths	186.01	151.57	8.15
HT 6 EV chg.	-	-	
Sub-Total	**647.33**	**533.01**	8.23
LT Category			
LT-1 A (BPL)	0.04	0.01	3.57
LT-1 B Residential			
0-100	749.71	1,494.99	7.11
101-300	721.10		
301-500	237.62		
501<	395.33		
LT2 (a)Comm <20	826.49	710.33	8.59
LT2 (b) 20-50 Comm.	170.76	185.78	10.88
LT2 (c) >50 Comm.	358.23	396.11	11.06
LT3A Industrial <20 kW	105.74	74.88	7.08
LT 3B >20 Industrial	79.81	74.98	9.40
LT-4A Schools & Hosp	61.40	43.83	7.14
LT-4B Public Service	178.82	130.09	7.28
LT 5A Agriculture Pumpset	-	-	
LT 5B Agriculture Other	0.05	0.03	5.85
LT-11 Vehicle Chg	18.17	11.97	6.58
Sub-Total	**3,903.27**	**3,123.00**	8.00
Diff in billing adjustment		-3.38	
Total	**4,550.60**	**3,652.63**	8.03
Other adjustment related to Penalty, ToD, etc		**15.35**	
Grand Total	**4,550.60**	**3,667.98**	**8.06**

*- HT units is in KVAh and LT is in kWh

2. Revamping of existing Distribution Substations- Installation of Additional Distribution transformers (DTs) and replacement of transformers with higher capacity, replacement of ONAN type DTs with Dry Type DTs and replacement of age old DTS at existing DSS (25 nos.) :-

The augmentation of DSS has been undertaken based on clearances and permits issued by Municipal Corporation of Greater Mumbai (MCGM) and availability of sufficient space in existing DSS for installation of such equipments. The capacities of DSS are planned to be augmented either by installation of additional DTs or remodelling of DSS or by replacing the DTs with higher capacity DTs. Based on the requisitions received, BEST has proposed to add 49.21 MVA to 55.76 MVA capacities during the FY 2020-21 to FY2024-25 respectively.

Table no 12 : Capacity addition by new DSS and augmenting the existing DSS

Sr. No.	Rating kVA	FY 2020-21				FY 2021-22				FY 2022-23				FY 2023-24				FY 2024-25			
		No. of Tr. added				No. of Tr. added				No. of Tr. added				No. of Tr. added				No. of Tr. added			
		New DSS	Add. DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added
1	630	21	2	1	14.72	22	2	1	15.35	22	2	1	15.350	22	2	1	15.35	23	2	1	15.98
2	995	12	2	19	20.865	12	2	20	21.23	13	2	20	22.225	13	2	21	22.59	14	2	22	23.95
3	1600	7	0	4	13.62	7	0	4	13.62	7	0	5	14.225	8	0	5	15.825	8	0	5	15.825
MVA Add		36.37	3.25	9.59		37.00	3.25	9.95		38.00	3.25	10.56		39.60	3.25	10.92		41.22	3.25	11.29	
Total DT No.		40	4	24		41	4	25		42	4	26		43	4	27		45	4	28	
MVA Add		**49.205**				**50.20**				**51.800**				**53.765**				**55.755**			

Annexure-C

NEWLY COMMISSIONED DSS DURING FY 2022-23 (Table-A)					
SR. No.	NAME OF THE DSS	No. of X'ers	Capacity	MVA Added	Month of Installation
1	VIVAREA DSS	1	1600	1.6	Apr-22
2	AJMAL HEIGHT DSS	1	630	0.63	May-22
3	NAMAN REGENCY DSS	3	630	1.89	May-22
4	KRISHNA APARTMENT DSS	1	630	0.63	May-22
5	MAZGAON COURT DSS	3	995	2.985	Jun-22
6	CCIL ANNEX DSS	1	995	0.995	Jun-22
7	SOMAIYA AYURVIHAR DSS	2	630	1.26	Jun-22
8	CANCARE DSS (HV)	0	0	0	Jul-22
9	M/S. SARAH HOUSING DEVELOPMENT PVT LTD	2	1600	3.2	Aug-22
10	GAWADE MARKET DSS	1	995	0.995	Aug-22
11	DHARAVI PURIFICATION (HV) TEMP. DSS	0	0	0	Aug-22
12	DHOBIGHAT NO. 3 DSS	1	995	0.995	Oct-22
13	DHOBIGHAT NO. 5 DSS	1	995	0.995	Oct-22
14	NISARG SRA CHS DSS	1	995	0.995	Oct-22
15	ARANYA TOWER NORTH DSS	2	630	1.26	Feb-23
16	TEMP DSS CPWD	1	995	0.995	Feb-23
17	OMKAR REHAB DSS	1	630	0.63	Feb-23
18	FORTUNE VIEW DSS	1	630	0.63	Mar-23
19	SADGURU DELUXE DSS	1	995	0.995	Mar-23
20	JEWEL CREST DSS	1	630	0.63	Mar-22
21	Rare Villa DSS	1	630	0.63	Apr-22
22	INT Theater DSS	2	630	1.26	Apr-22
23	The Primodial House DSS	1	995	0.995	May-22
24	Aman Grih DSS	1	995	0.995	May-22
25	NCPA Apartment DSS	4	630	2.52	Sep-22
26	Sammet Shikhar DSS	1	630	0.63	Oct-22
27	State Excise DSS	1	995	0.995	Jan-23
28	Earth Anand DSS.	1	630	0.63	Feb-23
29	**A.K.Railway Residance DSS**	1	995	0.995	Feb-23
30	ITI MANDVI DSS	1	995	0.995	Mar-23
31	Siddharth Nagar DSS	1	630	0.63	Mar-23
32	**Sicka Nagar DSS**	1	630	0.63	Mar-23
33	"Girgaon Metro DSS" (Temp.)	1	995	0.995	Oct-22
34	Grant Road Metro DSS	1	995	0.995	Dec-22
35	Annapurna DSS	1	630	0.63	Feb-23
36	Chandan Signature DSS	1	630	0.63	Feb-23
	TOTAL	**45**		**34.215**	**MVA**

REPLACEMENT OF X'ERS (HIGHER CAPACITY) DURING FY 2022-23 (Table-B)					
SR. No.	NAME OF THE DSS	New	Old	Added	Month of
1	SKY FOREST 'F' DSS	1600	630	970	Sep-22
2	NUGGET DSS	995	630	365	Sep-22
3	JACOB CIRCLE DSS	995	630	365	Feb-23
4	CEMTEC DSS	995	630	365	Feb-23
5	Raibhavan	630	400	230	April -22
6	Cold Storage DSS	995	630	365	Jun-22
7	Sachivalava Annexe	1600	995	605	Jun-22
8	M.L.Dahanukar Marg DSS	995	630	365	Aug-22
9	Stable Street DSS	1600	995	605	Aug-22
		10405	**6170**	**4.24**	

REMODELLING OF DSS DURING FY 2022-23 (Table-C)					
SR. No.	NAME OF THE DSS	No. of X'ers	Capacity In	Month of	
1	GAWALIA CHAWL LANE DSS	1	630	Jan-23	
2	NCPA North DSS	1	1600	Sep-22	
3	NCPA South DSS	1	995	Sep-22	
4	Krishna Cinema DSS	1	630	Feb-23	
5	BEST MARG	1	1600	Dec-22	
6	Hindustan Leaver DSS.		1601	Oct-22	
7	Atur Apartment		1602	Feb-23	

INSTALLATION OF ADDITIONAL X'ERS DURING FY 2022-23 (Table-D)					
SR. No.	NAME OF THE DSS	No. of X'ers	Capacity	Added	Month of
1	LODHA CLUB HOUSE DSS NO. 3	1	995	1.00	Apr-22
2	Narayan Dabholkar Marg East	1	630	0.63	Jun-22
3	Siddharth Nagar DSS	1	1600	1.60	Mar-23
		3		3.23	

REPLACEMENT OF X'ERS (UNDER FAULT & 25 YEARS ABOVE) DURING FY 2022-23 (Table-E)					
SR. No.	NAME OF THE DSS	New	Old	Added	Month
1	LIBRARY ROAD	995	995	0	May-22
2	VINCENT DSS	995	995	0	May-22
3	FINE TOUCH DSS	630	630	0	Jun-22
4	NSCI DSS	630	630	0	Jul-22
5	DIGNOSTIC CENTER	630	630	0	Jul-22
6	KUSSARA STATIC	630	630	0	Aug-22
7	OMKAR TEMP. DSS	995	995	0	Aug-22
8	NUGEET DSS	630	630	0	Sep-22
9	MOON MILL DSS	995	995	0	Sep-22
10	BANWARI COMPOUND	1600	1600	0	Oct-22
11	BHARITYA KAMALA NAGAR	1600	1600	0	Nov-22
12	NAIGAON DSS	630	630	0	Nov-22
13	SHAHID NAGAR	630	630	0	Jan-23
14	SANGAM NAGAR	2 X 1600	2 X 1600	0	Mar-23
15	Cavel Street DSS	995	995	0	Aug-22
16	S K Patil Udyan DSS	995	995	0	Aug-22
17	Jail Rd (East)DSS.	995	995	0	Oct-22
18	Sahyadri Gaust House	995	630	365	Oct-22
19	Nepeansea North	995	630	365	Oct-22
20	Veer Bhavan	630	630	0	Oct-22
21	Marine Drive (East)	995	955	0	Nov-22
22	Marzaban Road DSS	995	995	0	Nov-22
23	LIC DSS	1600	1600	0	Dec-23
		20785	20015	0.73	
NET ADDITION 0.77 MVA					

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080

Email ID : depro@bestundertaking.com

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

ESO/AGM(ES)/CEPL/261 /2024

DATE : 19 DEC 2024

The Secretary,
Maharashtra Electricity Regulatory Commission
13th floor, Centre No.1,
World Trade Centre, Cuffe Parade, Colaba
Mumbai 400 005

Sub: Submission of Cost Benefit Analysis (CBA) for FY 2023-24

Sir,

With reference to above subject, BEST is submitting herewith Cost Benefit Analysis (CBA) for FY 2023-24 for the Hon'ble Commission's consideration, please.

Thanking you,

Yours faithfully,

19/12/24

(S. D. Chougule)
Divisional Engineer
Planning (Material) Dept

BEST's Submission of COST BENEFIT REPORT FOR FY-2023-24

1.0 The details of Capital Expenditure incurred during FY 2023-24 are as follows.

Table 1: Details of proposed Capital Expenditure& Actual Capitalisation during FY 2023-24

Scheme No.	Project schemes	Capitalisation FY 2023-24 (Rs. Cr) (As per approved DPR)	Actual Capitalization FY 2023-24 (Rs. Cr)
DPR-I	New Receiving Station (110 kV &33-22/11 kV)	5.26	0.74
DPR-II	Revamping at existing RSS	1.61	9.72
	N-DPR Schemes- (New RSS/ Revamping at existing RSS)	-	2.10
DPR-III	New DSS Commissioning, Augmentation & alteration to existing DSS	29.95	38.18
DPR-IV	Extension of Dist. Network (laying of HV and LV lines)	49.24	48.05
DPR-V	Distribution Automation, SCADA and BPA	-	-
DPR VI	Energy Meters	-	-
	RDSS	736.94	13.00
Non-DPR Schemes	Street lighting (lamps & cables)	-	3.51
	G.A. Expenses (Furniture, office equipment, Tools, Civil works, Motor works etc.)	-	13.42
	Total	**823.00**	**128.72**

For detail approved capitalisation refer, Annexure-A, Pg. No.3, 9, 19 & 24 and for actual capitalisation refer, Annexure-A, Pg. No.36.

2.0 Scheme -I: New Receiving Substations (110 kV &33-22/11 kV)

2.1 The projected capitalisation proposed during FY 2023-24 **Amt in Cr.**

Sr. No.	Scheme No. &work at RSS	MERC Approval No. & Date	Projected Capitalisation FY 2023-24
1	**BEST/FY21/01**: Commissioning of RSS at Pimpalwadi, Spring Mill Chawl (Bombay Dyeing) & Bharat Potdar Mill (India Blu)	MERC/CAPEX/FY2020-21/- dated 16.07.2020	5.76
	Total		**5.76**

For projected capitalisation refer Annexure-A, Pg. No. 3.

2.1.1The Projected benefit on implementation of the above schemes (for new RSS):

Sr. No.	Scheme No. & work at RSS	MERC Approval No. & Date	Projected Cost Benefit for FY 2021-22 (Rs. In Crore)
1	**BEST/FY21/01**: Commissioning of RSS	MERC/CAPEX/FY2020-21/- dated 16.07.2020	2.00
	Total		**2.00**

Refer Annexure-B, Pg. No.1.

Projected additional revenue realisation = 2.00 Cr

2.1.2 **Calculations of RoE for FY 2023-24 (Case No. 212 of 2022 dtd.31.03.2023)**

Return on Equity for FY2023-24 = Rs.143.82 Cr) Refer ------- Annexure-B, Page No.12.

Distribution Loss = 4.18% ------- Annexure-B, Page No.9

Energy sale = 4772.81 Mus. ------- Annexure-B, Page No.9

R0E per unit = $143.82 \text{ X } 10^7 / 4772.81 \text{ X } 10^6 = 0.301$

For calculation of RoE per unit, the values of RoE, Distribution Loss, Energy Sales are taken from the approved Copy of MERC Order Case No. Case No.212 of 2022 dtd.31.03.2023 and same is enclosed as ***Annexure –B Page No. 2-10.***

2.1.3 Projected cost benefit as proposed in the DPR Scheme No. BEST/FY-21/01 due to commissioning of 16 MVA T/Fs at new RSS:

For calculation purpose it is assumed that in the first year of commissioning a new T/F shall be loaded to the extent of 20%, in the 2nd year at 30%, in the 3rd year at 40%, in the 4th year 50% and finally in the 5th year at about load factor i.e. 58.97% for FY 2019-20.

No. of units realized in FY 2023-24 = Load * Power Factor* Incremental load* No. of hours per day * No. of days * (1- Distribution Loss)

= (16* 0.99 * 50% * 24 * 365 * 1000 * (1-0.0418%)/10^6)

= 66.48 Mus.

RoE per unit = 0.301

Additional Revenue allocated in FY 2021-22 = $65.96 \times 0.301 \times 10^6 / 10^7$

= 2.00 Cr.

2.2 **The actual capitalisation accrued during FY2023-24 as against above projections:**

2.2.1 **Commissioning of New RSS:** During the FY 2023-24, there is no capacity addition, since no power transformers are commissioned under New RSS Schemes.

3.0 Scheme –II: <u>Augmentation / Replacement at existing Receiving Sub Stations</u>

3.1 Projected capitalisation as per approved DPRs shall be as given in the following table:

Sr. No.	Scheme No. & work at RSS	MERC Approval No. With Date	Amount capitalised (Rs. Cr)
1.	**Scheme No. BEST/FY-20/02**: Revamping of existing RSS	MERC/CAPEX/2020-21/553 dt.15.12.2021	1.61
	Total amount to be Capitalised		**1.61**

Annexure-A Page No. 9 & 30.

3.1.1 **Calculations of RoE for FY 2023-24 (Case No.212 of 2022 dtd.31.03.2023)**

Return on Equity for FY2023-24 = Rs.143.82 Cr Refer Annexure-B, Pg. No.12.

Distribution Loss = 4.18% Refer Annexure-B, Pg. No.9

Energy sale = 4772.81 Mus. Refer Annexure-B Pg. No.9

ROE per unit = 143.82 X 10^7 / 4772.81 X 10^6 = 0.301

For calculation of RoE per unit, the values of RoE, Distribution Loss and Energy Sales are taken from the approved Copy of MERC Order Case No. Case No.212 of 2022 dtd.31.03.2023 and same is enclosed as **Annexure –B, Pg. No. 2-10.**

3.1.2 Projected cost benefit as proposed in the DPR Scheme No. BEST/FY-20/02) due to augmentation at existing RSS:

For calculation purpose it is assumed that in the first year of commissioning a additional T/Fsat RSS shall be loaded to the extent of 20%, in the 2nd year at 30%, in the 3rd year at 40%, in the 4th year 50% and finally in the 5th year at about load factor i.e. 59.64%.

Further to this, it is assumed that 10 MVA T/Fs replaced by 16 MVA at existing RSS shall be loaded to the extent of 20% of added capacity in first year, in the 2nd year at 30%, in the 3rd year at 40%, in the 4th year 50% and finally in the 5th year at about load factor i.e. 59.64%.

Nos. of projected Units to be realised in FY2021-22 shall be as follows:

= Load * Power Factor * Incremental load * No. of hours per day * No. of days * (1- Distribution Losses)

= [16*0.99*50%*24*365*1000*(1-0.0418)/10^6 + [32*0.99*40%*24*365*1000*(1-0.0418)/10^6]

= (66.48 + 106.37) Mus = 172.85 MUs

RoE per unit = 0.306

Additional Revenue allocated in FY 2023-24 = 172.85 X 0.301 X 10^6 /10^7

= 5.21 Cr (kindly refer Annexure-B, Pg. No. 14)

Wherein Capacity increased = NIL MVA, Incremental loading =40%, Distribution Loss = 4.18%.

The projected Additional Revenue realisation = Rs.5.21 Cr.

3.2 The actual capitalisation accrued during the FY2023-24 as against the above projections:

Sr. No.	Scheme No. and works at RSS	Capacity addition (MVA)	MERC Approval No. & Date	Amount capitalised (Rs. Crs.)
1.	**BEST/FY-16/02** (1) Earthing at Mazgaon Dock, Kussara& Worli RSS (2)Minor civil work & NIFP at Kussara(3) Battery set installed at Worli RSS (4) 33 kV switchgear installation at Worli Dairy RSS.	-	MERC / CAPEX /2017-18 / 4706 dated 16.11.2017	0.00
2.	**BEST/FY-17/02** (1) Earthing at PMGP (2) Replacement of Battery & Battery Charger at Khetwadi & G T Hospital (3) Installation of CO_2 Type AFF system at 110 kV Backbay and Nariman Point. (4) Laing of 33kV cable at TPC Carnac, Backbay, Kingsway & Girgaon.	-	MERC / CAPEX/ 2017-18 / 4706 dated 16.11.2017	5.37
3.	**BEST/FY-18/02** (1) Earthing at Ballard Estate (2) Replacement of Battery and Battery Charger at Lalbaug, 110 kV DBA, Worli Dairy, Peninsula & Sion Fort.	-	MERC/CAPEX/2017-18/4706 dated 16.11.2017	1.96
4.	**BEST/FY-20/02** (1) Civil work at Nepean Sea, Kingsway, Parel & Elphinstone Mill (2) Earthing at Colaba & Mahalaxmi (3) Installation of switchgears at Elphinstone Mill (4) T/F installation at Kingsway RSS (5) 11 kV switchgears installation at Parel & Kingsway (6) Replacement of Battery and Battery Charger at Ballard Estate (7) AFF System installation at Khetwadi, Byculla, Sewree, Sitaladevi, Mahim C'way, Naval Dock & Hutatma Chowk.	16	MERC/CAPEX/2020-21/553 dated 15.12.2021	2.38
5.	**BEST/FY-21/02** (1) Civil work at Byculla (2) Earthing and 33 kV switchgear at Mahim C'way (3) T/F replacement at Byculla (4) 33 kV cable at DBA & Mahalaxmi.	-	MERC/CAPEX/2022-23/0556 dated 14.11.2022	0.01
	Total in Cr	**16**		**9.72**

Refer Annexure-A, Pg. No. 36.

3.3 Actual Benefits achieved during FY 2023-24:

The actual cost benefit realised due to augmentation / replacement of Power Transformers at following places:

NAME OF RSS	Year of Commissioning	Date of commissioning	Days of operation	Load (MVA)	Energy Units realized MUs.	RoE	Revenue realized (Rs. Cr)
PMGP T/F-4	2023	22.08.2023	222	3.2	16.17	0.301	0.49
TOTAL				**3.2**	**16.17**	**0.301**	**0.49**

ROE/Unit for FY 2023-24 = $143.82*10^7 / 4740.15*10^6 = 0.303$

Revenue Realized = (Units Realised)*ROE/Unit = 0.303

For PMGP RSS Tr. No.4

Units realized in MU =Load(MVA)*Load Factor*P.F.*24*days of operation*(1- Dist. loss)*10^3/10^6

$=3.2*0.99*24*222 * (1-0.0418) X1000 /10^6 = 16.17$ Mus

Additional Revenue allocated in FY 2023-24 = $16.17 X 0.303 X 10^6/10^7 = 0.49$ Cr

Actual Benefits of Rs. 0.49 Cr is achieved as against projected revenue realisation of Rs.5.21 Cr during FY 2023-24.

4.0 Capitalisation occurred during FY 2022-23 as against Non-DPR Schemes:

Sr. No.	Non-DPR Scheme work	Capacity addition (MVA)	Amount capitalised (Rs. Cr.)
1.	1) Replacement of 11 kV Bus Section at Sitaladevi RSS 2) Replacement of AFF system at Raoli Hill , Worli Dairy, Colaba & Pochkhanwala Road RSS 3) Installation of earthing was done at Apollo, Malbar Hill, Cumballa Hill , Grant Road , Masjid, Love Grove, Mumbadevi, Sewree, Marine Drive & Pratiksha Nagar RSS. 4) Replacement of Battery & Battery Charger at Esplanade, Sewree, Raoli Hill, Prabhadevi, Masjid, Lalbaug, Peninsula Land, Girgaum & Nariman Point RSS	-	2.10
	Total in Crs	-	**2.10**

Refer A, Page No. 36 (Sr. No. 17).

5.0 Scheme -III: New Distribution Substation Commissioning, Augmentation & Alteration to existing DSS

5.1 **Projected capitalisation proposed during FY 2023-24 as against DPR Scheme CodeNo. BEST/FY21/03**

PARTICULARS	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Capex for the scheme, Rs. in Cr. (40 DSS in each year)	**30.20**	**29.95**	**29.95**	**29.95**	**29.95**
Capacity proposed to be installed (in MVA)	49.205	50.20	51.80	**53.765**	55.755
Total Transformer Nos.	68	70	72	**74**	77
Amount proposed to be capitalised (in Rs. Crore)	**30.20**	**29.95**	**29.95**	**29.95**	**29.95**

Refer Annexure-A, Pg. No.19. For detail MVA Capacity kindly refer Annexure-C, Page No.1.

5.1.1 **During the FY 2023-24, the proposed distribution transformer capacity addition was as follows:**

1) **Capacity addition by commissioning of New DSS:** During the year, it was proposed to commission 43 nos. of new DSS, having 43 nos. of DTs of capacities 630 kVA (22 Nos.), 995 kVA (13 Nos.) and 1600 kVA (8 Nos.) aggregating to total capacity addition as 39.60 MVA (Kindly refer Annexure-C, Page No.1).

2) **Capacity addition by Tr. Replacement**

During the year it was proposed to replace 1 no. of 400 KVA DT with 630 KVA DT leading to a capacity addition of 230 KVA (0.230 MVA) per transformer and 0.23 MVA in total, 21 nos. of 630 KVA DTs with 995 KVA DTs leading to a capacity addition of 365 KVA (0.365 MVA) per DT and 7.665 MVA in total, and 5 nos. of 995 KVA DTs with 1600 KVA DTs leading to a capacity addition of 605 KVA (0.605 MVA) per DT and 3.025 MVA in total. Due to 27 nos. of DTs replacement with higher capacity, total capacity addition will be 10.92 MVA (Kindly refer Annexure-C, Page No.1).

3) **Capacity addition by Additional transformer**

During the year, it was proposed to install 2 nos. of additional DTs of 630 KVA leading to a total capacity addition of 1.26 MVA and 2 nos. of additional DTs of 995 KVA leading to a total capacity addition of 1.99 MVA. Due to installation 4 nos. of DTs total capacity addition will be 3.25 MVA (Kindly refer Annexure-C, Page No.1).

During the year, total capacity addition to the system by augmentation work would be the sum of capacity addition by commissioning new DSS and replacement/ addition of DTs

= 39.60 MVA + 10.92 MVA+ 3.25MVA

= 53.765 MVA

The projected capacity addition during FY 2023-24 = 53.765 MVA

No. of units realised = load (MVA)*Load Factor*Power Factor*(1-loss)*24*365*1000
= (53.765) *0.20*0.5964*0.99*(1-0.0418)*24*365*1000/10^6
= 53.29 Mus.
Projected no. of units realised due to capacity addition: 53.29 Mus.
RoE per unit for FY 2023-24=$143.82*10^7/4772.81*10^6 = 0.301$

Revenue Realised = Units * RoE per unit
= $53.29*10^6*0.301/10^7$
= 1.60 Cr.

During the FY 2023-24, projected cost benefit was Rs.1.60 Cr as against DPR Scheme BESTFY21/03.

5.2 The projected capitalisation accrued during FY 2023-24 as against the above projections:

Sr. No.	No. of DSS	DPR submission to MERC (ref. No.)	Amount capitalised (Rs. Crore)
1	New DSS (40 Nos.)	Scheme No. BEST/FY-21/03	29.95
	Total cost		**29.95**

Refer Annexure-A, Page. No.19

5.2.1 The actual capacity addition during FY 2023-24 as against the above projections is as follows:

1) Actual Capacity additions and load by new DSS commissioning(Annexure-C, Pg. No. 2)

In FY 2023-24, total 30 Nos. of New DSS are commissioned. A list of 30 Nos. of DSS commissioned in 2023-24 with details of installed capacity is enclosed as Annexure-C, *Pg. No.2 (Table-A)*.

An actual Capacity addition due to commissioning of new 30 Nos. of DSS is (630kVA -10 Nos., 995 kVA- 11 Nos., Replacement of Battery & Battery Charger at Esplanade, Sewree, Raoli Hill, Prabhadevi, Masjid, Lalbaug, Peninsula Land, Girgaum & Nariman Point RSS. 1600 kVA- 12 Nos. & 2000 kVA-1 Nos.) 38.445 MVA and load is 7.69 MVA (assuming 20% loading).

2) **Actual Capacity addition by DT Replacement with higher capacity (*Annexure- C*), *refer Pg. No. 3 (Table-B)*.**

a) 1 Nos. of 400 kVA DTs is replaced with 995 kVA DT leading to a capacity addition of 595 KVA (0.595 MVA) and **0.595** MVA in total.
b) 11Nos. of 630 kVA DTs are replaced with higher capacity. Out of 11 nos. of 630 KVA DTs, 9 nos. of DT's are replaced with 995 kVA and balance 2 nos. of DT replaced with 1600 kVA leading to a capacity addition of 365 KVA (0.365 MVA) & 970 kVA (0.970 MVA) per DT and **5.225** MVA in total.

c) 4 No. of 995 kVA DT's are Replaced with 1600 kVA DT leading to a capacity addition of 605 KVA (0.605 MVA) per DT and **2.42** MVA in total.

Actual Capacity addition by replacement of 16 nos. of DTs with higher capacity DTs leading to a capacity addition of **8.24** MVA in total.

3) **Actual Capacity addition by Additional transformer (Annexure-C, Table-D & Table-E, Pg. No. 3 & 4).**

1 Nos. of each 630 kVA & 1600 kVA and 2nos. of 995 kVA additional DTs are installed during F.Y. 2023-24 and results **4.22** MVA capacity additions in total.

Further to this, due to R&M, 2X630 kVA DT are replaced with 995 kVA DT's, leading to net capacity addition as **0.73** MVA.

Thus, total capacity addition due to additional DT and DT replaced under R&M is **4.95** MVA

The actual total capacity addition to the system by augmentation work would be the sum of capacity addition by commissioning new DSS and replacement/ addition of transformers
= 38.445 MVA + 8.24 MVA + 4.95 MVA
= 51.635 MVA
Load due to this capacity addition is 10.33 MVA (assuming 20% loading of 51.635 MVA)

5.2.2 The no. units realised due to capacity addition due to commissioning of new Distribution Substation (DSS) &Augmentation, alteration to existing DSS are as follows:

No. of units realised = load (MVA)*Load Factor*Power Factor*(1-loss)*24*365*1000/10^6
= 51.635 *0.5964*0.99*20% *(1-0.0412)*24*365*1000/10^6
= 51.21 Mus.
<u>Formula & Sample calculation</u>:

As per case 212 of 2022, ROE (apprd. By MERC for FY2023-24) =143.82 Cr (***Refer Annex-B, Pg. No.12***).

Actual Unit's sales during FY2023-24 are 4740.15 Mus as against MERC approved **<u>4772.81</u>** Mus ***(Refer Annexure- B, Pg. No. 13).***

RoE per unit for FY 2023-24=$143.82*10^7/4740.15*10^6 = 0.303$

Revenue Realised = Units * RoE per unit

$= 51.21*10^6*0.303/10^7$

= 1.55 Cr

Actual Benefits of Rs. 1.55 Cr is achieved as against projected revenue realisation of Rs.1.60 Cr during FY 2023-24.

6.0 Scheme -IV: Extension of Distribution Network (laying HV/LV Lines)

6.1 Projected phasing of capitalisation in the Scheme BEST FY21/04

PARTICULARS (Amt. In Cr)	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Capex for the scheme	49.24	**49.24**	49.24	49.24	49.24
Amount proposed to be capitalised	49.24	**49.24**	49.24	49.24	49.24

Refer Annexure-A, Pg. No. 24.

6.1.1 Projected capitalisation proposed during FY 2023-24 (DPR Scheme Code No. BEST/FY21/04), (*Annexure-A, Page No. 28)*

Sr. No.	PARTICULARS OF EQUIPMENTS	Km/ Nos.	Amount (Rs. Cr)
A	Laying of HV cable	25.00	6.41
B	Laying of LV cable	56.00	11.39
C	RI Charges	24.27	18.71
D	Installation of new pillars	135	1.28
E	Laying of service cables & associated equipments	40.00	11.45
	Total		**49.24**

Refer Annexure-A, Pg. No. 26.

6.1.2 Computation of revenue from additional sales

Particulars	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Cumulative capacity commissioned (MVA)	49.205	50.20	51.80	**53.765**	55.755
Incremental Loading (%)	20%	30%	40%	**50%**	58.01%
Distribution losses (%)	4.18%	4.18%	4.18%	**4.18%**	4.18%
System Power factor	0.9822	0.9822	0.9822	**0.9822**	0.9822
Additional sales (MU)	81.14	204.98	371.86	**585.18**	838.04
ROE per Unit (Rs/unit)	0.279	0.278	0.277	**0.277**	0.276
Total Revenue (Rs. Crore)	2.26	5.71	10.32	**16.18**	23.09

For Capacity addition, refer Para 5.1. **Projected cost benefit during FY 2023-24.**

Actual Benefits of Rs. 16.18 Cr is achieved as against above scheme No. BEST/FY21/04 (Kindly refer above table)

5.2 The actual capitalisation accrued during FY 2023-24 as against the above projections.

Sr. No.	Particulars of Equipments	DPR submission to MERC (ref. No.)	Amount capitalised (Rs. Cr)
A	**Scheme No. BEST/FY-21/04**		
1	Laying of HV cable (18.69km)	MERC/CAPEX/2020-21/- dated 22.06.2020	7.46
2	Laying of LV cable (60.92 km)		13.83
3	Installation of ADPs (212 nos.)		1.19
4	Laying of service cables (32.39)		9.56
5	R.I. Charges		15.83
6	Material Transport Charges		0.18
	TOTAL		**48.05**

During FY 2023-24, for extension of distribution network, Rs.48.05 Cr actual capitalisations are accrued as against the projected capitalisation of Rs. 49.24 Cr.

7.0 Scheme -6: Energy Meters:

During FY 2023-24, there was no approved scheme for Energy Meters.

8.0 COST BENEFIT OF OVERALL SYSTEM

For all incremental sales to be realized, the RSS would require simultaneous commissioning of Distribution Sub stations, cabling and augmentation of existing infrastructure. We assume that the benefit from adding these components is in the same proportion as the current Capital Expenditure proposed towards the total system expansion and augmentation. This includes expenditure proposed in Project Schemes I (New RSS), II (Revamping of existing RSS), Non-DPR, III (New DSS & revamping of Existing DSS), IV (Strengthening of HV LV network) and V (Energy Meter) amounting to Rs. 180.49 Cr it includes capital expenditure towards Non-DPR Schemes, Revamping of RSS, BPA, Street Lighting & General Administration.

Therefore the overall cost benefit due to Strengthening of Network due to execution of work under schemes I, II, III, IV & Non-DPR are calculated as follows.

= (Additional Units realised in MUs due to Scheme I, II Non-DPR)*(RoE/Unit)*10^6*/10^7
Revenue due to Scheme VI

Additional units realised due to Commissioning of 1 No. of T/F in New RSS = 0.20 Mus
Additional units realised due to Augmentation / replacement of Power transformers = 13.47 Mus
Additional units realised due to Non-DPR Scheme 15.75 Mus
Additional units realised due to New DSS Schemes= 42.32 Mus

RoE per Unit =0.303
Overall Cost Benefit = (16.17+51.21)*0.303*10^6)/10^7
= (67.38*0.303*10^6) /10^7
= 2.04 Cr

8.1 We have apportioned the cost benefit of Rs. 2.04 Cr to 5 schemes in proportion of the Capex of each scheme as follows:

All amounts in Cr.

NAME OF SCHEME	CAPEX	SCHEME CODE	% OF TOTAL CAPEX	BENIFITS PROJECTED IN DPR	BENEFITS ACHIEVED
New Receiving Substation of 110 kV & 33-22kV/11 kV	0.74	**Scheme No.** BEST/FY-16/01 BEST/FY-21/01	0.75%	2.00	0.02
Augmentation / Replacement at existing RSS (Revamping RSS)	9.72	**Scheme No.** BEST/FY-17/02 BEST/FY-18/02 BEST/FY-20/02 BEST/FY-21/02	9.84%	5.21	0.20
New Dist. Sub. Commissioning & alteration to Existing DSS	38.18	**Scheme No.** BEST/FY-21/03	38.65%	1.60	0.79
Extension of Dist. Network (Laying of HV/LV Lines)	48.05	**Scheme No.** BEST/FY-21/04	48.64%	16.18	0.99
Revamping of RSS	2.10	Non-DPR : Aug. of RSS	2.13%	-	0.04
Energy Meters	-	Non-DPR : Energy Meters	-	-	-
Total	**98.79**		**100 %**	**24.99**	**2.04**

9.0 Benefits of CAPEX Schemes:

The Maximum Demand for FY 2023-24 = 956 MVA.

The total capacity of Power Transformer in the system for FY 2023-24 = 2327 MVA

(***Refer Annexure-B, Page No.13***).

The total capacity of Distribution Transformer in the system for FY 2022-23= 2892 MVA.
By execution of network strengthening schemes we have maintained a ratio of,
Total capacity of Power Transformers in system/Maximum Demand = 2327 MVA/ 956 MVA =2.43
Total capacity of Dist. Transformers in system/Maximum Demand = 2892 MVA / 956 MVA = 3.03

These system parameters ensure reliable and quality power supply to the consumers.

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Annexure-A

महाराष्ट्र विद्युत नियामक आयोग
Maharashtra Electricity Regulatory Commission

No. MERC/CAPEX/ FY 2020-21/ **16 July, 2020**

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject: In-principle clearance for the DPR of BEST for "Commissioning of 33/11 KV New Receiving Stations at Pimpalwadi, Spring Mill Chawl (Bombay Dyeing Plot) and Bharat Potdar Mill (India Blue)"(Rs 27.40 Crores)

Sir,

This has reference to your submitted DPR for "Commissioning of 33/11 KV New Receiving Stations at Pimpalwadi,Spring Mill Chawl (Bombay Dyeing Plot) and Bharat Potdar Mill (India Blue)", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1 I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2 No escalation in the unit cost has been considered.

3 The IDC shall be considered after execution of the project at time of tariff Petition.

4 Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BESTwill be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5 BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

१३वा मजला, केंद्र क्र. १, जागतिक व्यापार केंद्र, कफ परेड, कुलाबा, मुंबई - ४०० ००५.
13th Floor, Centre No. 1, World Trade Centre, Cuffe Parade, Colaba, Mumbai - 400 005.
Tel.: 022-2216 3964 / 2216 3965 / 2216 3969 Fax : 022-2216 3976
E-mail : mercindia@merc.gov.in / mercindia@mercindia.org.in Website : www.merc.gov.in / www.mercindia.org.in

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BESTshould communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

Yours faithfully,

Sd/-
(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure A

Feasibility Report for Capital Investment Scheme for BEST

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Title (Name of Scheme)</td><td>Commissioning of 33/11 KV New Receiving Stations at Pimpalwadi, Spring Mill Chawl (Bombay Dyeing Plot) and Bharat Potdar Mill (India Blue)</td></tr>
<tr><td>2</td><td>Brief Scope of work</td><td>a. Installation of 33/11 kV, 1x16 MVA transformers.
b. Installation of 33 kV, 11 kV switchgears and accessories.
c. Laying of 33kV cables.
d. Installation of battery & battery charger.
e. Associated civil work for constructing new Receiving Substation.
f. Provision for Air conditioning at control room
g. Provision of Automatic Fire Fighting System.</td></tr>
<tr><td>3</td><td>Objective / Justification</td><td>(i) 24x7 power supply for consumers in Mumbai City.
(ii) To meet increasing load demand in existing areas of supply.
(iii) To improve quality and reliability of supply..</td></tr>
<tr><td>4</td><td>Estimated Cost</td><td>Rs. 27.58 Crore</td></tr>
<tr><td>5</td><td>In-principle approval accorded</td><td>Rs. 27.40 Crore</td></tr>
<tr><td>6</td><td>Cost benefit analysis</td><td>Benefits of Rs 0.74 Crores in the 1st year, going up to Rs.3.56 Crores in the 5th year</td></tr>
<tr><td>7</td><td>Approved Phasing</td><td>
<table>
<tr><th>S. N.</th><th>Particulars</th><th>FY 2020-21</th><th>FY 2021-22</th><th>FY 2022-23</th><th>FY 2023-24</th><th>FY 2024-25</th></tr>
<tr><td>1</td><td>Capital Expenditure in Rs Cr</td><td>5.97</td><td>7.46</td><td>5.71</td><td>5.26</td><td>3.00</td></tr>
<tr><td>2</td><td>Capitalisation in Rs Cr</td><td>5.97</td><td>7.46</td><td>5.71</td><td>5.26</td><td>3.00</td></tr>
<tr><td>3</td><td>IDC</td><td colspan="5">NIL (shall be considered after execution of the project at time of tariff Petition)</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	a. To meet increasing load in existing areas of supply. b. Build & maintain adequate redundancy in the system c. 24x7 power supply for consumers in Mumbai City. d. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking e. To maintain reliability and quality of Electric Supply to the Consumers.
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 0.74 Crores in the 1st year, going up to Rs.3.56 Crores in the 5th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

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Appendix –A

Cost Abstract

Pimpalwadi RSS:-

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
1	Power Transformer 16 MVA, 33/11kV with NIFP System	1	146.31	146.31
2	Primary Switchgear 33kV, 1500 MVA SF6 VCB	1	10.41	10.41
3	Secondary Switchgear 11kV 350 MVA (1 set of 9 breakers)	1	37.82	37.82
4	Control, alarm & relay panel with FRLS control cable	1	17.55	17.55
5	Battery Charger	1	4.74	4.74
6	Battery	1	4.06	4.06
7	HT Capacitor	1	13.30	13.30
8	HT Reactor	1	12.96	12.96
9	Earthing works	1	20	20.00
10	Air-conditioning for control room	1	2	2.00
11	Automatic Fire Fighting System	1	25.62	25.62
12	33KVcable laying including R.I. charges	0	182.26	0.00
13	Civil Work	0	0	0.00
	Total cost in Lakh			**294.77**
	Contingency 5%			**14.74**
	Grand Total in Crore			**3.10**

Spring Mill Chawl (Bombay Dyeing):-

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
1	Power Transformer 16 MVA, 33/11kV	1	146.31	146.31
2	Primary Switchgear 33kV, 1500 MVA SF6 VCB	1	10.41	10.41
3	Secondary Switchgear 11kV 350 MVA (1 set of 9 breakers)	1	37.82	37.82
4	Control, alarm & relay panel with FRLS control cable	1	17.55	17.55
5	Battery Charger	1	4.74	4.74
6	Battery	1	4.06	4.06
7	HT Capacitor	1	13.30	13.30
8	HT Reactor	1	12.96	12.96

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
9	Earthing works	1	20	20
10	Air-conditioning for control room	1	2	2
11	Automatic Fire Fighting System	1	25.62	25.62
12	33KVcable laying including R.I. charges	5.18	182.26	930.12
13	Civil Work	1	289.93	289.93
	Total cost in Lakh			**1514.82**
	Contogency 5%			61.24
	Grand Total in Crore			**15.76**

Bharat Potdar Mill RSS:-

Sr. No	Particulars	Qty.	Unit Cost (Rs. Lakh.)	Total (Rs. Lakh)
1	Power Transformer 16 MVA, 33/11kV	1	146.31	146.31
2	Primary Switchgear 33kV, 1500 MVA SF6 VCB	1	10.41	10.41
3	Secondary Switchgear 11kV 350 MVA (1 set of 9 breakers)	1	37.82	37.82
4	Control, alarm & relay panel with FRLS control cable	1	17.55	17.55
5	Battery Charger	1	4.74	4.74
6	Battery	1	4.06	4.06
7	HT Capacitor	1	13.30	13.30
8	HT Reactor	1	12.96	12.96
9	Earthing works	1	20	20
10	Air-conditioning for control room	1	2	2
11	Automatic Fire Fighting System	1	25.62	25.62
12	33KVcable laying including R.I. charges	1.35	179.56	242.41
13	Civil Work	1	289.93	289.93
	Total cost in Lakh			**827.11**
	Contogency 5%			26.86
	Grand Total in crore			**8.54**

महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

सत्यमेव जयते

MERC/CAPEX/2020-21/ 553 Date: 15 December, 2021

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject: In-principle clearance for the DPR of BEST for "Revamping of existing Receiving Substations FY 2019-20 to FY 2024-25"(Rs 40.60 Cr)

Sir,

This has reference to your submitted DPR for "Laying of HV and LV Cable and associated equipments", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2. No escalation in the unit cost has been considered.

3. The IDC shall be considered after execution of the project at time of tariff Petition.

4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BESTwill be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

11. It directed to keep in detail all records of its distribution assets in detail and shall ensure that the future DPRs shall be associated with detail asset information.

Yours faithfully,

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

(Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Feasibility Report for Capital Investment Scheme for BEST

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Title (Name of Scheme)</td><td>Revamping of existing Receiving Substations FY 2019-20 to FY 2024-25</td></tr>
<tr><td>2</td><td>Brief Scope of work</td><td>Alteration and augmentation of existing Receiving Substations
• Installation of additional transformers- Nepean Sea RSS and Kingsway RSS
• Replacement of - Grant Road RSS
• Installation of Additional RMU - Avighna RSS
• Replacement of 2nos. of AIS bus sections - Elphiston Mill RSS
• Replacement of 33 kV switchgears - Mazgaon Dock, Sion Fort, Dharavi, Mahim, Nepean Sea, Colaba and Kingsway RSS
• Replacement of 11 kV bus sections - Grant Road, Sewree, Parel, Kingsway, Prabhadevi, Mahalaxmi, Dharavi, Worli, Wadala, Mahim, KEM and Nair Hospital RSS
• Replacement / Installation of Capacitors - Cumballa Hill, Kingsway, Wadala, Worli Dairy, Sitaladevi and Sewree RSS.
• Replacement / Installation of Reactors - Cumballa Hill, Kingsway, Masjid, Hutatma Chowk, Grant Road, Kussara, Mahalaxmi and Sewree RSS.
• Replacement / Installation of Battery Set and charger - Grant Road, Nariman Point, Ballard Estate, Colaba, Hutatma Chowk, Mazgaon Dock and Nestle RSS. Mahalaxmi (only Battery Set)
• Replacement Fire Fighting System (WM Type) - Love Grove, Naval Dock RSS.
• Replacement Fire Fighting System (CO_2 Type) - Sitaladevi, Sion Fort, Hutatma Chowk, Mahim Causeway, Byculla, Sewree, Khetwadi RSS.</td></tr>
<tr><td>3</td><td>Objective / Justification</td><td>i) 24x7 power supply for consumers in Mumbai City.
(ii) reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking
(iii) To maintain reliability and quality of Electric Supply to the Consumers.</td></tr>
<tr><td>4</td><td>Estimated Cost</td><td>Rs. 40.60 Crore</td></tr>
<tr><td>5</td><td>In-principle approval accorded</td><td>Rs. 40.60 Crore</td></tr>
<tr><td>6</td><td>Cost benefit analysis</td><td>Benefits of Rs 0.74 Crores in the 2nd year, going up to Rs.5.02 Crores in the 6th year</td></tr>
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<table>
<tr><th>S. N.</th><th>Particulars</th><th>FY 2019-20</th><th>FY 2020-21</th><th>FY 2021-22</th><th>FY 2022-23</th><th>FY 2023-24</th><th>FY 2024-25</th></tr>
<tr><td>1</td><td>Capital Expenditure in Rs. Cr</td><td>15.78</td><td>8.75</td><td>8.52</td><td>2.32</td><td>1.61</td><td>3.62</td></tr>
<tr><td>2</td><td>Capitalisation in Rs Cr</td><td>15.78</td><td>8.75</td><td>8.52</td><td>2.32</td><td>1.61</td><td>3.62</td></tr>
<tr><td>3</td><td>IDC</td><td colspan="6">NIL (shall be considered after execution of the project at time of tariff Petition)</td></tr>
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<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	To meet increasing load in existing areas of supply. Build & maintain adequate redundancy in the system 24x7 power supply for consumers in Mumbai City. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking To maintain reliability and quality of Electric Supply to the Consumers..
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 0.74 Crores in the 2nd year, going up to Rs.5.02 Crores in the 6th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

-10-

Appendix –A

DESCRIPTION	TOTAL COST	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
allation of additional Power Transformers, 16 MVA, 33/11kV and associated ipments at Nepean sea RSS and Kingsway RSS (Qty-2).	13.03	6.56	3.46	3.01			
placement / Installation of 33/11kV, 16 MVA Power Transformer at Grant Rd. RSS r-1)	1.89	1.89					
tallation of additional 1 no. of 33kV, 1500 MVA RMU at Avighna, 33/0.415 kV S (Qty-1).	0.98	0.98					
placement / Installation of 33kV, 1500 MVA, AIS Bus Section at Elphiston Mill S (Qty-2).	0.98		0.98				
placement of 33kV, 1500 MVA primary switchgears at Mazgaon Dock (1 no.), n Fort (2 nos.), Colaba (1 no.), Nepean Sea (2 nos), Kingsway 2 nos.), Mahim (os), Dharavi (3 nos.) (QTY-13)	2.46		0.88	0.00	0.78	0.22	0.58
placement of 11 KV Bus Section, 350 MVA at Grant Rd (4), Sewree RSS, Parel S, (3 nos.each), Dharavi (2), Wadala (2), Kingsway (3), Mahim (2), Prabhadevi KEM(1), Worli(2), Mahalaxmi(3), Nair Hosp.(1) (Qty- 29 nos.).	12.70	2.83	1.56	4.35	0.61	0.78	2.58
placement / Installation of Capacitors at Cumballa Hill RSS, Kingsway RSS, dala RSS, Worli Dairy, Sitaladevi (1 no. each) and Sewree RSS (2 nos) (Qty- 7).	0.76			0.29	0.18	0.29	
placement / Installation of Reactors at Masjid RSS, Hutatma Chowk RSS, Grant ad, Cumballa Hill RSS, Kingsway RSS, Kussara RSS, Mahalaxmi RSS (1 no. each) Sewree RSS (2 nos.each). (Qty-9).	2.29			0.75	0.75	0.32	0.47
placement / Installation of Battery and charger at Grant Road, Nariman Point RSS, llard Estate RSS, Colaba RSS, Hutatma Chowk RSS, Mazgaon Dock RSS, aravi, Apollo (Qty-8)	0.68	0.48	0.08	0.12			
placement Fire Fighting System at Love Grove RSS, Naval Dock RSS (Water Mist pe, Qty-2).	3.04	3.04					
placement Fire Fighting System at Sitaladevi RSS, Sion Fort RSS, Hutatma owk RSS, Mahim Causeway RSS, Byculla RSS, Sewree RSS, Khetwadi RSS (CO2 pe Qty-7).	1.79		1.79				
TOTAL	**40.60**	**15.78**	**8.75**	**8.52**	**2.32**	**1.61**	**3.62**

महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

MERC/CAPEX/2022-23/0556

Date: 14 November, 2022

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject:In-principle clearance for the DPR of BEST for "Revamping of existing Receiving Substations during FY 2020-21 to FY 2022-23" for In-principle approval of the Commission and Post facto approval of capitalization during FY 2019-20"(Rs. 56.07 Cr).

Sir,

This has reference to your submitted DPR for "Revamping of existing Receiving Substations during FY 2019-20 to FY 2024-25" for In-principle approval of the Commission and Post facto approval of capitalization during FY 2019-20. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2. No escalation in the unit cost has been considered.

3. The IDC shall be considered after execution of the project at time of MYT/MTR tariff Petition.

4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BESTshould communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

11. It directed to keep in detail all records of its distribution assets and shall ensure that the future DPRs shall be associated with detail asset information.

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure "A"

Feasibility Report for Capital Investment Scheme for BEST

Sl. No.	Particulars	Details
1	Title (Name of Scheme)	**Revamping of existing Receiving Substations during FY 2019-20 to FY 2022-23**
2	Brief Scope of work	• Replacement of 10/12.5 MVA Power Transformers at Sitaladevi RSS Tr. No. 4, Byculla RSS Tr. No. 1 & 3 (Qty-3 Nos.) • Replacement of 33 kV switchgears at Mahim Causeway RSS(Qty-3 Nos.) • Diversion of 33 kV feeder cables of RSS viz.Wadala RSS (T/F. No. 1 & 3), Kingsway RSS (T/F. No. 2), Raoli Hill RSS (T/F. No.2), Sion Fort RSS (T/F. No. 2), Pratiksha Nagar (T/F. No. 1), Lodha Crown T6 (T/F. No. 1) from TPC Dharavi RS to TPC Antop Hill RS and laying of additional cables for proposed Pratiksha Nagar RSS (T/F2), Lodha Crown T6 (T/F2), Lodha Crown T10 (T/F1&2) and New RSS commissioning at Dosti Acres (Qty. 16.961 Kms. • Replacement of 33 kV cable from TPC Parel RS to Marathon Futurex along with additional cables. (5.722 Kms.) • Replacement & diversion of 33 kV cable pert portion of Cumballa Hill RSS (T/F 1, 2 & 4) and laying additional one no. of 33 kV cable for Apollo Mill RSS (T/F 2) (Qty. 7.761 Kms.) • Diversion & replacement of EHV Cables of Sitaladevi RSS (T/F 1, 2, 3 & 4), VSNL RSS and VSNL HV consumer from T. H. Kataria Marg ROB below Western Railway Tracks (Qty. 2.210 Kms, Included HDD Cost)) • Diversion& replacement of EHV Cables of part portion of 33 kV feeders DBA1→ Futurex 33 kV HT Room LHS & DBA2→ Futurex 33kV HT Room RHS below Western Railway Tracks (Delisle ROB) (Qty. 3.420 Kms, Included HDD Cost))
3	Objective / Justification	i. To meet increasing load in existing areas of supply. ii. Build & maintain adequate redundancy in the system iii. 24x7 power supply for consumers in Mumbai City. iv. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking v. To maintain reliability and quality of Electric Supply to the Consumers.
4	Estimated Cost	Rs. 56.22 Crore
5	In-principle approval accorded	Rs. 56.07 Crore

—14—

<table>
<tr><td>7</td><td>Approved Phasing</td><td>
<table>
<tr><th>Sr. No.</th><th>Particulars</th><th>Total</th><th>FY 2019-20</th><th>FY 2020-21</th><th>FY 2021-22</th><th>FY 2022-23</th></tr>
<tr><td>1</td><td>Capital Expenditure in Rs Cr</td><td>56.07</td><td>8.84</td><td>11.84</td><td>15.77</td><td>19.62</td></tr>
<tr><td>2</td><td>Capitalisation in Rs Cr</td><td>56.07</td><td>8.84</td><td>11.84</td><td>6.02</td><td>29.37</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	**To meet increasing load in existing areas of supply. Build & maintain adequate redundancy in the system 24x7 power supply for consumers in Mumbai City. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking To maintain reliability and quality of Electric Supply to the Consumers..**
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 0.28 Crores in the 1st year, going up to Rs.1.64 Crores in the 4th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

Appendix – "A"

Cost Abstract

Sr. No.	Name of Scheme	Approved Cost in Rs Cr
1.	Replacement of 10/12.5 MVA Power Transformers at Sitaladevi RSS Tr. No. 4, Byculla RSS Tr. No. 1 & 3 (Qty-3 Nos.)	**5.09**
2.	Replacement of 33 kV switchgears at Mahim Causeway RSS(Qty-3 Nos.)	**0.59**
3.	Diversion of 33 kV feeder cables of RSS viz.Wadala RSS (T/F. No. 1 & 3), Kingsway RSS (T/F. No. 2), Raoli Hill RSS (T/F. No.2), Sion Fort RSS (T/F. No. 2), Pratiksha Nagar (T/F. No. 1), Lodha Crown T6 (T/F. No. 1) from TPC Dharavi RS to TPC Antop Hill RS and laying of additional cables for proposed Pratiksha Nagar RSS (T/F2), Lodha Crown T6 (T/F2), Lodha Crown T10 (T/F1&2) and New RSS commissioning at Dosti Acres (Qty. 16.961 Kms.	**22.55**
4.	Replacement of 33 kV cable from TPC Parel RS to Marathon Futurex along with additional cables. (5.722 Kms.)	**8.51**
5.	Replacement & diversion of 33 kV cable pert portion of Cumballa Hill RSS (T/F 1, 2 & 4) and laying additional one no. of 33 kV cable for Apollo Mill RSS (T/F 2) (Qty. 7.761 Kms.)	**10.92**
6	Diversion & replacement of EHV Cables of Sitaladevi RSS (T/F 1, 2, 3 & 4), VSNL RSS and VSNL HV consumer from T. H. Kataria Marg ROB below Western Railway Tracks (Qty. 2.210 Kms, Included HDD Cost)):	**3.47**
7	Diversion& replacement of EHV Cables of part portion of 33 kV feeders DBA1→ Futurex 33 kV HT Room LHS & DBA2→ Futurex 33kV HT Room RHS below Western Railway Tracks (Delisle ROB) (Qty. 3.420 Kms, Included HDD Cost))	**4.94**
	Grant total	**56.07**

महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

सत्यमेव जयते

MERC/CAPEX/2021-22/ 552

Date: 15 December, 2021

To,
The General Manager.
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject:In-principle clearance for the DPR of BEST for "Commissioning of New Distribution Substations (DSS) and Revamping of existing Distribution Substationsfor FY 2020-21 to FY 2024-25"(Rs. 150 Cr).

Sir,

This has reference to your submitted DPR for "Commissioning of New Distribution Substations (DSS) and Revamping of existing Distribution Substationsfor FY 2020-21 to FY 2024-25", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

2. No escalation in the unit cost has been considered.

3. The IDC shall be considered after execution of the project at time of MYT/MTR tariff Petition.

4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BESTshould communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

11. It directed to keep in detail all records of its distribution assets in detail and shall ensure that the future DPRs shall be associated with detail asset information.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
।। आदित्य हृदयम् ।।

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure "A"

Feasibility Report for Capital Investment Scheme for BEST

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Title (Name of Scheme)</td><td>Commissioning of New Distribution Substations (DSS) and Revamping of existing Distribution Substations for FY 2020-21 to FY 2024-25</td></tr>
<tr><td>2</td><td>Brief Scope of work</td><td>• Commissioning of New DSS (40 nos./year)
• Installation of Additional Distribution transformers (DTs) and replacement of transformers with higher capacity and age old DTs at existing DSS (30Nos/year)
• Replacement of OCBs by VCBs at existing DSS (25 nos./year).
• Remodeling of dilapidated DSS (Relocation-10 nos./year)</td></tr>
<tr><td>3</td><td>Objective / Justification</td><td>i. To meet increasing load in existing areas of supply.
ii. Build & maintain adequate redundancy in the system
iii. 24x7 power supply for consumers in Mumbai City.
iv. Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking
v. To maintain reliability and quality of Electric Supply to the Consumers.</td></tr>
<tr><td>4</td><td>Estimated Cost</td><td>Rs. 152.3 Crore</td></tr>
<tr><td>5</td><td>In-principle approval accorded</td><td>Rs. 150 Crore</td></tr>
<tr><td>6</td><td>1.1.1
Cost benefit analysis</td><td>Benefits of Rs 2.60 Crores in the 1st year, going up to Rs.23.09 Crores in the 5th year</td></tr>
<tr><td>7</td><td>Approved Phasing</td><td>
<table>
<tr><th>S. N.</th><th>Particulars</th><th>FY 20-21</th><th>FY 21-22</th><th>FY 22-23</th><th>FY 23-24</th><th>FY 24-25</th></tr>
<tr><td>1</td><td>Capital Expenditure</td><td>30.2</td><td>29.95</td><td>29.95</td><td>29.95</td><td>29.95</td></tr>
<tr><td>2</td><td>Capitalisation</td><td>30.2</td><td>29.95</td><td>29.95</td><td>29.95</td><td>29.95</td></tr>
<tr><td>3</td><td>IDC</td><td colspan="5">NIL (shall be considered after execution of the project at time of MYT/MTR tariff Petition)</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	**To meet increasing load in existing areas of supply.** **Build & maintain adequate redundancy in the system** **24x7 power supply for consumers in Mumbai City.** **Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking** **To maintain reliability and quality of Electric Supply to the Consumers..**
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 2.26 Crores in the 1st year, going up to Rs.23.09 Crores in the 5th year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified. BEST's expenditure phasing in the DPR proposal was starting from FY 20-21 to FY 24-25. As the year FY 2020-21 has been lapsed, the expenditure is shifted one year ahead i.e. starting from FY 21-22 to FY 25-26.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Appendix – "A"

Cost Abstract

Sr. No.	Item Description	FY2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
A	Commissioning of DSS (40 nos/year)	17.49	17.49	17.49	17.49	17.49
B	Augmentation/Replacement of Transformers (30 nos./year)*	5.24	4.99	4.99	4.99	4.99
C	Remodeling of DSS (10 nos./year)	4.78	4.78	4.78	4.78	4.78
D	Replacement of OCBs by VCBs (25 nos. of DSS/year)	2.69	2.69	2.69	2.69	2.69
	Total = Rs. 150 Crs	**30.20**	**29.95**	**29.95**	**29.95**	**29.95**

**For FY 20-21, Augmentation/Replacement of Transformers Qty is 32 Nos*

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

॥आदित्य हृदयम्॥

MERC/CAPEX/2020-21/

Date: 22 June, 2020

To,
The General Manager,
B.E.S.T. Undertaking,
BEST Bhavan, BEST Marg,
Colaba, Mumbai-400001.

Subject: In-principle clearance for the DPR of BEST for "Laying of HV and LV Cable and associated equipments for FY 2020-21 to FY 2024-25"(Rs 246.20 Cr)

Sir,

This has reference to your submitted DPR for "Laying of HV and LV Cable and associated equipments", for in-principle approval to the Commission. The said scheme has been evaluated with reference to the guidelines circulated by the Commission on 9 February, 2005.

1. I am directed to convey the 'in-principle' clearance of the scheme. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.
2. No escalation in the unit cost has been considered.
3. The IDC shall be considered after execution of the project at time of tariff Petition.
4. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved, etc., ex-post after implementation of the Scheme. BESTwill be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.
5. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

6. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

7. Income from the Scrapped material shall be considered as other income shall be shown separately at the time of MYT/MTR Tariff Petitions.

8. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

9. BEST shall endeavour to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

10. Major scope of work shall be executed through competitive bidding process only.

Yours faithfully,

Sd/-
(Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Feasibility Report for Capital Investment Scheme for BEST

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Title (Name of Scheme)</td><td>Laying of HV and LV Cable and associated equipments for FY 2020-21 to FY 2024-25</td></tr>
<tr><td>2</td><td>Brief Scope of work</td><td>• Laying of HV cable (25 KM per year)
• Laying of LV cables (56 KM per year)
• Installation of Auxillary Distribution Feeders (135 Nos per Year)
• Laying of service cables and installation of associated equipments.(40 KM per year)</td></tr>
<tr><td>3</td><td>Objective / Justification</td><td>• To increase the reach to consumers.
• To enhance the last mile connectivity
• To improve network flexibility.</td></tr>
<tr><td>4</td><td>Estimated Cost</td><td>Rs. 246.20 Crore</td></tr>
<tr><td>5</td><td>In-principle approval accorded</td><td>Rs. 246.20 Crore</td></tr>
<tr><td>6</td><td>Cost benefit analysis</td><td>Benefits of Rs 2.26Crores in the 1st year, going up to Rs.23.09Crores in the 5th year</td></tr>
<tr><td>7</td><td>Approved Phasing</td><td>
<table>
<tr><th>S. N.</th><th>Particulars</th><th>FY 2020-21</th><th>FY 2021-22</th><th>FY 2022-23</th><th>FY 2023-24</th><th>FY 2024-25</th></tr>
<tr><td>1</td><td>Capital Expenditure in Rs Cr</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td></tr>
<tr><td>2</td><td>Capitalisation in Rs Cr</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td><td>49.24</td></tr>
<tr><td>3</td><td>IDC</td><td colspan="5">NIL (shall be considered after execution of the project at time of tariff Petition)</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Proposed Funding Arrangement</td><td>Debt Equity Ratio is 70:30.</td></tr>
</table>

B. Observations / Comments on FR

1.	**Prudence of Investment / Technical Justification**	• To meet increasing load in existing areas of supply. • Build & maintain adequate redundancy in the system • 24x7 power supply for consumers in Mumbai City. • Reduction of AT&C losses/maintaining of existing low level of AT&C losses of the BEST Undertaking • To maintain reliability and quality of Electric Supply to the Consumers..
2.	**Reasonability of Cost Estimate**	It is observed that BEST is following the open-tender Competitive Bidding approach for procurement of materials and services. The contract is awarded to lowest quoted bidder. The competitive approach ensures the least cost approach for execution of capital expenditure schemes.
3.	**Comments on Cost Benefit Analysis**	Benefits of Rs 2.26 Crores in the 1^{st} year, going up to Rs.23.09 Crores in the 5^{th} year
4.	**Discrepancy / Shortcomings Observed**	Complied by BEST.
5.	**Remarks / Specific Comments, if any**	The scheme is technically justified.

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Appendix –A
Cost Abstract

Sr. No.	Item Description	CABLE TYPE	Rs. Crore PER KM	Per Year QTY in KM	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
A	**HV CABLE**		UNIT COST		**CAPITAL EXPENTITURE (In CRORE)**				
1	Laying of 11 KV HV Cables	AL, XLPE	0.2566	**25.000**	**6.41**	**6.41**	**6.41**	**6.41**	**6.41**
B	**LVCABLE**								
1	Laying of 1.1 KV 4CX300 SQ.MM CABLE	AL, XLPE	0.2061	36.000	7.42	7.42	7.42	7.42	7.42
2	Laying of 1.1 KV 4CX120 SQ.MM CABLE	AL, XLPE	0.1349	5.500	0.74	0.74	0.74	0.74	0.74
3	Laying of 1.1 KV 4CX70 SQ.MM CABLE	AL, XLPE	0.1232	1.000	0.12	0.12	0.12	0.12	0.12
4	Laying of 1.1 KV 4CX25 SQ.MM CABLE	AL, XLPE	0.1042	2.500	0.26	0.26	0.26	0.26	0.26
5	Laying of 1.1 KV 2CX25 SQ.MM CABLE	AL, XLPE	0.1003	0.500	0.05	0.05	0.05	0.05	0.05
6	Laying of 1.1 KV 2CX50 SQ.MM CABLE	AL, XLPE	0.1051	1.000	0.11	0.11	0.11	0.11	0.11
7	Laying of 1.1 KV 3CX95 SQ.MM CABLE	AL, XLPE	0.1195	0.500	0.06	0.06	0.06	0.06	0.06
8	Laying of 1.1 KV 1CX400 SQ.MM CABLE	CU. XLPE	0.2920	9.000	2.63	2.63	2.63	2.63	2.63
	TOTAL OF B			**56.000**	**11.39**	**11.39**	**11.39**	**11.39**	**11.39**
C	**R I Cost (HV+LV)**		0.7708	**24.27**	**18.71**	**18.71**	**18.71**	**18.71**	**18.71**
D	**Auxiliary Distribution Pillars (ADP)**								
1	6 WAY ADP	-	0.0087	95	0.83	0.83	0.83	0.83	0.83
2	10 WAY ADP	-	0.0110	30	0.33	0.33	0.33	0.33	0.33
3	12 WAY ADP	-	0.0125	10	0.12	0.12	0.12	0.12	0.12
	TOTAL OF D			**135**	**1.28**	**1.28**	**1.28**	**1.28**	**1.28**
E	**SERVICE CABLE (QTY IN KM)**								
1	Laying of 1.1 KV 4CX300 SQ.MM CABLE	AL, XLPE	0.2061	26.000	5.36	5.36	5.36	5.36	5.36
2	Laying of 1.1 KV 4CX120 SQ.MM CABLE	AL, XLPE	0.1349	4.000	0.54	0.54	0.54	0.54	0.54
3	Laying of 1.1 KV 4CX70 SQ.MM CABLE	AL, XLPE	0.1232	2.000	0.25	0.25	0.25	0.25	0.25
4	Laying of 1.1 KV 4CX25 SQ.MM CABLE	AL, XLPE	0.1042	2.800	0.29	0.29	0.29	0.29	0.29
5	Laying of 1.1 KV 2CX25 SQ.MM CABLE	AL, XLPE	0.1003	5.200	0.52	0.52	0.52	0.52	0.52
	TOTAL OF E			**40.000**	**6.96**	**6.96**	**6.96**	**6.96**	**6.96**
F	**R I Cost (SERVICE CABLE) (kms)**	-	0.7708	**5.830**	**4.49**	**4.49**	**4.49**	**4.49**	**4.49**
	GRAND TOTAL (A+B+C+D+E+F) in Cr	**246.2**			**49.24**	**49.24**	**49.24**	**49.24**	**49.24**

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महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

MERC/CAPEX/2023-24/0023 **Date: 09 January, 2024**

To,
The General Manager,
BEST Undertaking,
2nd Floor, Backbay Veej Bhavan,
149/150, Gen J. Bhosale Marg,
Nariman Point, Mumbai 400 021.

Subject :-BEST DPR for Implementation of of various schemes under RDSS (Rs 1711.21 Crore)

Sir,

1. This has reference to your submitted DPR, for in principle approval to the Commission. The said scheme has been evaluated with reference to the Capex Regulations, 2022

2. I am directed to convey the 'in-principle' clearance of the scheme for the cost of Rs.1720.14 Crs under MERC (Approval of capital Invest Scheme) Regulations 2022. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

3. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

4. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

5. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

6. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

7. BEST shall endeavor to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within a period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

8. BEST to ensure that the income realization from scrap material shall be treated as per accounting principles.

9. BEST to submit the utilization report of credited equipment, if any, along with the six monthly report till all equipment's are reused.

10. Major scope of work shall be executed through competitive bidding process only.

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure A

Name of the scheme	**BEST DPR for Implementation of of various schemes under RDSS**
Estimated cost proposed by BEST (Revised)	Rs. **1711.21**Crore
In-principle approval accorded	Rs. **1711.21** Crore
Cost benefit	a) Loss reduction b) Addnl. Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services
Scope of the works in brief	

Particulars	Additional	Replacement	Total
Power Transformers 33/11 KV in Nos	2	18	20
33 kV, 1500 MVA Primary Switchgears in Nos	1	17	18
11 kV,350 MVA Secondary Switchgears in Nos	1	31	32
33 KV Cable in KM	20	100	120
DSS 666 Nos		666	666
Replacement of SF6 RMUs		104	104
Replacement of Oil Filled RMUs by SF6 RMUs		95	95
Replacement of Oil Type switchgears by VCB		1726	1726
11 KV Cable in KM		200	200
LV Cable in KM		50	50
Meter Boards		74666	74666
ADMS for 870 DSS	1		1
ERP IT/ OT	1		1

Objectives/Justification	a) Loss reduction b) Additional Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services
Funding arrangement	Funding arrangement for execution of these schemes is 70:30 Debts Equity, as per MYT Regulations and Grant from Central Governmen under RDSS.
Time frame/phasing out of expenditure	**(Amount in Rs. Crs)**

DPR Years	Total	FY 22-23	FY 23-24	FY 24-25
Capex	1711.21	429.73	736.94	544.54
Capitalization	1711.21	429.73	736.94	544.54
IDC		Nill		

Observations / Comments on Feasibility Report

1.	Prudence of Investment / Technical Justification	1. For loss reduction 2. For improvement in reliability
2.	Reasonability of Cost Estimate	BEST has carried out open tender process for allotment of the work contract and followed least cost option process
3.	Comments on Cost Benefit Analysis	a) Loss reduction b) Additional Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services
4.	Discrepancy/Shortcomings Observed	Compiled by BEST
5.	Remarks/Specific Comments if any	Based on technical scrutiny and scope suggested by BEST, the scheme seems to be technically and commercially prudent.

Appendix A

RSS:-

Sr. No.	Name of Scheme	Cost in Cr.	FY 2023-24 QTY (in No.)	FY 2023-24 Cost (in Cr.)	FY 2024-25 QTY (in No.)	FY 2024-25 Cost (in Cr.)	FY 2025-26 QTY (in No.)	FY 2025-26 Cost (in Cr.)	Total QTY	Total Cost (in
A	Installation of Additional 33/11 kV, 16 MVA T/F (1 No.) at Pratiksha Nara RSS and 33/11-6.6 kV, 16 MVA T/F at Naval Dock RSS (1 No.) (Qty-2)	7.16	1	2.84	1	4.32			2	
B	**Replacement of Transformers:**								0	
B	Replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS viz. Mahalaxmi (2 Nos.), Sitaladevi (1 No.), Mazgaon Dock (2 Nos.), Sewree (2 Nos.), Kussara (1 No.), KEM Hosp (1 No.), Naval Dock (2 Nos.) Apollo (3 Nos.), Hutatma Chowk (3 No.) & Mahim (1 No.) (Qty-18 Nos.)	49.83	0		9	24.92	9	24.92	18	
C	Replacement of 33 kV, 1500 MVA Primary Switchgears viz. Mazgaon Dock (1 No.), Mumbadevi (2 Nos.), Mahim (2 Nos.), Masjid (1 No.), KEM Hospital (1 No.), Nair Hospital (1 No.), Kingsway (2 Nos.) Apollo (1 No.), Prabhadevi (2 Nos.), Nestle (1 No.), Ballard Estate (3 Nos.)& Colaba (1 No.) (Qty-18 Nos.)	4.65	5	1.29	7	1.81	6	1.55	18	
D	Replacement of 11 kV, 350 MVA Secondary Switchgears viz. Mahim causeway (2 Nos.), Grant Road (4 Nos.), Mahalaxmi (1 No.), Prabhadevi (2 Nos.), Kussara (2 Nos.), Apollo (2 Nos.), Dharavi (2 Nos.), Sewree (2 Nos.), Esplanade (3 Nos.), Mahim (2 Nos.), Wadala (2 Nos.), Malbar Hill (2 Nos.), KEM Hospital (1 No.), Worli (2 Nos.), Nair Hospital (1 No.) & Mahalaxmi (2 Nos.) (Qty-32 Nos.)	38.15	7	8.35	13	15.50	12	14.31	32	
E	Replacement / Laying of old /outlived 22/33 kV, 3CX300 SQ. MM Cu XLPE Cable (120 KM)	405.12	32.5	109.72	50	168.80	37.5	126.60		
F	PMA Charges	3.05		0.68		1.32		1.05		
	GRAND TOTAL	507.96		122.87		216.66		168.42		5
	MVA Added	MVA	16		70		18			
				122.87		216.66		168.42		50

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DSS:-

Sr. No.	Name of Scheme	Cost in Cr.	FY 2023-24 QTY (in No.)	FY 2023-24 Cost (in Cr.)	FY 2024-25 QTY (in No.)	FY 2024-25 Cost (in Cr.)	FY 2025-26 QTY (in No.)	FY 2025-26 Cost (in Cr.)	Total QTY	Total Cost (in Cr.)
A	Replacement of DTs (Qty-666 Nos.)	210.16	200	63.11	233	73.52	233	73.52	666	210.16
B	Replacement of SF_6 RMUs (which are not caompatible for Distribution Automation) (Qty-104 Nos.)	11.25	30	3.25	34	3.68	40	4.33	104	11.25
C	Replacement of Oil Filled RMUs by SF_6 RMUs caompatible for Distribution Automation) (Qty-95 Nos.)	9.43	29	2.88	36	3.57	30	2.98	95	9.43
D.	Replacement of Oil Type switchgears by VCB switchgears compaible for Distribution Automation) (Qty-396 Nos.)	101.14	76	19.41	160	40.86	160	40.86	396	101.14
E.	Replacement /Additional of 11 kV HV weak/old cable with 3CX240 SQ Mm XLPE cable (200 KM)	268.35	40	53.67	80	107.34	80	107.34	200	268.35
F	Replacement /Additional of 1.1 kV LV weak/old cable with 4CX300 SQ Mm XLPE cable (50 KM)	90.61	10	18.12	20	36.25	20	36.25	50	90.61
G	PMA Charges	5.88		1.36		2.26		2.26		5.88
	GRAND TOTAL	696.81		161.80		267.48		267.54		696.81

Auxiliary Components: -

DETAILS OF BREAK-UP OF TOTAL CONTRACTUAL VALUE OF INDIVIDUAL OFFER										
COST SHEET OF AUXILIARY COMPONENT ;S OF THE CONSUMER METERS										
Sr. No.	Description	Unit	Qty	Basic Rate Material	Basic Rate Labour	Gross Rate with GST	Item wise Total Cost in Rs.Cr	FY 2023-24	FY 2024-25	FY 2025-26
A	B	C	D	E	F	G =1.18*(E+F)	H =D*G			
1.01	Refurbishment of Meter Boards (1050 x 1050 X 19 mm i.e. 42"x 42") with facility to install 15 Nos. of Single Phase Meter, Wire and 63 Amps MCB.	Nos.	19190	8093.33	4034.36	14310.66	27.46			
2	Refurbishment of Meter Boards (1050 x 700 X 19 mm i.e. 42"x 28") with facility to install 4 Nos. of Three Phase Meter, Wire and 100 Amps MCB.	Nos.	26168	8749.32	3128.03	14015.28	36.68			
3	Refurbishment of 10 Way wooden Circuit Boxes for Flutment supply with facility to install 10 Nos. of Single Phase Meter, Wire and 40 Amps MCB.	Nos.	3140	15676.67	2386.80	21314.89	6.69			
4	Refurbishment of water Tight Aluminium Meter Box with Cover Type along with supply of and remaking of the cable gland.	Nos.	26168	2836.33	795.60	4285.68	11.22			
						Contractual Value	82.05	24.61	28.72	28.72
	PMA Charges						3.42	1.02	1.2	1.2
	Grand Total in Rs Cr						85.47	25.63	29.92	29.92

ADMS

SR. NO.	PARTICULARS	Gross Total with GST (in Rs Cr.)	FY 2023-24	FY 2024-25	FY 2025-26
1	SCADA/DMS Cnotrol Center : C1 - Servers / Workstation Hardware , Storage & Backup Devices, Switches, Data Centre Router, Security system (DMZ), Software for Control Centre (For Main & Standby Server) & Mandatory Spares	11.573			
2	SCADA/DI IS DR Control Centre D1 - Server/ workstation Hardware, Storage & Backup Devices, Switches, Routers,	10.724			
3	RTUs, Software for LDMS, Test Equipments for RTU & Mandatory Additional Spares	11.303			
4	FRTUs, Test Equipments for FRTU & Mandatory Additional Spares	11.024			
5	MPLS, GPRS & Mandatory Additional Spares	10.478			
6	Main Equipments - Control centre, Main Equipments - DR Centre, For RTU/Data Concentrator/Communication Eqpts, FRTU, Remote VDU location & Mandatory Additional Spares.	4.289			
7	FPI, Control/power/Communication cable for RSS and DSS and mandatory Additional Spares	25.948			
8	IED Replacement & Mandatory Additional Spares	20.747			
9	Comprehensive Facility Management System	45.704			
10	Project Management Cost (Inclusive of GST)	30.358			
	Total	**182.15**	**87.37**	**53.65**	**41.13**
	PMA Charges	**1.89**	**0.9**	**0.56**	**0.43**
	Total In Rs Cr	**184.04**	**88.27**	**54.21**	**41.56**

ERP IT/OT

ERP, BILLING SOFTWARE AND IT/OT ENABLEMENT

Cost in Rs.Cr

SR. NO.	PARTICULARS	UNIT	QTY	TOTAL COST	FY 2023-24		FY 2024-25		FY 2025-26	
					QTY	Cost	QTY	Cost	QTY	Cost
1	Part IT System Implementation Phase Cost	No.	1	162.05	-	31.02600213	-	131.02	-	
2	IT System - ATS Cost (For 2 Years)	No.	1	26.46	-		-	13.23	-	13.23
3	Cloud Service Provider (CSP) Cost (For 2 Years)	No.	1	8.15	-		-	4.07	-	4.07
4	FMS services Cost (for 2 years)	No.	1	28.12	-		-	14.06	-	14.06
5	Operations & Maintenance (O&M) Services Cost (For 2 Years)	No.	1	11.16	-		-	5.58	-	5.58
	TOTAL			235.93		31.03		167.97		36.94
7	PMA Charges			1.00		0.13		0.71		0.16
	GRAND TOTAL in Rs Cr		-	236.93		31.16		168.68		37.10

Consolidated DPR

Sr No	Particulars	Total Capex in Rs Cr	FY 2023-24	FY 2024-25	FY 2025-26
1	RSS	504.91	122.19	215.34	167.37
2	DSS	690.93	160.44	265.22	265.28
3	Auxiliary Components	82.05	24.61	28.72	28.72
4	ADMS	182.15	87.37	53.65	41.13
5	ERP	235.93	31.03	167.96	36.94
6	PMA	15.24	4.09	6.05	5.1
	Total in Rs Cr	**1711.21**	**429.73**	**736.94**	**544.54**

4th. QTR Capex & Capitalisation for F.Y. 2023-24

Sr.No.	Project Code	MERC Approval No.	MERC Approval Date	MERC Approved Cost	Cumulative Expenditure Incurred till beginning of the Year	Capital Expenditure Capitalised	Opening CWIP FY 23-24	Investment during the year up to Mar.24	Capital Work in Progress				Closing CWIP
									Works Capitalised upto Mar-24	Interest Capitalised	Expenses Capitalised	Total Capitalisation	
	FY 2023-24												
	a) DPR Schemes												
	(i) In-principle approved by MERC												
	New RSS												
1	BEST/ FY16/01	MERC/CAPEX/FY2016-17 00770 dtd.	28.09.2016	82.23	22.98	16.80	6.18	0.85	0.83			0.83	0.02
2	BEST/ FY21/01	MERC/CAPEX/FY2020-21/	16.07.2020	27.40	0.09	0.09	0.00	-0.09	-0.09			-0.09	0.00
	Augmentation/Replacement at Existing RSS												
3	BEST/ FY16/02	MERC/TECH_V/CAP/DPR/20122013/02688	22.02.2013	36.63	**14.20**	**14.20**	0.00	0.00	0.00			0.00	0.00
4	BEST/ FY17/02	MERC/CAPEX/2017-18/4706	16.11.2017	64.09	**34.16**	**34.16**	0.00	5.37	5.37			5.37	0.00
5	BEST/ FY18/02	MERC/CAPEX/2017-18/4706	16.11.2017	58.86	**7.29**	**7.29**	0.00	1.96	1.96			1.96	0.00
6	BEST/FY 18/02A	MERC/CAPEX/2019-20/135	10.05.2019	15.58	**15.48**	**15.48**	0.00	0.00	0.00			0.00	0.00
7	BEST/ FY20/02	MERC/CAPEX/2020-21/553	15.12.2021	40.60	**27.80**	**27.80**	0.00	2.38	2.38			2.38	0.00
	IPDS/BEST/ FY15-16/01	MERC/CAPEX/2019-20/418 (L & T PART)	26.07.2019	92.40	**88.21**	**88.21**	0.00	0.00	0.00			0.00	0.00
	IPDS/BEST/ FY15-16/01	BEST PART	26.07.2019	25.69	**14.14**	**14.14**	0.00	0.00	0.00			0.00	0.00
9	BEST/ FY21/02	MERC/CAPEX/2022-23/0556	14.11.2022	56.07	**27.35**	**27.35**	0.00	0.01	0.01			0.01	0.00
	New DSS & Aug. & Alt. to exist. DSS												
	Extension of Distribution Network												
10	BEST/ FY21/03	MERC/CAPEX/2020-21/552	15.12.2021	150.00	**74.88**	**74.88**	0.00	38.18	38.18			38.18	0.00
11	BEST/ FY21/04	MERC/CAPEX/2020-21	22.06.20	246.20	**158.53**	**158.53**	0.00	48.05	48.05			48.05	0.00
	SCADA,BPA & Distribution Automation												
12	BEST/ FY18/08A	MERC/CAPEX/2017-18/4759	22.11.17	13.12	0.00	0.00	0.00	0.00	0.00			0.00	0.00
13	BEST/ FY18/08B	MERC/CAPEX/2017-18/4886	13.12.2017	9.22	0.45	0.45	0.00	0.00	0.00			0.00	0.00
	Energy Meter												
14	BEST/FY19/06	MERC/CAPEX/2019-20/1110	28.11.2019	30.19	**29.26**	**29.26**	0.00	0.00	0.00			0.00	0.00
15	IPDS/BEST/ FY2015-16/01	MERC/CAPEX/2019-20/116	18.04.2019	12.94	12.90	12.90	0.00	0.00	0.00			0.00	0.00
16	BEST/ FY23/06	-	DPR NOT Approved	0	**0.00**	**0.00**	0.00	0.00	0.00			0.00	0.00
17	RDSS/BEST/ FY2023-24/01 (R)	MERC/CAPEX/2023-24/0023 DTD. 09.01.2024	RSS Part	504.91	0.00	0.00	0.00	12.99	12.99			12.99	0.00
			DSS Part	690.93	0.00	0.00	0.00	0.00	0.00			0.00	0.00
			ADMS	182.15	0.00	0.00	0.00	0.00	0.00			0.00	0.00
			Aux. Equipments	82.05	0.00	0.00	0.00	0.01	0.01			0.01	0.00
			ERP	235.93	0.00	0.00	0.00	0.00	0.00			0.00	0.00
			PMA	15.24	0.00	0.00	0.00	0.00	0.00			0.00	0.00
	b) Non-DPR Schemes												
17	Revamping of RSS & other schemes (Non-DPR)	-	-		**14.07**	**12.11**	1.96	2.59	2.10			2.10	0.49
18	BPA		-		**0.03**	**0.03**	0.00	0.00	0.00			0.00	0.00
19	Street Lighting (lamps & Cables)	-	-		**6.69**	**6.69**	0.00	3.51	3.51			3.51	0.00
20	Furniture, Office Eq., Tools, Civil Engg. Works, Motor Vehicle etc.	-	-		**2.01**	**2.01**	0.00	0.26	0.26			0.26	0.00
21	GFA				**18.90**	**18.90**	0.00	13.16	13.16			13.16	0.00
	Total			**2672.43**	**569.42**	**561.28**	**8.14**	**129.23**	**128.72**	**0.00**	**0.00**	**128.72**	**0.51**
								137.37				**137.37**	

Annexure-B

F.Y.	2020-21	2021-22	2022-23	2023-24	2024-25
sale in Mus	4643.66	4683.78	4537.98	4772.81	5023.20
RoE projected	129.45	130.37	139.11	143.82	148.72
RoE/ unit	0.279	0.278	0.307	0.301	0.296

Particulars	Unit	Value	Value	Value	Value	Value
Total capacity added by additional Tr.	MVA	**16.00**	0.00	0.00	0.00	**32.00**
Average Power Factor		0.9900	0.9900	0.9900	0.9900	0.9900
Current RSS Load factor		62.05%	62.56%	60.04%	59.64%	58.01%
RoE/ unit	Rs.	0.279	0.278	0.307	0.301	0.296

Calculation of loading rates

loading trend	1st year	2nd year	3rd year	4th year	5th year
loading percentages	20.00%	30.00%	40.00%	50.00%	58.01%

Revenue due to additional sales

Particulars	F.Y. 2020-21	F.Y. 2021-22	F.Y. 2022-23	F.Y. 2023-24	F.Y. 2024-25
Cumulative capacity commissioned (MVA)	**16.00**	**16.00**	**16.00**	**16.00**	**48.00**
Incremental loading	20.00%	30.00%	40.00%	50.00%	58.01%
Distribution losses	3.82%	4.63%	4.18%	4.12%	4.18%
System power factor	0.9900	0.9900	0.9900	0.9900	0.9900
Additional sales (MU)	26.69	39.70	53.18	66.52	130.31
RoE per Unit (Rs/ unit)	0.279	0.278	0.307	0.301	0.296
Total adduitional revenue (Rs. Crore)	0.74	1.11	1.63	2.00	3.86

Capitalisation schedule

Particulars	TOTAL	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25
Capital Expenditure for the scheme (Rs. Cro	27.40	5.97	7.46	5.71	5.26	3.00
Amount proposed to be capitalized	27.40	5.97	7.46	5.71	5.26	3.00

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
World Trade Centre, Centre No.1, 13th Floor, Cuffe Parade, Mumbai – 400 005
Tel. No. 022- 22163964/ 65/ 69 Fax No. 022 - 22163976
Email: mercindia@merc.gov.in
Website: www.merc.gov.in

CASE No. 212 of 2022

In the matter of

Petition of Brihanmumbai Electric Supply and Transport Undertaking (BEST) for Truing-up of Aggregate Revenue Requirement (ARR) for FY 2019-20, FY 2020-21 and FY 2021-22, Provisional Truing-up of ARR FY 2022-23 and revised ARR & Tariff for FY 2023-24 and FY 2024-25

Coram
Sanjay Kumar, Chairperson
I. M. Bohari, Member
Mukesh Khullar, Member

Date: 31 March, 2023

ORDER

In accordance with Regulation 5 of the Maharashtra Electricity Regulatory Commission (Multi-Year Tariff) Regulations, 2019 ('**MYT Regulations, 2019**'), Brihanmumbai Electric Supply and Transport Undertaking (BEST) has filed its Mid Term Review Petition for Truing-up of Aggregate Revenue Requirement (ARR) for FY 2019-20, 2020-21 and FY 2021-22, Provisional Truing-up of ARR for FY 2022-23 and revised ARR & Tariff for FY 2023-24 and FY 2024-25. The original Petition was filed on 30 November, 2019 and the revised Petition after incorporating the replies to the data gaps was filed on 17 January, 2023.

The Petition has been filed in accordance with MERC (Multi Year Tariff) Regulations, 2015 ("**MYT Regulations, 2015**"), for Truing-up of ARR for FY 2019-20 and in accordance with MYT Regulations, 2019, for Truing-up of ARR of FY 2020-21 and FY 2021-22, Provisional Truing-up of ARR for FY 2022-23 and revised ARR and Tariff for FY 2023-24 and FY 2024-25.

The Commission, in exercise of the powers vested in it under Sections 61 and 62 of the Electricity Act (**EA**), 2003 and all other powers enabling it in this behalf, and after taking into consideration the submissions made by BEST and suggestions/objections received during the public consultation process, and all other relevant material, has approved the Truing-up of ARR for FY 2019-20, FY 2020-21 and FY 2021-22, Provisional Truing-up of ARR for FY 2022-23 and revised ARR and Tariff for FY 2023-24 and FY 2024-25 in this Order.

TABLE OF CONTENTS

Consumer Category & Consumption Slab	FY 2023-24			FY 2024-25		
	MYT Order	**MTR Petition**	**Approved in this Order**	**MYT Order**	**MTR Petition**	**Approved in this Order**
LT - II (b) Commercial - >20 & <=50 kW	210.69	172.24	179.30	210.39	173.74	188.26
LT - II (c) Commercial - >50	369.24	358.23	365.40	368.70	358.23	372.71
LT - III (A) Industry (upto 20 kW)	43.14	105.74	112.08	43.08	105.74	118.81
LT-III (b) Industrial	90.12	79.81	83.80	89.99	79.81	87.99
LT - IV (A) Public Services - (Govt. Hosp. & Edu. Institutions)	57.03	61.40	61.40	57.45	61.40	61.40
LT - IV (B) Public Services - Others	183.68	178.82	187.76	183.43	178.82	197.15
LT-V (A) Agriculture-Pumpsets	-	-	-	-	-	-
LT-V (B) Agriculture- Others	-	0.05	0.05	-	0.05	0.05
LT VI Vehicle Charging	0.58	22.72	20.90	0.72	28.40	24.03
Sub-total	**4,052.71**	**3,944.89**	**4,086.73**	**4,084.90**	**3,988.10**	**4.283.37**
Total	**4,771.37**	**4,592.22**	**4,786.55**	**4,816.71**	**4,635.43**	**5,038.14**

*-HT Sales in kVAH and LT in kWH

6.2.12 The Commission approves Energy Sales of 4,786.55 MU for FY 2023-24 and 5,038.14 MU for FY 2024-25 respectively.

6.3 Distribution Losses and Energy Balance

BEST's Submission

6.3.1 BEST submitted that it has been taking various initiatives such as continuous vigilance activities, raids, consumer awareness on theft and energy conservation, legal actions against theft incidences and faulty meter replacements. Through these initiatives BEST has been able to consistently maintain its distribution losses in the range of 4 % to 5% which are almost near to the technical minimum of the network. The present distribution losses are one of the lowest in the country. It is appreciable that reducing losses at higher loss levels are far easier than reducing losses at efficient levels. BEST's distribution losses are at most efficient levels and BEST has proposed to reduce it.

6.3.2 BEST has achieved a distribution loss of 4.63% for the FY 2021-22. BEST has projected reduction in distribution loss for the remaining years of the control period by 0.1% each year vis-à-vis 4.63% achieved by BEST for FY 2021-22.

6.3.3 BEST submitted that the Intra-State Transmission (InSTS) loss of 3.18% has been considered while estimating the energy balance for FY 2023-24 & FY 2024-25 as approved by the Commission in MYT order.

6.3.4 Based on the target distribution loss proposed by BEST and Transmission loss of 3.18%, BEST has estimated the revised energy requirement for FY 2023-24 and FY 2024-25 is given in the table below:

Table 227 : Revised Energy Balance for the FY 2023-24 and FY 2024-25, as submitted by BEST

Particulars	Unit	FY 2023-24		FY 2024-25	
		MYT Order	Revised Projections	MYT Order	Revised Projections
Energy sales to consumers	MU's	4,771.37	4,579.60	4,816.71	4,622.81
Distribution Losses	MU's	208.14	212.28	210.12	209.23
Distribution Losses	%	4.18%	4.43%	4.18%	4.33%
Energy Input at Distribution Periphery	MU's	4,979.44	4,791.88	5,026.75	4,832.04
Intra State Transmission Losses	MU's	163.55	157.39	165.10	158.71
Intra State Transmission Losses	%	3.18%	3.18%	3.18%	3.18%
Total Power Purchase at G<>T Periphery	MU's	5,142.99	4,949.26	5,191.85	4,990.74

Commission's Analysis and Ruling

6.3.5 BEST has projected reduction in distribution loss for the remaining years of the control period by 0.1% each year vis-à-vis 4.63% achieved by BEST for FY 2021-22 and accordingly projected Distribution Loss of 4.43% and 4.33% for FY 2023-24 and FY 2024-25 respectively.

6.3.6 Though the Distribution Loss are slightly higher in FY 2021-22, BEST has achieved lower losses in FY 2020-21 then 4.18% approved by the Commission.

6.3.7 The Commission is of the view that there is scope for reduction of Distribution loss considering the replacement of electromechanical Meters and many such other measures. The Commission has approved capital expenditure schemes for replacement of such meters, development of substations, revamping of existing receiving substations, extension and improvement of distribution network, etc. the benefit of which would accrue to consumers. The Commission directs BEST to continue its efforts in bringing down the Distribution losses to the lowest possible levels and ensure that performance does not deteriorate beyond the levels already achieved in the past.

6.3.8 In MYT Order, the Commission has approved Distribution loss target of 4.18% for FY 2023-24 and FY 2024-25. The Commission while approving the Distribution Loss for FY 2022-23 in this Order has already held that to maintain consistency in its approach, the Commission has decided not to restate the loss trajectory as approved in the MYT Order.

6.3.9 In view of the above, the Commission for the purpose of the present approvals has retained the Distribution loss target at 4.18% for FY 2023-24 and FY 2024-25 as given in the Table below:

Table 228: Distribution Loss Trajectory for FY 2023-24 and FY 2024-25, as approved by the Commission (MU)

Particulars	FY 2023-24			FY 2024-25		
	MYT Order	**MTR Petition**	**Approved in this Order**	**MYT Order**	**MTR Petition**	**Approved in this Order**
Distribution loss (%)	4.18%	4.43%	4.18%	4.18%	4.33%	4.18%

6.3.10 For the computation of Energy Balance, the Commission has considered the InSTS Loss of 3.18%, as approved in the InSTS order in Case No. 284 of 2022 vide dated 31 March, 2023. Accordingly, it has computed the Energy Balance for FY 2023-24 and FY 2024-25 as shown in the Table below:

Table 229: Distribution Loss Trajectory for FY 2023-24 and FY 2024-25, as approved by the Commission (MU)

Particulars	FY 2023-24			FY 2024-25		
	MYT Order	**MTR Petition**	**Approved in this Order**	**MYT Order**	**MTR Petition**	**Approved in this Order**
Sales (MU)	4,771.37	4,579.60	4,772.81	4,816.71	4,622.81	5,023.20
Distribution loss (%)	4.18%	4.43%	4.18%	4.18%	4.33%	4.18%
Energy Requirement at T-D interface (MU)	4,979.52	4,791.88	4,981.02	5,026.83	4,832.04	5,242.33
Intra-state Transmission loss (%)	3.18%	3.18%	3.18%	3.18%	3.18%	3.18%
Energy Requirement at G-T interface (MU)	**5,143.07**	**4,949.26**	**5,144.61**	**5,191.94**	**4,990.74**	**5,414.52**

6.3.11 Accordingly, the Commission approves energy requirement at G<>T interface of 5,144.61 MU for FY 2023-24 and 5,414.52 MU for FY 2024-25, respectively.

6.4 Power Purchase Expenses

BEST's Submission

6.4.1 BEST has estimated energy requirement for FY 2023-24 and FY 2024-25.

Commission for FY 2023-24 and FY 2024-25 is shown in the Table below:

Table 270: Provision for Bad and Doubtful Debts for FY 2023-24 and FY 2024-25, as approved by the Commission (Rs. Crore)

Particulars	MYT Order	MTR Petition	Approved in this Order	Wire Business	Supply Business
FY 2023-24					
Provision for Doubtful debts	6.74	9.18	7.97	0.80	7.18
FY 2024-25					
Provision for Doubtful debts	6.74	7.58	7.97	0.80	7.18

6.14.4 The Commission approves the Provision for Bad and Doubtful Debts of Rs. 7.97 Crore for FY 2023-24 and FY 2024-25 respectively.

6.15 Return on Equity

BEST's Submission

6.15.1 BEST has calculated Return on equity as per Regulations 29 of MYT Regulations, 2019. For the purpose of arriving at the Regulatory Equity at the beginning of the year, BEST has considered the closing equity of previous year. As impact of replacement/retirement of assets, BEST has reduced the Equity to the extent of 30% of the GFA of the assets that have been projected to be retired during the year as per Regulation 27 of MYT Regulations, 2019. The details are as presented in the table below:

Table 271 : Revised Return on Equity for Wires Business for FY 2023-24 and FY 2024-25, as submitted by BEST (Rs. Crore)

Particulars	FY 2023-24		FY 2024-25	
	MYT Order	MTR Petition	MYT Order	MTR Petition
Regulatory Equity at the beginning of the year	836.77	895.35	841.80	1,051.38
Capitalisation during the year	-	579.23	-	525.94
Equity portion of capitalisation during the year	15.71	173.77	15.68	157.78
Reduction in Equity Capital on account of retirement / replacement of assets	10.67	17.73	10.67	17.73
Regulatory Equity at the end of the year	841.81	1,051.38	846.81	1,191.43
Return on Equity Computation				
Base Rate of Return on Equity	14.00%	14.00%	14.00%	14.00%
Pretax Return on Equity after considering effective Tax rate	-	-	-	-
Return on Regulatory Equity at the beginning of the year	117.15	125.35	117.85	147.19
Return on Regulatory Equity addition during the year	0.35	10.92	0.35	9.80
Total Return on Equity	**117.50**	**136.27**	**118.20**	**157.00**

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Table 272 : Revised Return on Equity for Supply Business for FY 2023-24 and FY 2024-25, as submitted by BEST (Rs. Crore)

Particulars	FY 2023-24		FY 2024-25	
	MYT Order	MTR Petition	MYT Order	MTR Petition
Regulatory Equity at the beginning of the year	92.97	99.48	93.53	116.82
Capitalisation during the year	-	64.36	-	58.44
Equity portion of capitalisation during the year	1.75	19.31	1.74	17.53
Reduction in Equity Capital on account of retirement / replacement of assets	1.19	1.97	1.19	1.97
Regulatory Equity at the end of the year	93.53	116.82	94.09	132.38
Return on Equity Computation				
Base Rate of Return on Equity	15.50%	15.50%	15.50%	15.50%
Pre-tax Return on Equity after considering effective Tax rate	-	-	-	-
Return on Regulatory Equity at the beginning of the year	14.41	15.42	14.50	18.11
Return on Regulatory Equity addition during the year	0.04	1.34	0.04	1.21
Total Return on Equity	**14.45**	**16.76**	**14.54**	**19.31**

6.15.2 BEST has requested the Commission to approve the projected Return on Equity as submitted by BEST. Any variation in above expenses will be claimed on actual basis at the time of Truing-up.

Commission's Analysis and Ruling

6.15.3 In absence of non-applicability of Income Tax as BEST being Local Authority, the Commission has computed RoE at 14% and 15.5% of the equity for Wires Business and Supply Businesses, respectively, in accordance with the MYT Regulations, 2019

6.15.4 The Commission has computed RoE in accordance with Regulation 29 of the MYT Regulations, 2019, based on opening equity, addition of equity as per approved capitalisation and weighted average rate of RoE based on allocation of assets to the wires and supply business.

6.15.5 To determine the equity eligible for return as per the Regulations, the Commission has considered the closing equity for FY 2022-23 approved in this Order on provisional Truing-up, as the opening equity for FY 2023-24. The addition in equity has been considered equal to the equity component of asset addition during the year. The impact of the replacement of assets is considered by reducing the equity to the extent of 30 % of the GFA of the assets that have been retired during the year.

6.15.6 The RoE approved by the Commission for FY 2023-24 and FY 2024-25 is shown in Table below:

Table 273: Return on Equity for FY 2023-24 and FY 2024-25, as approved by the Commission (Rs. Crore)

Particulars	FY 2023-24				FY 2024-25			
	MTR Petition	Approved in this Order	Wire Business	Supply Business	MTR Petition	Approved in this Order	Wire Business	Supply Business
Regulatory Equity at the beginning of the year	994.83	997.77	898.00	99.78	1,168.21	1,034.99	931.50	103.50
Equity portion of capitalisation during the year	193.08	43.13	38.82	4.31	175.31	37.95	34.16	3.80
Reduction in Equity Capital on account of retirement / replacement of assets	19.70	5.91	5.32	0.59	19.70	5.91	5.32	0.59
Regulatory Equity at the end of the year	**1,168.21**	**1,034.99**	**931.50**	**103.50**	**1,323.82**	**1,067.04**	**960.33**	**106.70**
Return on Regulatory Equity at the beginning of the year	140.77	141.18	125.72	15.47	165.30	146.45	130.41	16.04
Return on Regulatory Equity addition during the year	12.27	2.63	2.35	0.29	11.01	2.27	2.02	0.25
Total Return on Equity	**153.03**	**143.82**	**128.06**	**15.75**	**176.31**	**148.72**	**132.43**	**16.29**

6.15.7 The Commission approves the Return on Equity of Rs. 143.82 Crore for FY 2023-24 and Rs. 148.72 Crore for FY 2024-25, respectively.

6.16 Return as Interest on Internal Funds

BEST's Submission

6.16.1 BEST has submitted the Interest on internal funds as under:

Table 274 : Revised Return on Internal Funds for FY 2023-24 and FY 2024-25, as submitted by BEST (Rs. Crore)

Particulars	FY 2023-24		FY 2024-25	
	MYT Order	MTR Petition	MYT Order	MTR Petition
Return on Internal Fund	5.28	5.28	5.28	5.28

6.16.2 BEST requested the Commission to approve the Return as Interest on Internal funds as submitted by BEST.

Commission's Analysis and Ruling

6.16.3 The Appellate Tribunal of Electricity, in its Judgment dated 27 August, 2007 in Appeal No. 13 of 2007 had directed the Commission to take into

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Sr. No.	DESCRIPTION	Unit	2019-20	2020-21	2021-22	2022-23	2023-24
I.	**Energy Purchase Details**						
1	Units Purchased at T&D	in MUs	4790.60	3926.96	4266.59	4678.68	4944.06
2	Cost of Energy	Rs. in Crores	2445.19	2317.29	2803.51	3774.99	3166.41
3	F.A. Paid to Tatas	Rs. in Crores	99.75	100.75	100.75	101.75	102.75
3	Average Cost Per Unit Purchased at T&D	in Paise / Unit	510.41	590.10	657.09	806.85	640.45
II.	**Energy Sale Details**						
1	Units Sold	in MUs	4569.34	3776.84	4068.97	4483.32	4740.15
2	Income from Sale of Energy	Rs. in Crores	3466.68	2792.74	2995.19	3527.52	4188.89
3	Average Selling Rate Per Unit Sold	in Paise / Unit	758.68	739.44	736.11	786.81	883.70
III.	**Surplus**						
1	Revenue Surplus	Rs. in Crores	1021.49	475.46	191.68	-247.48	1022.48
2	Revenue Surplus Per unit Purchased	in Paise / Unit	213.23	121.07	44.93	-52.90	206.81
3	Electricity Duty Collected for Govt. of Maharashtra	Rs. in Crores	563.27	444.76	467.82		
IV.	**Average Distribution Loss**	%	4.62	3.82	4.63	4.18	4.12
V.	Stystem Load Factor	%	58.97	62.05	62.56	60.04	59.64
	Co-incident Maximum Demand	in MVA	936.81	729.80	786.38	898.54	955.96
	Receiving Sub-stations						
	No. of Receiving Sub-stations		64	64	64	65	65
	No. of Power Transformers		152	153	153	155	155
	Capacity of Power Transformers	in MVA	2255	2283	2289	2321	2327
	Distribution Sub-stations						
	No. of Distribution Sub-stations		2428	2451	2477	2507	2538
	No. of Distribution Transformers		3264	3298	3334	3430	3470
	Capacity of Distribution Transformers	in MVA	2645	2682	2717	2842	2892

F.Y.	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
sale in Mus	4569.34	3776.84	4068.97	4483.32	4772.81	5038.14
RoE projected	140.93	129.45	130.37	139.11	143.82	148.72
RoE/ unit	0.308	0.343	0.320	0.310	0.301	0.295

Calculation of loading rates

loading trend	1st year	2nd year	3rd year	4th year	5th year
loading percentages	20.00%	30.00%	40.00%	50.00%	58.01%

Revenue due to additional sales

Particulars	F.Y. 2019-20	F.Y. 2020-21	F.Y. 2021-22	F.Y. 2022-23	F.Y. 2023-24	F.Y. 2024-25
Cumulative capacity commissioned (MVA)	**0.00**	**16.00**	**32.00**	**32.00**	**32.00**	**32.00**
Incremental loading	0.00%	20.00%	30.00%	40.00%	50.00%	58.01%
Distribution losses	4.62%	3.82%	4.63%	4.18%	4.18%	4.18%
System power factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Additional sales (MU)	0.00	26.69	92.63	132.96	172.85	183.50
RoE per Unit (Rs/ unit)	0.308	0.343	0.320	0.310	0.301	0.295
Total adduitional revenue (Rs. Crore)	0.00	0.91	2.97	4.13	5.21	5.42

Capitalisation schedule

Particulars	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	Total
Capital Expenditure for the scheme (Rs. Cr)	15.78	8.75	8.52	2.32	1.61	3.62	**40.60**
Amount proposed to be capitalized	15.78	8.75	8.52	2.32	1.61	3.62	**40.60**

Table 307: Proposed Tariff for FY 2023-24 and FY 2024-25, as submitted by BEST

Category	Components of tariff FY 2023-24					Components of tariff FY 2024-25				
	Fixed Charges	Demand Charges	Energy Charges	Wheeling Charges	Average Billing Rate	Fixed Charges	Demand Charges	Energy Charges	Wheeling Charges	Average Billing Rate
	Rs./Month	Rs./KVA/ month	Rs./kVAh or Rs.kWh			Rs./Month	Rs./KVA/ month	Rs./kVAh or Rs.kWh		
HT Category										
HT - I Industry	-	470.00	6.12	0.84	8.69	-	480.00	6.19	0.92	8.88
HT - II Commercial	-	470.00	6.08	0.84	10.09	-	480.00	6.14	0.92	10.33
HT - III Group Housing	-	470.00	6.33	0.84	8.73	-	480.00	6.40	0.92	8.94
HT - IV (A) Railways	-	470.00	5.70	0.84	12.97	-	480.00	5.76	0.92	13.38
HT - V (A) Public services (Govt. Hospital & Educational Institutions)	-	470.00	5.82	0.84	8.48	-	480.00	5.93	0.92	8.71
HT - V (B) Public services (Others)	-	470.00	6.39	0.84	9.41	-	480.00	6.45	0.92	9.62
HT - VI Electrical Vehicle	-	70.00	4.99	0.84	-	-	70.00	4.99	0.92	-
LT Category										
LT - I (A) Residential (BPL)	11.00	-	1.22	2.26	3.70	12.00	-	1.23	2.48	3.95
LT - I (B) Residential										
0-100	110.00	-	1.90	2.26	4.73	120.00	-	1.92	2.48	5.02
101-300	160.00	-	4.77	2.26	7.99	170.00	-	4.81	2.48	8.30
301-500	160.00	-	7.83	2.26	10.51	170.00	-	7.88	2.48	10.81
501<	200.00	-	9.53	2.26	11.97	210.00	-	9.60	2.48	12.27
LT - II (a) Commercial	560.00	-	5.25	2.26	9.56	580.00	-	5.29	2.48	9.88
LT - II (b) Commercial >20 & <=50 kW	-	470.00	5.01	2.26	14.34	-	480.00	5.03	2.48	15.08
LT - II (c) Commercial >50	-	470.00	5.36	2.26	14.51	-	480.00	5.38	2.48	15.16
LT - III (A) Industry (upto 20 kW)	560.00	-	4.78	2.26	7.57	580.00	-	4.83	2.48	7.87
LT-III (b) Industrial	-	470.00	5.07	2.26	11.82	-	480.00	5.12	2.48	12.39
LT - IV (A) Public Services - Govt. Hosp. & Edu. Institutions)	560.00	-	5.47	2.26	7.80	580.00	-	5.58	2.48	8.13
LT - IV (B) Public Services - Others	560.00	-	5.47	2.26	8.00	580.00	-	5.53	2.48	8.28
LT-V (A) Agriculture- Pumpsets	-	50.00	2.34	2.26	-	-	60.00	2.37	2.48	-
LT-V (B) Agriculture- Others	-	120.00	3.76	2.26	6.05	-	130.00	3.80	2.48	6.28
LT VI Vehicle Charging	-	70.00	4.03	2.26	6.29	-	80.00	4.03	2.48	6.51

2. **Revamping of existing Distribution Substations- Installation of Additional Distribution transformers (DTs) and replacement of transformers with higher capacity, replacement of ONAN type DTs with Dry Type DTs and replacement of age old DTS at existing DSS (25 nos.) :-**

The augmentation of DSS has been undertaken based on clearances and permits issued by Municipal Corporation of Greater Mumbai (MCGM) and availability of sufficient space in existing DSS for installation of such equipments. The capacities of DSS are planned to be augmented either by installation of additional DTs or remodelling of DSS or by replacing the DTs with higher capacity DTs. Based on the requisitions received, BEST has proposed to add 49.21 MVA to 55.76 MVA capacities during the FY 2020-21 to FY2024-25 respectively.

Table no 12 : Capacity addition by new DSS and augmenting the existing DSS

Sr. No.	Rating kVA	FY 2020-21 No. of Tr. added				FY 2021-22 No. of Tr. added				FY 2022-23 No. of Tr. added				FY 2023-24 No. of Tr. added				FY 2024-25 No. of Tr. added			
		New DSS	Add. DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added	New DSS	Add .DT.	Higher cap.	MVA added
1	630	21	2	1	14.72	22	2	1	15.35	22	2	1	15.350	22	2	1	15.35	23	2	1	15.98
2	995	12	2	19	20.865	12	2	20	21.23	13	2	20	22.225	13	2	21	22.59	14	2	22	23.95
3	1600	7	0	4	13.62	7	0	4	13.62	7	0	5	14.225	8	0	5	15.825	8	0	5	15.825
MVA Add		36.37	3.25	9.59		37.00	3.25	9.95		38.00	3.25	10.56		39.60	3.25	10.92		41.22	3.25	11.29	
Total DT No.		40	4	24		41	4	25		42	4	26		43	4	27		45	4	28	
MVA Add		**49.205**				**50.20**				**51.800**				**53.765**				**55.755**			

Annexure-

Annexure-C

NEWLY COMMISSIONED DSS DURING FY 2023-24 (Table-A)

SR. No.	NAME OF THE DSS	No. of X'ers	Capacity	MVA Added	Month of Installation
1	SKY FOREST DSS	2	1600	3.2	Apr-23
2	MINERVA TOWER DSS	1	630	0.63	Apr-23
		1	1600	1.6	Apr-23
3	PARIJAT DSS	1	630	0.63	Apr-23
4	ARANYA 'C' TOWER DSS	1	1600	1.6	May-23
5	LODHA COMMERCIAL TOWER NO. 5 HV DSS	0	0	0	May-23
6	EV CHARGING NO. 1 DSS	2	1600	3.2	May-23
7	RENAISSANCE DSS	1	1600	1.6	Jun-23
8	WHISPERING HEIGHT DSS	1	2000	2	Jun-23
9	RIDDHI SIDDHI DSS	1	630	0.63	Jul-23
10	GALA ALTEZZA DSS	1	630	0.63	Aug-23
11	DHOBIGHAT NO. 2 DSS	1	630	0.63	Aug-23
12	DHOBIGHAT NO. 4 DSS	1	995	0.995	Aug-23
13	RAMESHWAR DSS	1	995	0.995	Sep-23
14	ARANYA SOUTH TOWER DSS	1	630	0.63	Nov-23
		1	995	0.995	Nov-23
15	LODHA VISTA DSS	1	995	0.995	Jan-24
16	ANTOP HILL MHADA DSS	1	995	0.995	Jan-24
17	SANGHVI HOSPITAL HV DSS	0	0	0	Feb-24
18	MTHL HV DSS	0	0	0	Feb-24
19	SWA-GRIHA CHSL DSS	2	995	1.99	Mar-24
20	Arab Building DSS	1	630	0.63	Apr-23
21	Shreepati Diamond DSS	1	1600	1.6	May-23
22	Arihant DSS	1	630	0.63	Jun-23
23	Mumbai central EV charging DSS	4	1600	6.4	Jul-23
24	Siddhant DSS.	1	995	0.995	Aug-23
25	Dada maharaj DSS	2	630	1.26	Sep-23
26	ABWA DSS	1	995	0.995	Jan-24
27	Square Construction	1	995	0.995	Feb-24
28	Bushra Heights	1	995	0.995	Feb-24
29	Coastal Road Priyadarshni HV DSS	--	--	0.00	Oct-23
30	Coastal Road Girgaon HV DSS	--	--	0.00	Feb-24
	TOTAL	**34**		**38.445**	**MVA**

REPLACEMENT OF X'ERS (HIGHER CAPACITY) DURING FY 2023-24 (Table-B)

SR. No.	NAME OF THE DSS	New Capacity	Old Capacity	Added Capacity	Month of Installation
1	FOSBERY ROAD DSS	995	630	365	Apr-23
2	ANANT BHAVAN DSS	995	630	365	Jun-23
3	TANTIA INDUSTRIAL ESTATE DSS	**1600**	995	605	Oct-23
		1600	995	605	
4	URBANIA REALTY LLP	995	630	365	Oct-23
5	ARANYA NORTH TOWER	1600	630	970	Nov-23
6	ARIHANT DEVELOPERS	995	630	365	Dec-23
7	PAREL ST STAND DSS	1600	995	605	Jan-24
8	Ashiyana DSS	995	630	365	Apr-23
9	Sindhi Lane DSS	995	630	365	Jun-23
10	Chandan Signature DSS.	995	630	365	Aug-23
11	Mid Colaba	995	400	595	Nov-23
12	Indian National Theater	995	630	365	Nov-23
13	Chatrapati Shivaji Marg (Transformer No 1)	1600	630	970	Dec-23
14	Chatrapati Shivaji Marg (Transformer No 2)	1600	995	605	Dec-23
15	Ekalavya DSS	995	630	365	Jan-24
		19550	**11310**	**8.24**	

-1-

REMODELLING OF DSS DURING FY 2023-24 (Table-C)

SR. No.	NAME OF THE DSS	No. of X'ers	Capacity In kVA	Month of Installation
1	DHARAVI ROAD DSS	2	1600 (ONAN)	Feb-24
	COTTON AVENUE DSS	0	0	Feb-24
2	Wadibunder DSS	1	630 (ONAN)	May-23
3	Sangeeta DSS	1	630 (ONAN)	Nov-23
4	Mumbadevi School DSS	1	1600 (ONAN)	Dec-23

INSTALLATION OF ADDITIONAL X'ERS DURING FY 2023-24 (Table-D)

SR. No.	NAME OF THE DSS	No. of X'ers Installed	Capacity (in KVA)	Added Capacity	Month of Installation
1	BORICHA MARG ANNEX	1	995	1.00	Nov-23
2	BEAU MONDE DSS	1	1600	1.60	Mar-24
3	Rare Villa DSS	1	630	0.63	Nov-23
4	Mid Colaba (Transformer No 2)	1	995	1.00	Dec-23
		4		**4.22**	

-2-

-3-

REPLACEMENT OF X'ERS (UNDER FAULT & 25 YEARS ABOVE) DURING FY 2023-24
(Table-E)

SR. No.	NAME OF THE DSS	New Installed X'er (kVA)	Old Replaced X'er (kVA)	Added Capacity	Month
1	ELITE RESIDENCY DSS	630	630	0	Apr-23
2	DHORWADI DSS	995	995	0	Apr-23
3	MOOSA KILLEDAR STREET DSS	630	630	0	Jun-23
4	WORLI INDUSTRIES DSS	995	995	0	Jun-23
5	RAHUL NAGAR DSS	630	630	0	Jun-23
6	PODDAR COLLEGE DSS	995	630	365	Jun-23
7	MEALLABLE IRON DSS	630	630	0	Jul-23
8	MAHALAXMI FLATNO. 1 DSS	995	630	365	Jul-23
9	WORLI DHOBIGHAT DSS	630	630	0	Jul-23
10	WORLI WEST DSS	630	630	0	Jul-23
11	RAOLI CAMP (W) DSS	995	995	0	Jul-23
12	AL RAZA DSS	630	630	0	Aug-23
13	SHAH INDUSTRIAL ESTATE DSS	1600	1600	0	Aug-23
14	S. M. ROAD DSS	995	995	0	Aug-23
15	JUBILEE BLOCK DSS	995	995	0	Sep-23
16	ALTIA NO. 2 DSS	1600	1600	0	Oct-23
17	SEWREE ROAD WEST DSS	630	630	0	Oct-23
18	BYCULLA FIRE BRIGADE DSS	630	630	0	Oct-23
19	CHOWNEY GULLY NORTH DSS	630	630	0	Nov-23
20	WADALA PUMPING DSS	630	630	0	Dec-23
21	Fergusson Annex DSS	630	630	0	May-23
22	Sammet Shikhar DSS	630	630	0	Jul-23
23	Mulji jetha DSS	995	995	0	Jul-23
24	Mumbadevi Static DSS	995	995	0	Jul-23
25	Rajram Mohan Roy DSS.	995	995	0	Nov-23
26	Wadiya Hospital DSS	1600	1600	0	Mar-24
27	Wilson Road	1600	1600	0	Mar-24
28	Imperial Tower South	630	630	0	Mar-24
29	Nabiullah New DSS.	1600	1600	0	Nov-23
30	Nabiullah New DSS.	1600	1600	0	Dec-23
		28370	**27640**	**0.73**	
NET ADDITION 0.6 MVA					

Detailed Justification for Delay in Completion of the DPR Schemes		
BEST Scheme Code	**MERC Approved No. with date**	**Remark/ Justification for delay in completion of DPR Schemes**
New Receiving Substations (RSS) Commissioning:		
BEST/FY16/01	MERC/CAPEX/FY 2016-17/ 00770 dated 28.09.2016	**Time-over run**: The DPR, originally scheduled to be closed by March, 2019, will now be finalized upon the completion of FY 2024-25. Despite this time over-run, there is no anticipated impact on the project's overall cost. The DPR Capitalisation cost remains within the approved cost. This DPR includes commissioning of M.G.M Hospital, Wankhede Stadium, Dosti Acres, Sai Sunder Nagar and Jerbai Wadia Road RSS. The reasons for the time over-run are given below. **M.G.M Hospital:** The plot for the commissioning of 2 T/F, 33kV RSS at M.G.M Hospital was handed over on 21.11.2013. The 33kV cables were laid from TPC Parel RS up to M.G.M. Hospital in F.Y.2016-17. Civil work was delayed due delay in finalization of tender and the actual construction work of RSS had commenced on 10.05.2018. Both civil and electrification work were completed in March 2020. Due to the lack of immediate load requirement from the surrounding area, the project was delayed to avoid unnecessary capital expenditure. Additionally, material shortages during the previous year further hindered progress. The current DPR will now be closed, and this work will be included in a new DPR. **Wankhede Stadium:** The scheme of commissioning of new RSS at Wankhede Stadium executed under IPDS in FY 2018-19. While obtaining in principle approval for IPDS DPR, the said scope of work except civil work was deleted from this DPR. Now, scheme is completed in all respect under IPDS. **Dosti Acres**: The handover of RSS site was delayed. Civil work on the proposed RSS commenced September 2018, and both civil and electrification work have been completed. A portion of 33kV cable

		has already been laid from TPC Antop Hill RS to the gate of Dosti Acres. Now, 1 No. of T/F has been commissioned, while the second T/F will be commissioned once additional demand is identified. Therefore, it has been decided to close this DPR. **Sai Sunder Nagar**: The developer handed over the RSS plot to BEST undertaking on 22.06.2017 for the commissioning of a 33kV RSS. The civil work on the proposed 33kV RSS commenced in Sept. 2018. However, due to the diversion of existing HV and LV cables on the plot, civil work has been delayed and remains stagnant. The current DPR will now be closed, and the remaining work will be included in a new DPR. **Jerbai Wadia Road**: The developer not showed interest in taking electric supply from BEST and approached M/s. TPC-D for obtaining power supply to this project. Hence, the scope of work of this scheme is deleted from this DPR. **"All Assets are Put To Use".** The scheme is old one & proposed to be closed before 31st March, 2025.
BEST/FY21/01	MERC/CAPEX /FY 2020-21/ Dated 16.07.2020	This DPR includes commissioning of Pimpalwadi, Spring Mill Chawl (Bombay Dyeing Mill) and Bharat Potdar Mill (India Blue) RSS. **Pimpalwadi**: The developer handed over the basement, ground, and first podium floors of Wing D building to BEST on 31.01.2018 for the purpose of construction of 1 No. of T/F, 33kV Receiving Substation. The construction of the RSS building, excluding minor finishing work such as flooring, painting, door and window installation, and electrical work, has been completed by the Party under the supervision of BEST. The 33kV cable laying work for the RSS has also been finished. However, the handover of the RSS building has been delayed due to ongoing minor civil works.

		Spring Mill Chawl (Bombay Dyeing Mill): The necessary EEBP approval have been obtained by Party for the commissioning of RSS. BEST has taken possession of the plot on May 28, 2024 for construction of RSS Building and accordingly, Soil Testing work is in progress. A tender will be floated for civil work once the soil testing results are available. The commissioning of equipment will be scheduled after the completion of civil and electrical work. **Bharat Potdar Mill (India Blue):** Civil work for the RSS has been completed, and Electrification work is currently underway. Equipment commissioning work is scheduled for FY 2025-26, with the entire scheme expected to be completed before March, 2026. The project was originally scheduled for completion by March 2025. However, there has been a delay in progress. A comprehensive review of the project status will be conducted before March 2025 to determine the appropriate course of action, including the potential closure of the scheme. **"All Assets are Put To Use".**
Augmentation / Replacement at existing RSS:		
BEST/FY16/02	MERC/TECH_V/CAP /DPR/20122013/02688 dated 22.02.2013	**Time-over run**: The DPR, originally scheduled to be closed by March 2016, was finalized on October 30, 2023. Despite the time overrun, the DPR capitalization cost remains within the approved budget. The reasons for the time overrun are given below. **Time-over run**: • The replacement of 10 MVAT/F by 16MVA T/F at Mahalaxmi Mazgaon Dock and Kussara was delayed due to non-receipt of additional load requirement from consumers, during FY 2019-20. The work was deferred due to urgent EHV cable diversion work by MMRC (Mumbai Metro Rail Corporation). During FY 2020-21 & FY 2021-22, the work was not completed in the target scheduled period due to COVID -19 and delay in material deliveries from the suppliers. • The replacement of 33kV &11 kV switchgear work was also delayed during FY 2019-20 due to urgent EHV cable diversion work of MMRC (Mumbai

		Metro Rail Corporation). During FY 2020-21 & FY 2021-22, the work was not completed in the target scheduled period due to COVID -19 and delay in material deliveries from the suppliers. • The supply, installation, and commissioning of AFF System at all RSS mentioned in this DPR has been delayed due to delay in tendering process. An earlier tender was cancelled due to high rates quoted by the suppliers. • Regarding the supply, installation and commissioning of Battery & Battery Charger, a contract was awarded to M/s. Chabbi Electricals Ltd. While the firm has partially executed the work, progress has been hindered by supplier related issues. • The 33 kV cable laying from TPC Carnac to Ballard Estate & Naval Dock Yard RSS is pending as our management has decided to replace all 45 kms of cables in south Mumbai under Turnkey contract. The necessary documentation for inviting tenders for this project is currently being prepared. The cable laying work at Mahalaxmi & Worli RSS is to be executed under IPDS Project (IPDS DPR No. MERC/CAPEX/2019-20/418 dated 26 July 2019). Due to delay in tendering process of IPDS, this work has also been delayed. Currently, cable laying at these locations is being carried out by the turnkey contractor M/s. L&T Ltd., under the IPDS project. ***Please note that this scheme is now closed on 30.10.2023 and copy of closure report is attached herewith as Annexure-A, Pg. No. 1 to 4.*** **"All Assets are Put To Use".**
BEST/FY17/02	MERC/CAPEX/2017-18 /4706 dated 16.11.2017	**Time-over run**: The DPR, originally scheduled to be closed by March 2020, was finalized on December 16, 2024. Despite the time overrun, the DPR capitalization cost remains within the approved cost. The reasons for the time overrun are given below. The replacement of 11 kV switchgear work at Mahim Causeway & Esplanade RSS was delayed due to two primary reasons. Firstly, urgent EHV cable diversion work by the Mumbai Metro Rail Corporation

		(MMRC) during FY 2019-20 necessitated the deferral of the project. Secondly, the COVID-19 pandemic and subsequent disruptions in the supply chain during FY 2020-21 and FY 2021-22 further hindered progress. • Given BEST's power factor of 0.99, the replacement of capacitors and reactors has been deferred. • The replacement of batteries and battery chargers at KEM RSS was delayed due to supplier-related issues exacerbated by the COVID-19 pandemic. • Cable laying for G.T Hospital, Girgaum Esplanade, and Marine Drive was not executed due to shortage of work force and funds for execution of scheme. ***Please note that this scheme is now closed on 16.12.2024 and copy of closure report is attached herewith as Annexure-A, Pg. No. 5 to 11.*** **“All Assets are Put To Use”.**
BEST/FY18/02	MERC/CAPEX/2017-18 /4706 dated 16.11.2017	**Time-over run**: The DPR, originally scheduled to be closed by March 2020, was finalized on December 16, 2024. There is no any impact due to time-over run. The DPR Capitalisation cost is within approved cost. The reasons for the time overrun are given below. • Replacement of 33 kV & 11 kV switchgear work at Ballard Estate and Mahim (2 Nos.) & Nepean Sea (1 No.) respectively was delayed due to two primary reasons. Firstly, urgent EHV cable diversion work by the Mumbai Metro Rail Corporation (MMRC) during FY 2019-20 necessitated the deferral of the project. Secondly, the COVID-19 pandemic and subsequent disruptions in the supply chain during FY 2020-21 and FY 2021-22 further hindered progress. • Given BEST's power factor of 0.99, the replacement of capacitors and reactors has been deferred. • Replacement of Battery & Battery Charger at Worli Dairy & 110 kV DBA RSS was delayed due to Covid-19 pandemic as there was problem at supplier’s end.

		• 33 kV cable laying from TPC Carnac to Ballard Estate (4 Km.) & part replacement of Hutatma Chowk, Marine Drive, G.T. Hospital, Colaba, Naval Dock Ballard Estate & Navy Nagar (Qty.; 29.26 km.). is deffered due to shortage of work force and funds for execution of schemes. ***Please note that this scheme is now closed on 16.12.2024 and copy of closure report is attached herewith as Annexure- A, Pg. No. 5 to 11.*** **"All Assets are Put To Use".**
BEST/FY18/02A	MERC/CAPEX/2019-20 /135 dated 10.05.2019	**Time-over run**: The DPR, originally scheduled to be closed by March 2020, was finalized on October 16, 2023 There is no any impact due to time-over run. The DPR Capitalisation cost is within approved cost. However, the reasons for the time overrun are given below.` • As per schedule, the work included in this DPR is required to be completed before March 2020. However, the civil work at Naval Dock RSS is deferred due to security reasons i.e., strict restrictions imposed on outside personnel entering in the naval premises by the Naval Authority. Because of which, considerable time had elapsed for security check of contractor personnel before entering in the naval premises each time. Now, civil work is completed. • The work included in this DPR is also deferred due to EHV cable diversion for MMRC (Mumbai Metro Rail Corporation). Since the MMRC work was of urgent in nature. ***Now, the scheme is closed on 16.10.2023 and closure Report is attached herewith as Annexure- A, Pg. No. 12 to 14.*** **"All Assets are Put To Use".**
BEST/FY20/02	MERC/CAPEX/DPR/2020-21/553 dated 15.12.2021	The scheme is for period 1st April, 2020 to March 2025. Now, the scheme is closed within timeline. ***Now, the scheme is closed on 16.12.2024 and closure Report is attached herewith as Annexure- A, Pg. No. 15 to 18.***

		"All Assets are Put To Use".
BEST/FY21/02	MERC/CAPEX/DPR/2022-23/556 dated 14.11.2022	The scheme, which was initiated on April 1, 2021, and was scheduled to conclude by March 31, 2023, was delayed due to the impact of the COVID-19 pandemic. ***Now, the scheme is closed on 16.12.2024 and closure Report is attached herewith as Annexure-A, Pg. No. 19 to 21.*** **"All Assets are Put To Use".**
New Distribution Substation & Augmentation & alteration to existing DSS:		
BEST/FY21/03	MERC/CAPEX/2020-21/552 dated 15.12.2021	The scheme, which commenced in April 2020 and was originally scheduled to be completed by March 2025, is currently in progress. The scheme is now expected to be closed in FY 2026-27.(WIP) **"All Assets are Put To Use".**
Extension of Distribution Network:		
BEST/FY21/04	MERC/CAPEX/2020-21/dated 22.06.2020	The scheme, which commenced in April 2020 and was originally scheduled to be completed by March 2025, is currently in progress. The scheme is now expected to be closed in FY 2026-27. (WIP) **"All Assets are Put To Use".**
SCADA, Computerisation & digitisation:		
BEST/FY18/08A	MERC/CAPEX/2017-18 / 4759 dated 22.11.2017	**Time-over run:** The DPR, originally scheduled to be closed by March 2021, was finalized on November 11, 2022. There is no any impact due to time-over run. The DPR Capitalisation cost is within approved cost. The reasons for the time overrun are given below. • For implementation of SCADA system for new and existing RSS was delayed due to preparation of RFP and tendering process. Further, tender was invited but same was not materialized due to NIL response. In the mean-time BEST had formed a special study team to combine various automation

		projects. Accordingly, proposal was prepared by combining requirement of zones SCADA, DMS, OMS and put up for management approval. However, due to higher cost, the same proposal was kept on hold by management. After that, it was planned to invite a tender specifically for the Backbay RSS SCADA system. However, the launch of the RDSS by the Ministry of Power, Government of India, prompted BEST management to decide that the SCADA project would be executed under the RDSS framework. As a result, this DPR has been closed ***Now, the scheme is closed on 11.11.2022 and closure Report is attached herewith as Annexure-A, Pg. No. 22 & 23.*** **"All Assets are Put To Use".**
BEST/FY18/08B	MERC/CAPEX/2017-18/47886 dated 13.12.2017	**Time-over run**: The DPR, originally scheduled to be closed by March 2020, was finalized on December 16, 2024. Despite the significant delay, the DPR capitalization cost remains within the approved cost. The reasons for the time overrun are given below. • Initially, BEST intended to execute the Digitization System project independently. Consequently, a DPR was submitted and approved by MERC. However, MCGM subsequently informed BEST of the need to adopt a common GIS software platform to align with MCGM's systems. MCGM has deployed its staff to execute this project within BEST, and all associated costs will be borne by MCGM. As a result, no further expenditure is anticipated for this project. ***Now, the scheme is closed on 16.12.2024 and closure Report is attached herewith as Annexure-A, Pg. No.24 & 25.*** **"All Assets are Put To Use".**
Integrated Power Development Scheme (IPDS):		
IPDS/BEST/FY15-16/01	MERC/CAPEX/2019-20/418 dated 26.07.2019	The scheme, originally scheduled to be completed by March 2020, was finalized on March 31, 2021. The delay in completion was attributed to prolonged

		tendering processes, material delivery delays, and the impact of the COVID-19 pandemic.` ***Now, the scheme is closed on 16.12.2024 and closure Report is attached herewith as Annexure-A, Pg. No. 26 to 28.*** **"All Assets are Put To Use".**
Energy Meter		
BEST/FY15-16/01 (Energy Meter)	MERC/CAPEX/2019-20 /116 dated 18.04.2019	The scheme for IPDS Energy Meter was for period 1st April, 2018 to 31st March 2020. The scheme is closed within time line as approved by MERC and IPDS. ***Now, the scheme is closed on 07.06.2021 and closure Report is attached herewith as Annexure-A, Pg. No. 29 & 30.*** **"All Assets are Put To Use".**
BEST/FY19/06	MERC/CAPEX/2019-20 /1110 dated 28.11.2019	The scheme was completed within timeline and all objective of the scheme is achieved. ***Now, the scheme is closed on 26.04.2024 and closure Report is attached herewith as Annexure-A, Pg. No. 31 to 33.*** **"All Assets are Put To Use".**

0/c

Annexure-A

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

TELEPHONE : (022) 22856262
FAX : (022) 22851244
TELEX : 1185755 BEST IN
TELEGRAM : BEST, MUMBAI-400 001.

BEST BHAVAN,
BEST MARG,
POST BOX NO. 192.
MUMBAI - 400 001.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

OUR REF. ESO/CEPL/Adm9(B)/MERC/ 85 /2023

DATE : 30 OCT 2023

To,

The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report for DPR Scheme 'Revamping of Existing Receiving Substations' BEST Code- BEST/FY16/02.

Ref: DPR approved by the Hon'ble Commission vide Letter reference No. MERC/TECHV/CAP/DPR/20122013/02688 dated 22nd February2013.

Dear Sir / Madam,

This has reference to the Capital Scheme MERC Reference No. MERC/TECHV/CAP/DPR/20122013/02688 dated 22nd February2013 (BEST Reference No. BEST/FY16/02) for "Revamping Existing Receiving Substations" for FY 2015-16. The Hon'ble Commission has accorded in-principle approval for subject DPR with Costing of Rs.36.63 Cr. This scheme is to be closed as the scope of work under approved DPR is almost completed and balance if any work will be included in new DPR. Also, this DPR is old one; therefore, we are submitting the Scheme Closure Report of the Scheme as *Appendix* to this submission.

Yours faithfully,

(S. P. Makwana)
Chief Engineer (Planning)

CHIEF ENGINEER (PLANNING) OFFICE B.E.S. & T. UNDERTAKING

OFFICE OF THE MAHARASHTRA ELECTRICITY REGULATORY COMMISSION, CUFFE PARADE

"BEST Travel Saves Fuel"

PROJECT COMPLETION REPORT

Name of the Scheme	'Revamping Existing Receiving Substations' (2015-16)
BEST Scheme Code	BEST/FY16/02
MERC Reference No.	MERC/TECH_V/CAP/DPR/20122013 /02688 dated 22nd February 2013.
Objective of the Scheme (As per DPR)	To meet increasing load in area of supply and to improve quality and reliability of supply

Scheduled / Actual completion dates:

Scheduled date of starting	1st April 2015
Actual date of starting	1st April 2015
Scheduled date of completion	31st March 2016
Actual date of completion	31 March 2023
Scope of Work (As per DPR)	• Replacement of 10 MVA T/F by 16 MVA at RSS- Worli, Kussara, Mahalaxmi (2 Nos each) and Mazgaon Dock, PMGP (1 No each) (Qty- 8 Nos.) • Replacement of 33 kV switchgears at RSS – Mumbadevi, Mahim Causeway, Worli Dairy (2 Nos each), Masjid, Mumbai Central, Sion Fort (1 No each) (Qty- 9 Nos.) • Replacement of 11 kV switchgears at RSS – Mumbadevi, Love Grove, Wadala, Navy Nagar (1 No each), Grant Road (2 Nos.) & Naval Dock (3 Nos.) (Qty- 9 Nos.) • Replacement / installation of Capacitors at RSS-Dharavi, Sion Fort, Worli, Parel (2 Nos each) (Qty- 8 Nos.) • Replacement / installation of Reactors at RSS- Sion Fort, Grant Road, Byculla (2 Nos. each), Naval Dock, Mahalaxmi (1 No each) (Qty- 8 Nos.) • Replacement of Battery and Charger at RSS- Naval Dock, Parel, Marine Drive, Mahim, KEM Hospital, Kingsway & Worli (Qty- 7) • Replacement of AFF System at RSS- Girgaum, Masjid, Mumbadevi, Nair Hospital, Worli Dairy & Nestle (CO_2Type Qty-6) • 33 kV cable replacement of RSS- Worli, Ballard Estate, Mahalaxmi, Colaba (6.18 kms)
Actual completed work	**FY2015-16:** 1) Replacement of T/F at PMGP & Worli RSS. 2) Replacement of 11kV Bus Sections at Mumbadevi & Wadala RSS. **FY2016-17:** 1) Replacement of 11KV Bus sections at Wadala, Mumbadevi & Naval Dock RSS.

	2) Installation of capacitor at Worli & Parel RSS. **FY2017-18 & FY 2018-19:** 1) Replacement of 11KV Bus Section & reactor at Naval Dock RSS. 2) Replacement of Capacitor at Worli RSS. 3) Replacement of 33KV Switchgears at Worli Dairy RSS. 4) Replacement of Battery Set at Parel RSS. **FY2019-20:** 1) Replacement of Earthing and T/F at Kussara RSS. 2) Replacement of Battery and Charger at Parel, Marine Drive, Worli, Kingsway and Naval Dock RSS 3) Installation of Earthing at Masjid, Kussara, Mumbadevi & Mumbai Central RSS 4) Replacement of 33 kV switchgears at Worli dairy. 5) Replacement of T/F at Kussara RSS 6) Reactor installed at Neval Dock RSS 7) AFF installed at Nestle RSS. **FY2020-21:** 1) Installation of Earthing at Masjid, Kussara, Mumbadevi & Mumbai Central RSS. 2) Replacement of Battery Set at Kingsway & Worli RSS. 3) Installation of AFF System (CO2) at Nair Hospital **FY2021-22:** Earthing at Worli, Kussara & Mazgaon Dock RSS **FY2022-23:** 1) Earthing at Mumbadevi & Mazgaon Dock RSS 2) Installation of 33 kV Sw./Gr. at Sion Fort RSS. 3) AFF System at Girgaum, Masjid and Nair Hospital.
Pending Work if any	• Replacement of 10 to 16 MVA transformers at RSS – Kussara (Qty-1) Mazgaon Dock (Qty-1 No. each) and Mahalaxmi (Qty-2 Nos.). • 33 kV switchgear replacement at RSS:– Mahim Causeway, Mumbadevi (2 Nos. each), Masjid (1 No each) • 11 kV Bus Section replacement at RSS:– Grant Road (Qty-2) • Installation of Capacitors- Dharavi, Sion Fort & Parel RSS (Qty-2 each) • Installation of Reactors: - Sion Fort, Grant Road, Byculla (2 Nos. each), Mahalaxmi (1 No each) (Qty- 7 Nos.) • Replacement of Battery and Charger at Mahim & KEM Hospital • 33 kV cable replacement of RSS- Ballard Estate & Colaba
Reason for delay if any	• Replacement of 10 MVAT/F by 16MVA T/F at Mahalaxmi Mazgaon Dock and Kussara is delayed due to non receipt of additional load requirement from consumers, during FY 2019-20, the work was deferred due to urgent EHV cable diversion work of MMRC (Mumbai Metro Rail Corporation) and during FY 2020-21 & FY 2021-22, the work was not completed in the target scheduled period due to COVID -19 and delay in material deliveries from the suppliers. • Replacement of 33kV &11 kV switchgear work was delayed

	because, during FY 2019-20, the work was deferred due to urgent EHV cable diversion work of MMRC (Mumbai Metro Rail Corporation) and during FY 2020-21 & FY 2021-22, the work was not completed in the target scheduled period due to COVID -19 and delay in material deliveries from the suppliers. • The job of supply, installation, and commissioning of AFF System at all RSS mentioned in this DPR is delayed due to delay in tendering process. Earlier tender was invited for the same, but it was cancelled due to higher rates quoted by the suppliers. • For supply installation and commissioning of Battery & Battery Charger, a contract was awarded to the firm M/s. Chabbi Electricals Ltd. The firm has executed some work; balance work is delayed due supplier's problems at their end. • 33 kV cable laying from TPC Carnac to Ballard Estate & Naval Dock Yard RSS is pending as our management has decided to replace all 45 kms of cables in south Mumbai under Turnkey contract and preparation of document for inviting tender is in progress. • Cable laying at Mahalaxmi & Worli RSS is to be executed under IPDS Project (IPDS DPR No. MERC/CAPEX/2019-20/418 dated 26 July 2019). Hence due to delay in tendering process of IPDS, scheme is delayed. At present cable is laid by the turnkey contractor firm M/s. L&T Ltd. Under IPDS.
Reason for cost overrun if any	-

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.36.63 Crore	Rs. 14.20 Crore

Extent to which scope and objective were achieved:

i. Except Mahalaxmi RSS (2 Nos.), Kussara & Mazgaon Dock RSS (1 No. each), all other work related to replacement of T/Fs in the DPR is completed in all respect.

1 No. of T/F at Worli RSS is replaced under IPDS. Hence scope of work is deleted from this DPR.

ii. Except Mumbadevi RSS & Masjid RSS (1 No.), all other work related to replacement of 33 kV Switchgears in the DPR is completed in all respect.

Mahim Causeway (2 Nos) and Sion Fort (1 No.) was deleted from the scope of work of this DPR and included in BEST/21/02 & BEST/ 20/02 DPR respectively. Also Mumbai Central work was executed in IPDS scheme. Hence scope of work of above RSS is deleted from this DPR.

iii. All work related to replacement of 11 kV switchgears in the DPR is completed in all respect. Except Grant Road RSS, this is covered in BEST 20/02 DPR. Hence scope of work of above RSS is deleted from this DPR.

iv. Due to execution of this DPR, reliability and quality of supply is improved

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The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080

Email ID : depro@bestundertaking.com

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

ESO/CEPL/Adm-9(B)/MERC/ 194 /2024

DATE : 16 DEC 2024

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report for DPR Scheme 'Revamping of Existing Receiving Substations' Capital Investment Scheme for FY 2016-17 to 2019-20).

Ref: MERC MERC/CAPEX /2017-18/4706 dated 16th November 2017.

Dear Sir / Madam,

This has reference to the Capital Scheme MERC Reference No. MERC/CAPEX /2017-18/4706 dated 16th November 2017 (BEST Reference No. BEST/FY17/02 and BEST/FY18/02) for "Revamping Existing Receiving Substations" for FY 2017-18 to FY2019-20. The Hon'ble Commission has accorded in-principle approval for subject DPR with Costing of Rs.64.09 Cr and 58.86 Cr. This scheme is to be closed as the scope of work under approved DPR is almost completed and balance if any work will be included in new DPR. Also, this DPR is old one; therefore, we are submitting the Scheme Closure Report of the Scheme as *Appendix* to this submission.

Yours faithfully,

16/12/2024

(S.S.Adlinge)
Dy.Chief Engineer (RC-1)

DCE REVIEW COMMITTEE-I BEST

16/12/2024

OFFICE OF THE MAHARASHTRA ELECTRICITY REGULATORY COMMISSION WTC, CUFFE PARADE, MUMBAI ... 05.

Appendix-A

PROJECT COMPLETION REPORT

Name of the Scheme	'Revamping Existing Receiving Substations' (2016-17 to 2019-20)
BEST Scheme Code	BEST/FY17/02
MERC Reference No.	MERC/CAPEX/2017-18/4706 dated 16th November 2017.
Objective of the Scheme (As per DPR)	To meet increasing load in area of supply and to improve quality and reliability of supply

Scheduled / Actual completion dates:

Scheduled date of starting	1st April 2016
Actual date of starting	1st April 2014
Scheduled date of completion	31st March 2020
Actual date of completion	31 March 2024
Scope of Work (As per DPR)	• Replacement of 10 MVA T/F by 16 MVA at PMGP & Sewree RSS (Qty- 2Nos.) • Replacement of 33 kV switchgears at PMGP & KEM RSS – (Qty- 2 Nos.) • Replacement of 11 kV switchgears at RSS – PMGP (1 No.), Mahim Causeway (2 Nos.), Sion Fort (2 Nos.) & Esplanade (3 Nos.) (Qty- 8Nos.) • Replacement of Battery and Charger at RSS- G.T. Hospital, Khetwadi, KEM , Esplanade, Nepean sea, Mahim Causeway (Qty-6) • 33 kV cable laying from TPC Dharavi fort PMGP RSS. • 33 kV cable replacements on L.T. Marg from Metro Junction to Mohd. Ali Road for G.T. Hospital, Esplanade, Girgaum, Malabar Hill, Marine Drive RSS, Cable on Apollo Bunder & Diversion of connection point of KEM & Kingsway RSS, Cable from TPC Mahalaxmi to Prabhadevi RSS.
Actual completed work	**FY2014-15, FY2015-16 & FY2016-17**: 1) 33 kV cable laid from Malabar Hill to Birla Krida Kendra Girgaum. TPC Mahalaxmi to Prabhadevi RSS. 2) In addition to above, in FY 2016-17, T/F No.3 at Sewree RSS (WIP) and Battery & Battery Charger are replaced at Mahim Causeway. **FY2017-18**: 1) Replacement of T/F at Sewree RSS. 2) Replacement of Battery & Battery Charger at Naval Dock RSS. 3) 33 kV cable laid from TPC Dharavi to PMGP RSS & K'way to KEM RSS (WIP). **FY2018-19**: 1) 33 kV cable laid from Kingsway to KEM RSS.

	2) Installation of 11 kV bus section at Sion Fort RSS (WIP). **FY2019-20:** 1) Replacement of 11 kV Bus Section No.1 at Sion Fort RSS. 2) Replacement of Battery and Charger at Nepean Sea, KEM & Esplanade RSS (WIP). 3) AFF CO_2 Type at 110 kV Backbay RSS (WIP). **FY2020-21& FY 2021-22:** 1) Replacement of Battery and Charger at Esplanade, Khetwadi & G.T. Hospital RSS. 2) Installation of AFF CO_2 Type at 110 kV Backbay RSS. **FY2022-23:** 1) Installation of 33/11 kV, 16 MVA T/F, 33 kV & 11 kV Switchgears, AFF & CARP at PMGP RSS (WIP). 2) Installation of 11 kV Bus Section No. 2 at Sion Fort RSS. 3) AFF System at Nariman Point RSS. 4) Cable laying for Kingsway & Prabhadevi RSS. **FY2023-24:** 1) Installation of T/F, 33 kV & 11 kV Sw/grs at PMGP 2) Cable laying at PMGP RSS.
Pending Work if any	• 33 kV switchgear replacement at KEM RSS (1 No.) • 11 kV Bus Section replacement at RSS: – Mahim Causeway (2 Nos.) & Esplanade (3 Nos.) • Installation of Capacitors & Reactor at PMGP RSS. • Replacement of Battery and Charger at KEM RSS. • Cable laying for G.T Hospital, Girgaum Esplanade, Marine Drive.
Reason for delay if any	• Replacement of 11 kV switchgear work at Mahim Causeway & Esplanade RSS was delayed because, during FY 2019-20, the work was deferred due to urgent EHV cable diversion work of MMRC (Mumbai Metro Rail Corporation) and during FY 2020-21 & FY 2021-22, the work was not completed in the target scheduled period due to COVID -19. • Power Factor of BEST is 0.99, therefore, the replacement of Capacitor & Reactor is deferred. • Replacement of Battery & Battery Charger at KEM RSS was delayed due to Covid-19 pandemic as there was problem at supplier's end. • Cable laying for G.T Hospital, Girgaum Esplanade, and Marine Drive was not executed due to shortage of work force and funds for execution of scheme.
Reason for cost overrun if any	-

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.64.09 Crore	Rs. 39.53 Crore

Extent to which scope and objective were achieved:

i. Except 11 kV switchgears at Mahim Causeway (2 Nos.), Esplanade (3 Nos.) and cable laying schemes at L.T. Marg to Marine Drive, G.T. Hospital, Girgaum, Malbar Hill, Battery & Charger at KEM all other work included in this DPR is completed in all respect.

ii. Pending work including balance 33 kV cable laying is included in RDSS DPR. Therefore, capitalization cost is less (Rs.39.53 Cr) as compared to the approved cost (Rs.64.09 Cr).

iii. Due to execution of this DPR, reliability and quality of supply is improved

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Appendix-B

PROJECT COMPLETION REPORT

Name of the Scheme	'Revamping Existing Receiving Substations' (2016-17 to 2019-20)
BEST Scheme Code	BEST/FY18/02
MERC Reference No.	MERC/CAPEX/2017-18/4706 dated 16th November 2017.
Objective of the Scheme (As per DPR)	To meet increasing load in area of supply and to improve quality and reliability of supply

Scheduled / Actual completion dates:

Scheduled date of starting	1st April 2016
Actual date of starting	1st April 2016
Scheduled date of completion	31st March 2020
Actual date of completion	31 March 2024
Scope of Work (As per DPR)	• Replacement of 10 MVA T/F by 16 MVA at Ballard Estate(1 No.) , Prabhadevi(1 No.) , Sewree RSS (2 Nos.) & Love Grove RSS (2 Nos.) (Qty- 6 Nos.) • Replacement of 33 kV switchgears at Sewree (2 Nos.), G.T. Hospital (2 Nos.) & Ballard Estate (1 No.) (Qty-5 Nos.) • Replacement of 11 kV switchgears at RSS – Ballard Estate (1 No.), Mahim (2 Nos.), Nepean Sea (3 Nos.) and Malabar Hill (1 No.) (Qty- 7 Nos.) • Replacement of HT Capacitor & Reactor at Ballard Estate RSS. • Replacement of Battery at Sion Fort, DBA, Lalbaug, Worli Dairy, J,J,Hospital, Elphinston Mill, Tardeo RSS & Peninsula Land HT Room.(Qty-8) • Battery Charger at Sion Fort, DBA& Lalbaug RSS. (Qty.3 Nos.) • 33 kV cable laying from TPC Carnac to Ballard Estate RSS (4 Km) • 33 kV cable replacements in part for Hutatma Chowk, Marine Drive, G.T. Hospital, Colaba, Naval Dock Ballars Estate & Navy Nagar (Qty.; 29.26 kM.).
Actual completed work	**FY2016-17**: Replacement of 11 kV bus section at Malabar Hill RSS. **FY2017-18 & 2018-19:** Replacement of T/F & accessories at Love Grove RSS. **FY2019-20**: 1. Installation of Earthing at Prabhadevi RSS. 2. Installation of Battery & Charger at J.J. Hospital.

	FY 2020-21 & FY 2021-22: **1.** Earthing & Replacement of 33 KV Switchgears at Sewree RSS. **FY2022-23:** 1) Installation of 33 kV switchgears at Sewree RSS and G.T. Hospital, 2) Installation of Battery & Charger at Tardeo, Lalbaug, Peninsula Land & Sion Fort RSS. 3) Earthing at Prabhadevi, G.T. Hospital & Ballard Estate RSS. **FY2023-24**: Installation of 11 kV bus sections at Nepean sea RSS.
Pending Work if any	• Replacement of Transformers at RSS – Ballard Estate (1 No.), Love Grove (1 No), Prabhadevi (1 No.), and Sewree (1 No.) (Qty-4 Nos.). • 33 kV switchgear replacement at RSS: – Ballard Estate (1 No.) • 11 kV Bus Section replacement at RSS: – Ballard Estate (1 No.), Mahim (2 Nos.) Nepean Sea (1 No.) (Qty.: 4 Nos.) • Installation of Capacitors & Reactor at Ballard Estate RSS. • Replacement of Battery Charger at Worli Dairy & 110 kV DBA RSS. • 33 kV cable laying from TPC Carnac to Ballard Estate RSS (4 Km) • 33 kV cable replacements in part for Hutatma Chowk, Marine Drive, G.T. Hospital, Colaba, Naval Dock Ballars Estate & Navy Nagar (Qty.; 29.26 kM.).
Reason for delay if any	• Replacement of 33 kV & 11 kV switchgear work at Ballard Estate and Mahim (2 Nos.) & Nepean Sea (1 No.) respectively was delayed because, during FY 2019-20, the work was deferred due to urgent EHV cable diversion work of MMRC (Mumbai Metro Rail Corporation) and during FY 2020-21 & FY 2021-22, the work was not completed in the target scheduled period due to COVID -19 and delay in material deliveries from the suppliers. • Power Factor of BEST is 0.99, therefore, the replacement of Capacitor & Reactor is deferred. • Replacement of Battery & Battery Charger at Worli Dairy & 110 kV DBA RSS was delayed due to Covid-19 pandemic as there was problem at supplier's end. • 33 kV cable laying from TPC Carnac to Ballard Estate (4 Km.) & part replacement of Hutatma Chowk, Marine Drive, G.T. Hospital, Colaba, Naval Dock Ballard Estate & Navy Nagar (Qty.; 29.26 km.). is deffered due to shortage of work force and funds for execution of schemes.
Reason for cost overrun if any	-

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.58.86 Crore	Rs. 9.25 Cr

Extent to which scope and objective were achieved:

1. The T/Fs at Love Grove (1 No), Prabhadevi (1 No.) was installed under IPDS DPR. Hence the scope of work is deleted from this DPR.

2. Now, balance work is included in RDSS DPR, hence same may be deleted from this DPR.

iv. Due to execution of this DPR, reliability and quality of supply is improved

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SPRO

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

TELEPHONE : (022) 22856262
FAX : (022) 22851244
TELEX : 1185755 BEST IN
TELEGRAM : BEST, MUMBAI-400 001.

BEST BHAVAN,
BEST MARG,
POST BOX NO. 192.
MUMBAI - 400 001.

ADDRESS ALL COMMUNICATION BY TITLE
NOT BY NAME

OUR REF. : **ESO/CEPL/Adm9(B)/MERC/ 81 /2023**

DATE : 16-10-2023

To,

The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report for DPR Scheme 'Revamping of Existing Receiving Substations' (BEST Code No. - BEST/FY18/02A).

Ref: DPR approved by the Hon'ble Commission vide Letter reference No. MERC/CAPEX/DPR/2019-20/135 dated 10.05.2019.

Dear Sir / Madam,

This has reference to the Capital Investment Scheme (BEST Code No. BEST/FY18/02A) for "Revamping of Receiving Substations" for FY2017-18 to FY 2019-20. The Hon'ble Commission had accorded in principle approval for subject DPR (Scheme MERC approved value Rs. 15.58 Crore) vide above referred MERC letter on 10th May 2019. This scheme is to be closed as the scope of work under this approved DPR is almost completed. Pending work (replacement of 11 kV switchgears at Masjid, Love Grove RSS and installation of T/F at Naval Dock RSS) will be included in new DPR scheme. We are submitting the Scheme Closure Report of the subject Scheme as *Appendix* to this submission.

The Hon'ble commission is kindly requested to consider the attached scheme closure report.

Yours faithfully,

(S. P. Makwana)
Chief Engineer (Planning)

OFFICE OF THE
MAHARASHTRA ELECTRICITY
REGULATORY COMMISSION
WTC, CUFFE PARADE, MUMBAI - 400 005.
17/10/2023

DEPTY
16/10/23.

"BEST Travel Saves Fuel"

Appendix

PROJECT COMPLETION REPORT

Name of the Scheme	'Revamping of Receiving Substations' (FY 2017-18, FY2018-19 & FY2019-20)
BEST Scheme Code	BEST/FY18/02A
MERC Code No.	MERC/CAPEX/2019-20/135 dated10.05.2019
Objective of the Scheme (As per DPR)	To meet increasing load in area of supply and to improve quality and reliability of supply.

Scheduled / Actual completion dates:

Scheduled date of Starting	1st April 2017 (FY 2017-18)
Actual date of Starting	1st April 2017 (FY 2017-18)
Scheduled date of completion	31st March 2020 (FY 2019-20)
Actual date of completion	31st March 2022 (FY 2021-22)
Scope of Work (As per DPR)	• Installation of additional T/Fs at 110 kV DBA (2 Nos) & Naval Dock, Sitaladevi RSS (1 No. each). • Replacement of 33 kV AIS 1800 MVA bus sections (Switchgears& Accessories) 2 Nos. at 110 kV Khetwadi RSS and 33 kV, 1500 MVA, Switchgears at Naval Dock RSS (Qty- 1 No.). • Replacement of 11 kV, switchgears & accessories at Nestle, Love Grove, Malbar Hill & Masjid RSS.
Actual completed work	**FY2017-18**: 1) Replacement / installation of 11 kV Bus Sections at Nestle & Naval Dock RSS. 2) Installation of additional T/F at Sitaladevi RSS. 3) Installation of earthing electrode, CARP, 33 kV switchgears & 11 kV Bus sections at 110 kV, DBA RSS (**Capitalization - 4.33 Cr**.). **FY2018-19**: 1) Installation of earthing, T/F, 11kV bus sections, NIFP at 110 kV DBA RSS. 2) Civil work & Electrical work at DBA RSS. 3) Installation of 11 kV switchgears & CARP at Naval Dock RSS for additional T/F (T/F No.4) 4) Installation of 11 kV & 33 kV switchgears, T/F, earthing, CARP atSitaladevi RSS. **(Capitalization -5.80 Cr)**. **FY2019-20 & FY2020-21:**1) Installation of NIFP System at 110 kV DBA RSS. 2) Installation of 33 kV AIS bus sections at 110 kV, Khetwadi RSS (**Capitalization -2.79 Cr. & 1.83 Cr.).** **FY2021-22**: Installation of T/F and civil work at Naval Dock RSS **(Capitalisation -0.73 Crs.).**
Pending Schemes / Work if any	1) Replacement of 11 kV switchgears at Masjid RSS. The scheduledwork is executed under IPDS; hence the scheme is deleted from this DPR.

	2) Scheme of replacement of 11 kV switchgears at Love Grove RSS (Qty-1). 3) Installation of additional T/F at Naval Dock RSS
Reason for delay if any	1) As per schedule, the work included in this DPR is required to be completed before March 2020. However, the civil work required for installation & commissioning of T/F at Naval Dock RSS is deferred due to security reasons i.e., strict restrictions imposed on outside personnel entering in the naval premises by the Naval Authority. Because of which, considerable time had elapsed for security check of contractor personnel before entering in the naval premises each time. Now, civil work is completed. 2) The work included in this DPR is also deferred due to EHV cable diversion for MMRC (Mumbai Metro Rail Corporation). Since the MMRC work was of urgent in nature.
Reason for pending work at Naval Dock RSS and Not considering the T/F cost in DPR	1. Transformer installation work at Naval Dock is pending due to non-availability of 33/11-6.6 kV D/R T/F. Earlier it was decided to install old 10/12.5 MVA, 22/11-6.6 kV, Sr. No. 90WF-003/6, Kirloskar Make, T/F Manufacturing year 1992 removed from Cumbala Hill RSS. But due heavy oil leakage, it was decided 'Not to Install' old T/F. 2. Being an old transformer, the depreciated cost of the transformer is worked out and same is considered as Unit cost of the transformer. Depreciated / residual value of power transformer is Rs.340093.00. Hence, in cost Sheet the cost of T/F is considered as NIL.
Reason for cost overrun if any	-

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.15.58 Crore	Rs.15.48 Cr.

Extent to which scope and objective were achieved:

1. Except replacement of 11 kV switchgears at Masjid, Love Grove RSS and installation of T/F at Naval Dock all other work included in the DPR is completed in all respect.

2. Due to execution of this DPR, reliability and quality of supply is improved.

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o/c

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080

Email ID : depro@bestundertaking.com

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ESO/CEPL/Adm9(B)/MERC/ 195 /2024

DATE : 16 DEC 2024

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report for DPR Scheme 'Revamping of Existing Receiving Substations' Capital Investment Scheme for FY 2019-20 to 2024-25 (BEST Reference No. BEST/FY20/02).

Ref: MERC/CAPEX /2020-21/553 dated 15th December, 2021.

Dear Sir / Madam,

This has reference to the Capital Scheme MERC Reference No. MERC/CAPEX /2020-21/553 dated 15th December, 2021 (BEST Reference No. BEST/FY20/02) for "Revamping Existing Receiving Substations" for FY 2019-20 to 2024-25. The Hon'ble Commission has accorded in-principle approval for subject DPR with Costing of Rs.40.60 Cr. This scheme is to be closed as the scope of work under approved DPR is almost completed and balance if any work will be included in new DPR. Therefore, we are submitting the Scheme Closure Report of the Scheme as *Appendix* to this submission.

Yours faithfully,

DCE REVIEW COMMITTEE-I BEST

(S.S.Adlinge)
Dy.Chief Engineer (RC-1)

16/12/2024

OFFICE OF THE
MAHARASHTRA ELECTRICITY
REGULATORY COMMISSION
WTC, CUFFE PARADE, MUMBAI - 400 005.

Appendix-A

PROJECT COMPLETION REPORT

Name of the Scheme	'Revamping Existing Receiving Substations' (2019-20 to 2024-25)
BEST Scheme Code	BEST/FY20/02
MERC Reference No.	MERC/CAPEX /2020-21/553 dated 15th December, 2021.
Objective of the Scheme (As per DPR)	To meet increasing load in area of supply and to improve quality and reliability of supply

Scheduled / Actual completion dates:

Scheduled date of starting	1st April 2019
Actual date of starting	1st April 2019
Scheduled date of completion	31st March 2025
Actual date of completion	31 March 2024
Scope of Work (As per DPR)	• Installation of additional Transformer, 16 MVA, 33/11 kV and associated equipments at Nepean Sea and Kingsway RSS (Qty-2Nos.) • Replacement of 16 MVA, 33/11 kV Transformer at Grant Road RSS (Qty- 1 Nos.) • Installation of additional 1 no. of 33 kV, 1500 MVA, RMU at Avighna, 33/0.415 kV DSS (Qty. 1 No.) • Replacement/Installation of 33kV, 1500 MVA, AIS Bus Section at Elphinstone Mill RSS (Qty.:- 2 Nos.) • Replacement of 33 kV, 1500 MVA, switchgears at Mazgaon Dock (1 No.), Sion Fort (2 Nos.), Colaba (1No.), Nepean Sea (2 Nos.), Kingsway(2Nos.), Mahim (2 Nos.) and Dharavi (3 Nos.) (Total Qty- 13 Nos.) • Replacement of 11 kV switchgears at Grant Road(4 Nos.), Sewree(3 Nos.), Parel(3 Nos.), Dharavi(2 Nos.), Wadala (2 Nos.), Kingsway(3 Nos.), Mahim(2 Nos.), Prabhadevi(3 Nos.), KEM Hospital (1 No.), Worli (2 Nos.), Mahalaxmi (3 Nos.) and Nair Hosp. RSS (1 No.) (Total Qty- 29 Nos.) • Replacement/Installation of Capacitors at Cumballa Hill RSS, Kingsway RSS, Wadala RSS, Worli Dairy RSS, Sitaladevi RSS (1 No. Each) and Sewree (2 Nos.) (Total Qty- 7 Nos.) • Replacement/Installation of Reactors at Masjid RSS, Hutatma Chowk RSS, Grant Road RSS,, Cumballa Hill RSS, Kingsway RSS, Kussara RSS, Mahalaxmi RSS (1 No.Each) and Sewree (2 Nos.) (Total Qty- 9 Nos.)

	• Replacement of Battery and Charger at Grant Road, Nariman Point, Ballard Estate, Colaba, Hutatma Chowk, MAZGAON Dock , Dharavi and Apollo RSS (Qty-8) • Replacement of Fire Fighting System at Love Grove and Naval Dock RSS (Water Mist Type, Qty.: 2 Nos.) • Replacement of Fire Fighting System at Sitladevi RSS, Sion Fort RSS, Hutatma Chowk RSS, Mahim Causeway RSS, Byculla RSS, Sewree RSS, Khetwadi RSS (CO 2 Type, , Qty.: 7 Nos.)
Actual completed work	**FY2019-20:** 1) Install. of earthing, 11 kV & 33 kV Sw/Gr. at Nepean Sea RSS. 2) Install. of earthing & T/F at Grant Road RSS 3) 33 kV RMU Replacement of at Avighna RSS. 4) Repal. of 33 kV Sw/Gr. at Sion Fort and Mazgaon Dock RSS. 5) Repla. of 11 kV B.S. at Parel and Sewree RSS 6) Repla. of Battery and Charger at Mazgaon Dock and Hutatma Chowk RSS 7) AFF System at Naval Dock RSS. 8) 33 kV cable laying at Nepean Sea RSS. **FY2020-21:** 1) Cable laying, Installation of earthing, 11 kV & 33 kV Sw/Gr and T/F at Nepean Sea RSS. 2) Civil work at Grant Road RSS 3)Installation of RMU at Avighna RSS. 4) Inst. Of 1i kV Sw.Gr at Sewree & Parel RSS. 5) Earthing at Kingsway, Parel & Mahalaxmi RSS. 6) FF at Hutatama Chowk & Khetwadi RSS. 7)Replacement of Battery and Charger at Nariman Point Ballard Estate, Colaba & Mazgaon Dock RSS **FY2021-22:** 1) Earthing ,Civil work and Inst. Of 33 kV Sw/Gr. , T/F & FF at Nepean Sea RSS. 2) Earthing at Grant Rd. Avighna, Mahalaxmi & Kingsway RSS. 3) Repl. Of 11 kV Sw/Gr. at Parel RSS. 4) Battery & Charger at Ballard Estate. **FY2022-23:** 1) Installation of addnl. T/F, 11 kV sw.gr. AFF & Earthing at Kingsway RSS. 2) Earthing at Nepean Sea , Colaba RSS 3) Battery &/battery charger at Nariman Point RSS. 4) Installation of 11 kV Sw.Gr at Prabhadevi & Kingsway RSS. 5) Installation of AFF at Byculla , Kingsway, Hutatma Chowk RSS 6) Cable diversion of Nepensea RSS. **FY2023-24:** 1) Installation of earthing & Install. Of 11 kV Sw/Gr. At Kingsway RSS..

Pending Work if any	• 33 kV switchgear replacement at Colaba(1 No.), Kingsway (2 Nos.), Mahim(2 Nos.), Dharavi(3 Nos.) (Total Qty- 8 Nos.) • 11 kV switchgear replacement at Grant Road (4 Nos.), Sewree (2 Nos.), Dharavi (2 Nos.), Wadala(2 Nos.), Mahim(2 Nos.), Prabhadevi (2 Nos.), KEM (1 No.), Worli (2 Nos.), Mahalaxmi (3 No.), Nair Hosp.(1 No.). (Total Qty- 21 Nos.) • Installation of Capacitors at Cumballa Hill, Kingsway, Wadala, Worli Dairy, Sitaldevi (1 each) and Sewree RSS (2 Nos.) (Total Qty- 7 Nos.) • Installation of Reactor at Masjid RSS, Hutatma Chowk RSS, Grant Road RSS,, Cumballa Hill RSS, Kingsway RSS, Kussara RSS, Mahalaxmi RSS (1 No.Each) and Sewree (2 Nos.) (Total Qty- 9 Nos.) • Replacement of Battery and Charger at Grant Road, Dharavi and Apollo RSS. • Replacement of Fire Fighting System at Love Grove RSS (Water Mist Type, Qty.: 1 Nos.) • Replacement of Fire Fighting System at Sitladevi RSS, Sion Fort RSS, Mahim Causeway RSS, Sewree RSS (CO 2 Type, Qty.: 5 Nos.)
Reason for delay if any	----
Reason for cost overrun if any	----

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.40.60 Crore	Rs. 30.18 Crore

Extent to which scope and objective were achieved:

i. Major scope of the work included in this DPR is completed in all respect.

ii. 33 kV switchgear replacement at Colaba (1 No.), Kingsway (2 Nos.), Mahim (2 Nos.), Dharavi (3 Nos.) (Total Qty- 8 Nos.) is already included in RDSS DPR, hence the said work may be considered as deleted from this DPR.

iii. 11 kV switchgear replacement at Grant Road (4 Nos.), Sewree (2 Nos.), Dharavi (2 Nos.), Wadala (2 Nos.), Mahim(2 Nos.), Prabhadevi (2 Nos.), KEM (1 No.), Worli (2 Nos.), Mahalaxmi (3 No.), Nair Hosp.(1 No.). (Total Qty- 21 Nos.) is already included in RDSS DPR, hence the said work may be considered as deleted from this DPR.

iv. Balance scope of work i.e. Battery & Battery charger & replacement of AFF System is to be included in the new DPR .

v. Due to execution of this DPR, reliability and quality of supply is improved

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The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080
Email ID : depro@bestundertaking.com

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

ESO/CEPL/Adm9(B)/MERC/196 /2024

DATE : 16 DEC 2024

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report for DPR Scheme 'Revamping of Existing Receiving Substations' Capital Investment Scheme for FY 2020-21 to 2022-23) (BEST Reference No. BEST/FY21/02).

Ref: MERC/CAPEX /2022-23/0556 dated 14th November, 2022.

Dear Sir / Madam,

This has reference to the Capital Scheme MERC Reference No. MERC/CAPEX /2022-23/0556 dated 14th November, 2022 (BEST Reference No. BEST/FY21/02) for "Revamping Existing Receiving Substations" for FY 2020-21 to 2022-23. The Hon'ble Commission has accorded in-principle approval for subject DPR with Costing of Rs.56.07 Cr. This scheme is to be closed as the scope of work under approved DPR is almost completed and balance if any work [illegible] included in new DPR. Also, this DPR is old one; therefore, we are submitting the Scheme Closure Report of the Scheme as *Appendix* to this submission.

Yours faithfully,

DCE REVIEW COMMITTEE-I BEST

(S.S.Adlinge)
Dy.Chief Engineer (RC-1)

OFFICE OF THE
MAHARASHTRA ELECTRICITY
REGULATORY COMMISSION
WTC. CUFFE PARADE, MUMBAI - 400 005.

Appendix-A

PROJECT COMPLETION REPORT

Name of the Scheme	'Revamping Existing Receiving Substations' (2019-20 to 2022-23)
BEST Scheme Code	BEST/FY21/02
MERC Reference No.	MERC/CAPEX /2022-23/0556 dated 14th November, 2022.
Objective of the Scheme (As per DPR)	To meet increasing load in area of supply and to improve quality and reliability of supply

Scheduled / Actual completion dates:

Scheduled date of starting	1st April 2019
Actual date of starting	1st April 2019
Scheduled date of completion	31st March 2023
Actual date of completion	31 March 2024
Scope of Work (As per DPR)	• Replacement of 10/12.5 MVA Transformer at Sitladevi RSS and Byculla RSS Tr. No. 1&3. (Total Qty- 3 Nos.) • Replacement of 33 kV, 1500 MVA, switchgears at Mahim Causeway RSS (Total Qty- 3 Nos.) • Diversion of 33 kV feeder cables of RSS viz. Wadala RSS (T/F. No. 1&3), Kingsway RSS (T/F. No. 2), Raoli Hill RSS (T/F. No. 2), Sion Fort RSS (T/F. No. 2), Pratiksha Nagar RSS (T/F. No. 1), Lodha Crown T6 RSS (T/F. No. 1) from TPC Dharavi to TPC Antop Hill and laying of additional cables for proposed Pratiksha Nagar RSS (T/F. No. 2), Lodha Crown T6 RSS (T/F. No. 2), Lodha Crown T10 RSS (T/F. No. 1&2) and New RSS commissioning at Dosti Acres (Total Qty.: 16.961 Kms..) • Replacement of 33 kV cable from TPC Parel to Marathon Futurex along with additional cables. (Total Qty.: 5.722 Kms.) • Replacement and Diversion of 33 kV cable part portion of Cumballa Hill RSS (T/F. 1,2 & 4) and laying additional one 33 kV cable for Apollo Mill RSS(T/F. 2) (Total Qty.: 7.761 Kms.) • Diversion & Replacement of EHV cables of Sitladevi RSS (T/F. 1,2,3 &4), VSNL HV Consumer from T.H. Kataria Marg ROB below Western Railway Tracks (Total Qty.: 2.210 Kms., Includes HDD Cost) • Diversion & Replacement of EHV cables of part portion of 33 kV feeder DBA1→ Futurex 33 kV HT Room LHS & DBA 2→ Futurex 33 kV HT Room RHS below Western Railway Tracks (Delisle ROB) (Total Qty.: 3.420 Kms., Includes HDD Cost)

Actual completed work	**FY2019-20**: 1) Installation of earthing at Byculla & Mahim Causeway RSS. 2) 33 kV cable laid at Antop Hill. **FY2020-21**: Earthing & laying of 33 kV cable at Byculla RSS 2) 33 kV cable diversion at Antop Hill. **FY2021-22**: 1) Installation of earthing & T/F at Byculla RSS. 2) 33 kV cable diversions at Antop Repl. Hill. 3) Replacement of 33 kV switchgears at Mahim Causeway RSS. **FY2022-23:** 1) Diversion & Replacement 33 kV cable for DBA ---> Marathon Futurex 2) 33 kv Cable diversion for Raoli Hill, Lodha Crown , Sion Fort, Pratiksha Nagar RSS. 3) Cable diversion at T.H.Kataria Marg and Chinchpokli Rly. Station. **FY2023-24:** 1) Cable laying at Kataria Bridge.
Pending Work if any	• Replacement of Transformer at Sitaladevi RSS (1 No.) • Replacement and Diversion of 33 kV cable part portion of Cumballa Hill RSS (T/F. 1,2 & 4) and laying additional one 33 kV cable for Apollo Mill RSS(T/F. 2) (Total Qty.: 7.761 Kms.) • Diversion & Replacement of EHV cables of Sitaladevi RSS (T/F. 1,2,3 &4), VSNL HV Consumer from T.H. Kataria Marg ROB below Western Railway Tracks (Total Qty.: 2.210 Kms., Includes HDD Cost)
Reason for delay if any	----
Reason for cost overrun if any	----

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.56.07 Crore	Rs. 27.36 Crore

Extent to which scope and objective were achieved:

i. Replacement of Transformer at Sitaladevi RSS and cable laying schemes for Cumballa Hill, Stialdevi (Tr. 1,2,3 & 4) & VSNL is included in the RDSS DPR hence, the said scope of work may be deleted from this DPR.

ii. As per estimated cost, major capital expenditure is required to be made on Cable laying and RI Charges. Now, the same work is included in RDSS. Hence, there is lower capitalisation (Rs.27.36 Cr) as against approved capitalisation (Rs. 56.07 Cr).

iii. Due to execution of this DPR, reliability and quality of supply is improved

---

0/c

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

TELEPHONE : (022) 22856262
FAX : (022) : 22851244
TELEX : 1185755 BEST IN
TELEGRAM : BEST, MUMBAI-400 001.

BEST BHAVAN,
BEST MARG,
POST BOX NO. 192
MUMBAI - 400 001.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

OUR REF. : ESO/CEPL/Adm9(B)/SCADA/DPR/ 63 /2022

DATE : 11.11.2022

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report for DPR Scheme 'Supervisory Control & Data Acquisition (SCADA)'. BEST Code No.BEST/FY18/08A.

Ref: DPR approved by the Hon'ble Commission vide Letter reference No. MERC/CAPEX/2017-18/4759 dated 22 November 2017.

Dear Sir / Madam,

This has reference to the Capital Investment Scheme No. BEST/FY18/08A for "Supervisory Control & Data Acquisition (SCADA) for FY 2017-18 to FY2020-21". The Hon'ble Commission had accorded in-principle approval for subject DPR (with Scheme MERC approved value Rs. 13.12 Crore) on 22 November 2017. This scheme is old one and the scope of work of this DPR will be included in the RDSS DPR. Therefore, there are NIL chances to complete the work. We are submitting the Scheme Closure Report of the Scheme as *Appendix* to this submission.

The Hon'ble commission is kindly requested to consider the attached scheme closure report.

Mrathe 14/11/2022

OFFICE OF THE
MAHARASHTRA ELECTRICITY
REGULATORY COMMISSION
WTC, CUFFE PARADE, MUMBAI - 400 005.

Yours faithfully,

(V. M. Kamat)
Chief Engineer (Planning)

Cc: CEPL / DCESL- for information.
DETE: For necessary action.

"BEST Travel Saves Fuel"

PROJECT COMPLETION REPORT

Name of the Scheme	"Scheme 'Supervisory Control & DataAcquisition (SCADA)" Phasing period (FY2017-18 up to FY2020-21)
BEST Scheme Code	BEST/FY18/08A
MERC Code No.	MERC/CAPEX/2017-18/4759dated 22November 2022
Objective of the Scheme (As per DPR)	• Prompt restoration of Electric supply. • Good communication system for SCADA which will reduce revenue loss & assure consumers satisfaction. • To adhere Standards of Performance (SoP) guidelines. • To enhance the safety of the operating personnel during operations for load transfer & outage / maintenance arrangement of electrical equipment's of RSS.

Scheduled / Actual completion dates:

Schedule date of starting	1st April 2017 (FY 2017-18)
Actual date of starting	-
Scheduled date of completion	31st March 2021. (FY2020-21)
Actual date of completion	-
Scope of Work (As per DPR)	A) SCADA System for Central South zone. B) SCADA System for 110 kV Backbay RSS & C) SCADA System for 110 kV DBA RSS
Actual completed work	**NIL**
Pending Work if any	1) SCADA System for Central South zone. 2) SCADA System for 110 kV Backbay RSS 3) SCADA System for 110 kV DBA RSS
Reasons for Delay	1. For implementation of SCADA system for new and existing RSS was delayed due to preparation of RFP and tendering process. Further, tender was invited but same was not materialized due to NIL response. 2. In the mean time BEST had formed a special study team to combine various automation projects. Accordingly, proposal was prepared by combining requirement of zones SCADA, DMS, OMS and put up for management approval. However, due higher cost, the same proposal was kept on hold by management. 3. Afterwards, it was decided to invite tender only for Backbay RSS SCADA and accordingly, tendering process was initiated. In the mean time the Revamped Distribution Sector Scheme (RDSS) was launched by MoP, Government of India. Therefore, BEST management has decided to execute the SCADA project under RDSS. Because of which this DPR is closed.

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.13.12 Crore	-
Reason for variation of if any : NIL		

Extent to which scope and objective were achieved: NIL

0/

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080

Email ID: depro@bestundertaking.com

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

ESO/CEPL/Adm-9(B)/MERC/ 192 /2024

DATE : 16 DEC 2024

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

16/12/2024
OFFICE OF THE
MAHARASHTRA ELECTRICITY
WTC, CUFFE PARADE, MUMBAI - 400 005.

Sub: Scheme Closure Report for DPR Scheme for 'Digitization System' (BEST Code No.BEST/FY18/08B).

Ref: MERC/CAPEX/2017-18/4886 dated 13.12.2017.

Dear Sir / Madam,

This has reference to the Capital Investment Scheme for 'Digitisation System' (BEST Code No.BEST/FY18/08B), the Hon'ble Commission had accorded in principle approval for subject DPR (Scheme MERC approved value Rs. 9.22 Cr) vide above referred MERC letter on 13th December 2017. This scheme is to be closed as the scope of work for GIS Software under this approved DPR is completed with the help of MCGM. We are submitting the Scheme Closure Report of the subject Scheme as *Appendix* to this submission.

The Hon'ble commission is kindly requested to consider the attached scheme closure report.

Yours faithfully,

DCE REVIEW COMMITTEE BEST

16/12/2024

(S.S.Adlinge)
Dy.Chief Engineer (RC-1)

SPR 04

Cc: CEPL / DCEW: - For information.
DECO: For necessary action.
DETE: For information and Necessary Action.

Appendix

PROJECT COMPLETION REPORT

Name of the Scheme	'Digitisation System
BEST Scheme Code	BEST/FY18/08B
MERC Code No.	MERC/CAPEX/2011-18/4886 dated13.12.2017
Objective of the Scheme (As per DPR)	To provide improved service to consumers and to Atomize Outage Management System.

Scheduled / Actual completion dates:

Scheduled date of Starting	1st April 2017 (FY 2017-18)
Actual date of Starting	1st April 2017
Scheduled date of completion	31st March 2020
Actual date of completion	31st March 2024
Scope of Work (As per DPR)	• Augmentation / Up-gradation Digitisatioin System. • To undertake integration of CM, CRM, SCADA &Digitisation system to bring them on common GIS Platform.
Actual completed work	FY2017-18: NIL FY2018-19 & FY2019-20: Purchase of hardware. FY 2020-21, FY 2022-23 & FY 2023-24 :NIL
Pending Schemes / Work if any	NIL
Reason for delay and Non execution of the project	Initially it was decided to execute the "Digitisation System" Project by BEST itself. Therefore, this DPR was submitted and approved by MERC. However, in the mean time MCGM has informed to BEST that to bring BEST and MCGM on same platform, GIS Software is required to be used. MCGM is using GIS software of M/s. ESRI and they have deputed their staff for execution of this project in BEST. Please note that the total expenditure towards this project will be borne by MCGM. Therefore, there is No any further expenditure on this project.
Reason for cost overrun if any	NA

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.9.22 Crore	Rs.0.45 Crore

Extent to which scope and objective were achieved:

1. Except Integration of SCADA &DA, all other work related to GIS included in the DPR is completed in all respect. The work will be done by the staff allotted by MCGM.

2. Due to execution of this DPR, there is faster restoration of supply, asset mapping is also done.

O/c

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080

Email ID : depro@bestundertaking.com

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

ESO/CEPL/Adm9(B)/MERC/ 193 /2024

DATE : 16 DEC 2024

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report for DPR Scheme 'Revamping of Existing Receiving Substations' (BEST Code No.IPDS/BEST/FY15-16/01).

Ref: DPR approved by the Hon'ble Commission vide Letter reference No. MERC/CAPEX/DPR/2019-20/418 dated 26.07.2019.

Dear Sir / Madam,

This has reference to the Capital Investment Scheme (BEST Code No. IPDS/BEST/FY15-16/01) for "Strengthening of electrical Network (Receiving Substation, Dist. Substation & Cable Related Work). The Hon'ble Commission had accorded in principle approval for subject DPR (Scheme MERC approved value Rs. 118.09 Crore) vide above referred MERC letter on 26th July 2019. This scheme is to be closed as the scope of work under this approved DPR is completed. We are submitting the Scheme Closure Report of the subject Scheme as *Appendix* to this submission.

The Hon'ble commission is kindly requested to consider the attached scheme closure report.

Yours faithfully,

16/12/2024

(S.S.Adlinge)
Dy.Chief Engineer (RC-1)

DCE REVIEW COMMITTEE-I BEST

DPRAG

16/12/2024

Cc: CEPL / DCEW: For information.
DECO: For necessary action.

OFFICE OF THE MAHARASHTRA ELECTRICITY REGULATORY COMMISSION WTC, CUFFE PARADE, MUMBAI 400 005.

Appendix

PROJECT COMPLETION REPORT

Name of the Scheme	"Strengthening of electrical Network (Receiving Substation, Dist. Substation & Cable Related Work).
BEST Scheme Code	IPDS/BEST/FY15-16/01
MERC Code No.	MERC/CAPEX/DPR/2019-20/418 dated 26.07.2019.
Objective of the Scheme (As per DPR)	To meet increasing load in area of supply and to improve quality and reliability of supply.

Scheduled / Actual completion dates:

Scheduled date of Starting	1st April 2018
Actual date of Starting	1st April 2018
Scheduled date of completion	31st March 2020
Actual date of completion	31st March, 2021.
Scope of Work (As per DPR)	• Commissioning of New RSS: Pratiksha Nagar & Wankhede • Installation of additional T/F at PMGP 501 RSS. (Qty.; 1No.) • Replacement of 22KV, 10 MVA T/F by 33 KV, 16 MVA T/F. (Qty.; 12 Nos.) • Replacement of 33 kV Primary Switchgears (Qty.; 7 Nos.) • Replacement of 11 kV, switchgears & accessories (Qty.; 5 Nos.) • Commissioning of New DSS (Qty.; 12 Nos.) • Installation of additional D/T's (Qty.; 3Nos.) • Replacement of D/T's . (Qty.; 6 Nos.) • Replacement/ Laying of 33 kV cables (Qty.; 24.972 Km.) • Replacement/Laying of 11 kV cables (Qty.; 10.596 Km.) • Installation of Earth Fault Passage Indicator (EFPI) (Qty.; 2250 Nos.)
Actual completed work	**FY2018-19**: 1) Installation/ Replacement of 22/11 kV 10 MVA T/F by 33/11 kV T/F at Love Grove, Pratiksha Nagar, Cumballa Hill & Nestle RSS. 2) Replacement/ Laying of 33 kV & 11 kV cables. (Capitalization – 24.27 Cr.). **FY2019-20**: 1) Installation/ Replacement of Transformer at Cumballa Hill, Nestle, Love Grove, Worli, Worli Dairy, Sitaladevi, Wankhede, PMGP & Prabhadevi RSS. 2) Replacement of 33 kV & 11 kV switchgears at PMGP, Pratiksha Nagar, Wankhede, Masjid & Mumbai Central RSS. 3) Installation of 33 kV Sw/Gr at Mumbadevi & Kingsway RSS. 4) 33 kV Cable laying at Prabhadevi & Worli RSS up to Tata Mahalaxmi RS. 5) Commissioning of New DSS (5 Nos.). 6) Installation/ Replacement of DT's (4 Nos.). • Installation of Earth Fault Passage Indicator in FY 2018-19, FY 2019-20 & FY 2020-21 (EFPI -2250 Nos.) (Capitalization – 67.42 Cr).

	FY 2020-21: 1) Replacement of Transformer at Cumballa Hill, Pratiksha Nagar, Nestle, Love Grove, Sitaladevi, & Prabhadevi RSS. 2) 33 kV Cable laying from TPC Dharavi to Sitaladevi RSS 3) Commissioning of New DSS (7 Nos.). 4) Installation/ Replacement of DT's (5 nos.). (Capitalisation – 10.66 Cr).
Pending Schemes / Work if any	(i) TPC Carnac RS (Carnac Bridge) to Esplanade RSS Tr. No. 1, 2 & 3, ii) TPC Carnac RS (M A Road) to Girgaon RSS Tr. No. 1 (up to princes street) and iii) TPC Carnac RS (Carnac Bridge) to Malbar Hill RSS Tr. No. 2 (up to princess Street) Partly 33 kV cable laying work is pending due to time limit of the project. Partly 11 kV cable laying work is also pending due to time limit of the scheme.
Reason for delay if any	As per schedule, the work included in this DPR is required to be completed before March 2020. The delay is due to delivery of material and Covid-19.
Reason for cost overrun if any	NA

Expenditure details:

	Expenditure as per DPR	Actual Expenditure
Project Cost	Rs.118.09 Crore	Rs.102.35 Crore

Extent to which scope and objective were achieved:

1. About 86% work included in the DPR is completed in all respect. Balance work is pending due to time limit of the IPDS Scheme.

2. Due to execution of this DPR, reliability and quality of supply is improved.

SPRD4

o/c

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

PROJECT DEPARTMENT

TELEPHONE : (022) 22822080

Email ID : depro@bestundertaking.com

2nd Floor,
Backbay Veej Bhavan,
149/150, Gen. J. Bhosale Marg,
Nariman Point,
Mumbai - 400 021.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

PR/CEPL/Adm9(B)/MERC(IPDS)/ 35/2021

DATE : 07 JUN 2021

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1, World Trade Centre,
Cuffe Parade, Colaba 400 005

Sub: Scheme Closure Report of IPDS DPR Scheme '**Energy Meter**' Scheme No. BEST/FY2015-16/01.

Ref: MERC Approval No. MERC/CAPEX/2019-20/116 Dated 18th April, 2019.

Dear Sir / Madam,

This has reference to the IPDS Capital investment Scheme No. BEST/FY2015-16/01 for "Energy Meter". The Hon'ble Commission has accorded in-principle approval for subject DPR with Capital Scheme MERC approved value Rs. 12.94 Crore on 18th April, 2019. This scheme is to be closed as the scope of work under approved DPR is completed. We are submitting herewith the Scheme Closure Report of the Scheme as *Appendix* to this submission.

We trust the same is in order.

Yours faithfully,

Makwana

(S. P. Makwana)
Chief Engineer (Planning)

AE(PP)
7/6

Ram

... PARADE, MUMBAI - 400 005.

Appendix

PROJECT COMPLETION REPORT

Name of the Scheme	'Energy Meter'FY2018-19 and FY2019-20
Scheme Code	BEST/FY2015-16/01
MERC Code No.	MERC/CAPEX/2019-20/116 dated 18thApril,, 2019.
Objective of the Scheme (As per DPR)	To replace 2 Lakh conventional meters with Electronic meters for accurate measurement of energy. To provide improvedservice to consumers.

Scheduled / Actual completion dates:

Scheduled date of completion	FY2018-19 & FY2019-20
Actual date of completion	FY2018-19 and FY2019-20
Scope of Work (As per DPR)	**For Scope of work**: Replacement of 2 Lakh Nos. of electro-mechanical(conventional)meters by Electronic meters
Actual completed work	**FY18-19**:During financial year, total 81,999 Nos. of electro-mechanical (conventional) meters were replaced by Electronic meters. **FY19-20**: During financial year, total 1,18,001 Nos. of electro-mechanical (conventional) meters were replaced by Electronic meters.
Pending Work if any	NA
Reason for cost overrun if any	Not Applicable (NA)

Expenditure details:

	Approved Cost (in RS Crs.)	Actual Cost (in RS Crs.)
Capital Expenditure	FY 2018-19-5.49 FY 2019-20- 7.45 Total =12.94	FY 2018-19- 5.49 FY 2019-20- 7.41 **Total =12.90**
Capitalisation	FY 2018-19- 5.49 FY 2019-20- 7.45 **Total =12.94**	FY 2018-19- 5.49 FY 2019-20- 7.41 **Total =12.90**

Extent to which scope and objective were achieved:

i. 2 Lakh Nos. of electro-mechanical meters are replaced with Electronic meters.

ii. All objective of the scheme is achieved.

0/

The Brihan Mumbai Electric Supply & Transport Undertaking

(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

TELEPHONE : (022) 22856262
FAX : (022) : 22851244
TELEX : 1185755 BEST IN
TELEGRAM : BEST, MUMBAI-400 001.

BEST BHAVAN,
BEST MARG,
POST BOX NO. 192
MUMBAI - 400 001.

ADDRESS ALL COMMUNICATION BY TITLE NOT BY NAME

OUR REF. :

DATE : 2 6 APR 2024

PR/CEPL/Adm9(B)/MERC/2024-25/ 42 /2024

To,

The Secretary,
Maharashtra Electricity Regulatory Commission
13th Floor, Centre No.1,
World Trade Centre,
Cuffe Parade, Colaba
Mumbai - 400 005.

Dear Sir / Madam,

Sub: Scheme Closure Report for DPR Scheme 'Energy Meter' (BEST Scheme No. BEST/FY19/06).

Ref: Commission's reference No. MERC/CAPEX/2019-20/1110 Dated 28.11.2019.

This has reference to the Capital Scheme No. BEST/FY19/06 for "Energy Meter". The Hon'ble Commission has accorded in-principle approval for subject DPR with Capital Scheme MERC approved value Rs. 30.19 Crore on 28November, 2019. This scheme is to be closed as the scope of work under approved DPR is completed. We are submitting the Scheme Closure Report of the Scheme as *Appendix* to this submission.

Yours faithfully,

(S. P. Makwana)
Chief Engineer (Planning)

msalke 26/4/2024
OFFICE OF THE
MAHARASHTRA ELECTRICITY
REGULATORY COMMISSION
WTC, CUFFE PARADE, MUMBAI - 400 005.

Appendix

PROJECT COMPLETION REPORT

Name of the Scheme	'Energy Meter'FY2018-19, FY2019-20& FY2020-21
Scheme Code	BEST/FY19/06
MERC Code No.	MERC/CAPEX/2019-20/1110 dated 28.11.2019.
Objective of the Scheme (As per DPR)	Reduction in loss, for accurate measurement of energy,to provide improvedservice to the consumers, to release new supply, to replace conventional/electromechanical meters, to replace defective meters on site.

Scheduled / Actual completion dates:

Scheduled date of completion	FY2018-19, FY2019-20& FY2020-21
Actual date of completion	FY2018-19, FY2019-20 & FY2020-21
Scope of Work (As per DPR)	For Scope of work refer Annexure-A.
Actual completed work	**FY18-19**: Meter installed for new connections: Single Phase-24606Nos, Poly Phase-8807Nos.Net Single Phase -9 Nos, Net Poly Phase-80 Nos. (Total Qty-33,502Nos.) Meter Replaced: Single Phase -29,366Nos, Poly Phase -16,123Nos. (Total Qty-45,489 Nos.) CTs: 599Nos. Meter Seals- 2,13,389Nos. **FY2019-20**: Meter installed for new connections: Single Phase -19,695 Nos, Poly Phase-7,714 Nos. Net Single Phase -2 Nos, Net Poly Phase-83Nos. (Total Qty-27,494Nos.) Meter Replaced: Single Phase -33,872 Nos, Poly Phase -13,044 Nos. (Total Qty-46, 916 Nos.) CTs: 298Nos. Meter Seals-3,58,942Nos. **FY2020-21**: Meter installed for new connections: Single Phase -10,914Nos, Poly Phase-4,329Nos. Net Poly Phase-39 Nos. (Total Qty-15,282Nos.) Meter Replaced: Single Phase -29,850 Nos, Poly Phase -30,940Nos. (Total Qty-60,790Nos) CTs: 546Nos. Meter Seals-1,16,431 Nos.
Pending Work if any	-
Reason for cost overrun if any	NIL.
Reason for Time overrun if any	NIL

Expenditure details:

Total Approved Project Cost	Financial Year	Approved Phasing		Actual Capital Expenditure & Capitalisation	
		CAPEX	Capitalisation	CAPEX	Capitalisation
30.19 Cr	2018-19	**8.60**	**8.60**	**6.79**	**6.79**
	2019-20	**8.34**	**8.34**	**10.52**	**10.52**
	2020-21	**13.25**	**13.25**	**11.95**	**11.95**
30.19 Cr	**TOTAL**	**30.19**	**30.19**	**29.26**	**29.26**

Extent to which scope and objective were achieved: All objective of the scheme is achieved.

--

DEPRECIATION FOR THE YEAR 2013-14

LAND

YEAR	BOOK VALUE AS ON 31.03.2013	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.13	RATE OF DEP.	DEP. PROVISION FOR YEAR 2013-14	CUMM.DEP. PROVIDED UPTO 2012-13	CUMM. DEP. PROVIDED UPTO 2013-14	REMARK
1	7	8	9	10	11	13	14	15	16	17	
				(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
TOTAL :	0	0	0	0	0	0		0	0	0	

DEPRECIATION FOR THE YEAR 2022-23

BUILDING

MERC ORDER : LIFE 27 YEARS
FROM : 2011-12
RATE OF DEP : 3.34%

LIFE : 45 YEARS
RATE OF DEP : 2%

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1946	3581944	0	3581944	0	3581944	2%	0	3223750	3223750	90
1947	141019	0	141019	0	141019	2%	0	126917	126917	90
1948	14407	0	14407	0	14407	2%	0	12966	12966	90
1949	71813	0	71813	0	71813	2%	0	64632	64632	90
1950	197567	0	197567	0	197567	2%	0	177810	177810	90
1951	340880	0	340880	0	340880	2%	0	306792	306792	90
1952	815879	0	815879	0	815879	2%	0	734291	734291	90
1953	481538	0	481538	0	481538	2%	0	433384	433384	90
1954	95470	0	95470	0	95470	2%	0	85923	85923	90
1955	217964	0	217964	0	217964	2%	0	196168	196168	90
1956	1543151	0	1543151	0	1543151	2%	0	1388836	1388836	90
1957	1525611	0	1525611	0	1525611	2%	0	1373050	1373050	90
1958	497308	0	497308	0	497308	2%	0	447577	447577	90
1959	1226363	0	1226363	0	1226363	2%	0	1103727	1103727	90
1960	1113878	0	1113878	0	1113878	2%	0	1002490	1002490	90
1961	1880151	0	1880151	0	1880151	2%	0	1692136	1692136	90
1962	2776044	0	2776044	0	2776044	2%	0	2498440	2498440	90
1963	1356809	0	1356809	0	1356809	2%	0	1221128	1221128	90
1964	826541	0	826541	0	826541	2%	0	743887	743887	90
1965	255812	0	255812	0	255812	2%	0	230231	230231	90
1966	301079	0	301079	0	301079	2%	0	270971	270971	90
1967	1079310	0	1079310	0	1079310	2%	0	971379	971379	90
1968	400485	0	400485	0	400485	2%	0	360437	360437	90
1969	1397125	0	1397125	0	1397125	2%	0	1257413	1257413	90
1970	697402	0	697402	0	697402	2%	0	624224	624224	90
1971	1686597	0	1686597	0	1686597	2%	0	1517937	1517937	90
1972	2339512	0	2339512	0	2339512	2%	0	2105561	2105561	90
1973	2411311	0	2411311	0	2411311	2%	0	2170180	2170180	90
1974	1145455	0	1145455	0	1145455	2%	0	1030910	1030910	90
1975	1178382	0	1178382	0	1178382	2%	0	1060544	1060544	90
1976	500185	0	500185	0	500185	2%	0	450167	450167	90
1977	7157914	0	7157914	0	7157914	3.34%	0	6442123	6442123	90
1978	6883580	0	6883580	0	6883580	3.34%	0	6195222	6195222	90
1979	368085	0	368085	0	368085	3.34%	0	331276	331276	90
1980	781042	0	781042	0	781042	3.34%	0	702937	702937	90
1981	364429	0	364429	0	364429	3.34%	0	327986	327986	90
1982	-227602	0	-227602	0	-227602	3.34%	0	-204842	-204842	90
1983	1121912	0	1121912	0	1121912	3.34%	0	1009721	1009721	90
1984	2964297	0	2964297	0	2964297	3.34%	17785	2650082	2667867	90
1985	9314721	0	9314721	0	9314721	3.34%	242183	8141066	8383249	90
1986	4606890	0	4606890	0	4606890	3.34%	153870	3934284	4088154	89
1987	9708667	0	9708667	0	9708667	3.34%	324269	8097028	8421298	87
1988	20411846	0	20411846	0	20411846	3.34%	681756	16615243	17296998	85
1989	10603374	0	10603374	0	10603374	3.34%	354153	8419079	8773232	83
1990	6365514	0	6365514	0	6365514	3.34%	212608	4926908	5139516	81
1991	22484854	0	22484854	0	22484854	3.34%	750994	16953580	17704574	79
1992	24204055	0	24204055	0	24204055	3.34%	808415	17765776	18574192	77
1993	77298026	0	77298026	0	77298026	3.34%	2581754	55190791	57772545	75
1994	110032650	0	110032650	0	110032650	3.34%	3675091	76362659	80037750	73
1995	20021983	0	20021983	0	20021983	3.34%	668734	13494817	14163551	71
1996	23416339	0	23416339	0	23416339	3.34%	782106	15314286	16096391	69
1997	90149592	0	90149592	0	90149592	3.34%	3010996	57154841	60165838	67
1998	113651012	0	113651012	0	113651012	3.34%	3795944	69781721	73577665	65
1999	106754679	0	106754679	0	106754679	3.34%	3565606	63412279	66977886	63
2000	44283153	0	44283153	0	44283153	3.34%	1479057	25418530	26897587	61
2001	19939515	0	19939515	0	19939515	3.34%	665980	11046491	11712471	59
2002	2066618	0	2066618	0	2066618	3.34%	69025	1103574	1172599	57
2003	462208	0	462208	0	462208	3.34%	15438	237575	253013	55
2004	392398	0	392398	0	392398	3.34%	13106	193845	206951	53
2005	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2006	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2007	453488	0	453488	0	453488	3.34%	15146	196814	211960	47
2008	125400	0	125400	0	125400	3.34%	4188	51916	56104	45
2009	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2010	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2011	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2012	31600	0	31600	0	31600	3.34%	1055	9499	10554	33
2013	3908429	0	3908429	0	3908429	3.34%	130542	1044332	1174874	30
2014	869861	0	869861	0	869861	3.34%	29053	203374	232427	27
2015	3597926	0	3597926	0	3597926	3.34%	120171	721024	841195	23
2016	2530202	0	2530202	0	2530202	3.34%	84509	422544	507052	20
2017	1660275	0	1660275	0	1660275	3.34%	55453	221813	277266	17
2018	180433	0	180433	0	180433	3.34%	6026	18079	24106	13
2019	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2020	3200000	0	3200000	0	3200000	3.34%	106880	106880	213760	7
2021	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
TOTAL :	784236357	0	784236357	0	784236357		24421895	522899008	547320903	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 17 YEARS

STATIC ROOM A.C.

FROM : 2011-2012 | LIFE : 15 YRS

RATE OF DEP : 5.28% | RATE OF DEP. : 6 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1978	14000	0	14000	0	14000	6%	0	12600	12600	90
1979	22502	0	22502	0	22502	6%	0	20252	20252	90
1980	0	0	0	0	0	6%	0	0	0	#DIV/0!
1981	0	0	0	0	0	6%	0	0	0	#DIV/0!
1982	474787	0	474787	0	474787	6%	0	427308	427308	90
1983	0	0	0	0	0	6%	0	0	0	#DIV/0!
1984	0	0	0	0	0	6%	0	0	0	#DIV/0!
1985	2491	0	2491	0	2491	6%	0	2242	2242	90
1986	170765	0	170765	0	170765	6%	0	153689	153689	90
1987	791175	0	791175	0	791175	6%	0	712058	712058	90
1988	497820	0	497820	0	497820	6%	0	448038	448038	90
1989	0	0	0	0	0	6%	0	0	0	#DIV/0!
1990	0	0	0	0	0	6%	0	0	0	#DIV/0!
1991	341014	0	341014	0	341014	6%	0	306913	306913	90
1992	132450	23309	109141	0	109141	6%	0	98227	98227	90
1993	-22953	0	-22953	0	-22953	6%	0	-20658	-20658	90
1994	0	0	0	0	0	6%	0	0	0	#DIV/0!
1995	0	0	0	0	0	6%	0	0	0	#DIV/0!
1996	0	0	0	0	0	6%	0	0	0	#DIV/0!
1997	0	0	0	0	0	6%	0	0	0	#DIV/0!
1998	0	0	0	0	0	6%	0	0	0	#DIV/0!
1999	0	0	0	0	0	6%	0	0	0	#DIV/0!
2000	0	0	0	0	0	6%	0	0	0	#DIV/0!
2001	0	0	0	0	0	6%	0	0	0	#DIV/0!
2002	0	0	0	0	0	6%	0	0	0	#DIV/0!
2003	0	0	0	0	0	6%	0	0	0	#DIV/0!
2004	0	0	0	0	0	6%	0	0	0	#DIV/0!
2005	0	0	0	0	0	6%	0	0	0	#DIV/0!
2006	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2007	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL:	2424051	23309	2400742	0	2400742		0	2160668	2160668	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER

MOTOR VEHICLES

FROM : 2011-12 LIFE : 8 YRS.

RATE OF DEP : 11.25% RATE OF DEP.: 11.25%

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1982	20597	0	20597	0	20597	11.25%	0	18537	18537	90
1983	294325	0	294325	0	294325	11.25%	0	264893	264893	90
1984	130037	0	130037	0	130037	11.25%	0	117033	117033	90
1985	90429	0	90429	0	90429	11.25%	0	81386	81386	90
1986	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
1987	251142	0	251142	0	251142	11.25%	0	226028	226028	90
1988	319831	0	319831	0	319831	11.25%	0	287848	287848	90
1989	169537	0	169537	0	169537	11.25%	0	152583	152583	90
1990	156408	0	156408	0	156408	11.25%	0	140767	140767	90
1991	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
1992	24215	0	24215	0	24215	11.25%	0	21794	21794	90
1993	5435922	0	5435922	0	5435922	11.25%	0	4892330	4892330	90
1994	136897	0	136897	0	136897	11.25%	0	123207	123207	90
1995	640296	0	640296	0	640296	11.25%	0	576266	576266	90
1996	460825	0	460825	0	460825	11.25%	0	414743	414743	90
1997	601437	0	601437	0	601437	11.25%	0	541293	541293	90
1998	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
1999	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2000	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2001	852668	0	852668	0	852668	11.25%	0	767401	767401	90
2002	6673427	0	6673427	0	6673427	11.25%	0	6006084	6006084	90
2003	4507074	0	4507074	0	4507074	11.25%	0	4056366	4056366	90
2004	925439	745730	179709	0	179709	11.25%	0	161738	161738	90
2005	2572613	0	2572613	0	2572613	11.25%	0	2315352	2315352	90
2006	877500	0	877500	0	877500	11.25%	0	789750	789750	90
2007	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2008	940806	0	940806	0	940806	11.25%	0	846725	846725	90
2009	3744089	0	3744089	0	3744089	11.25%	0	3369680	3369680	90
2010	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2011	2914684	0	2914684	0	2914684	11.25%	0	2623216	2623216	90
2012	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2013	805406	0	805406	0	805406	11.25%	0	724865	724865	90
2014	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2015	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2016	792162	0	792162	0	792162	11.25%	89118	445591	534709	68
2017	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2018	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2019	1599998	0	1599998	0	1599998	11.25%	180000	360000	539999	34
2020	3123816	0	3123816	0	3123816	11.25%	351429	351429	702859	23
2021	979780	0	979780	0	979780	11.25%	110225	0	110225	11
TOTAL :	40041359	745730	3.9E+07	0	39295630		730773	30676905	31407678	

DEPRECIATION FOR THE YEAR 2022-23

TOOLS & EQUIPMENTS

MERC ORDER : LIFE 17 YEARS

FROM : 2011-12 LIFE : 18 YRS.

RATE OF DEP :5.28% RATE OF DEP.: 5%

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDE D UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1970	1812	0	1812	0	1812	5%	0	1631	1631	90
1971	37644	0	37644	0	37644	5%	0	33880	33880	90
1972	50899	0	50899	0	50899	5%	0	45809	45809	90
1973	19494	0	19494	0	19494	5%	0	17545	17545	90
1974	41285	0	41285	0	41285	5%	0	37157	37157	90
1975	725	0	725	0	725	5%	0	653	653	90
1976	37637	0	37637	0	37637	5%	0	33873	33873	90
1977	40051	0	40051	0	40051	5%	0	36046	36046	90
1978	3025	0	3025	0	3025	5%	0	2723	2723	90
1979	84363	0	84363	0	84363	5%	0	75927	75927	90
1980	88844	0	88844	0	88844	5%	0	79960	79960	90
1981	16246	0	16246	0	16246	5%	0	14621	14621	90
1982	69785	0	69785	0	69785	5%	0	62807	62807	90
1983	2511	0	2511	0	2511	5%	0	2260	2260	90
1984	51446	0	51446	0	51446	5%	0	46301	46301	90
1985	1564682	0	1564682	0	1564682	5%	0	1408214	1408214	90
1986	27285	0	27285	0	27285	5%	0	24557	24557	90
1987	-2088831	0	-2088831	0	-2E+06	5%	0	-1879948	-1879948	90
1988	0	0	0	0	0	5%	0	0	0	#DIV/0!
1989	4301	0	4301	0	4301	5%	0	3871	3871	90
1990	37708	0	37708	0	37708	5%	0	33937	33937	90
1991	0	0	0	0	0	5%	0	0	0	#DIV/0!
1992	145011	0	145011	0	145011	5%	0	130510	130510	90
1993	101770	0	101770	0	101770	5%	0	91593	91593	90
1994	223554	0	223554	0	223554	5%	0	201199	201199	90
1995	0	0	0	0	0	5%	0	0	0	#DIV/0!
1996	0	0	0	0	0	5%	0	0	0	#DIV/0!
1997	0	0	0	0	0	5%	0	0	0	#DIV/0!
1998	183841	0	183841	0	183841	5%	0	165457	165457	90
1999	128198	0	128198	0	128198	5.28%	0	115378	115378	90
2000	51304	0	51304	0	51304	5.28%	0	46174	46174	90
2001	36504	0	36504	0	36504	5.28%	0	32854	32854	90
2002	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2003	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2004	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2005	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2006	295239	0	295239	0	295239	5.28%	15589	244458	260047	88
2007	15456	0	15456	0	15456	5.28%	816	12025	12841	83
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	15751	0	15751	0	15751	5.28%	832	10679	11511	73
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	214200	0	214200	0	214200	5.28%	11310	113098	124407	58
2012	22218	0	22218	0	22218	5.28%	1173	10558	11731	53
2013	1201920	0	1201920	0	1201920	5.28%	63461	507691	571152	48
2014	21924	0	21924	0	21924	5.28%	1158	8103	9261	42
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	17366	0	17366	0	17366	5.28%	917	3668	4585	26
2018	189980	0	189980	0	189980	5.28%	10031	30093	40124	21
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	12600	0	12600	0	12600	5.28%	665	665	1331	11
2021	12600	0	12600	0	12600	5.28%	665	0	665	5
TOTAL :	2980348	0	2980348	0	2980348		106617	1806023	1912640	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 14 YEARS

FURNITURE & OFFICE EQUIPMENTS

FROM 2011-12 LIFE : 18 YRS.

RATE OF DEP : 6.33% RATE OF DEP.: 5%

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.2022	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	9	10	11	13	14	15	16	17	
				(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1970	62492	0	0	62492	0	62492	5%	0	56243	56243	90
1971	145047	0	0	145047	0	145047	5%	0	130542	130542	90
1972	11403	0	0	11403	0	11403	5%	0	10263	10263	90
1973	47971	0	0	47971	0	47971	5%	0	43174	43174	90
1974	35999	0	0	35999	0	35999	5%	0	32399	32399	90
1975	94349	0	0	94349	0	94349	5%	0	84914	84914	90
1976	239685	0	0	239685	0	239685	5%	0	215717	215717	90
1977	106729	0	0	106729	0	106729	5%	0	96056	96056	90
1978	99970	6375	0	93595	0	93595	5%	0	84235	84235	90
1979	96530	0	0	96530	0	96530	5%	0	86877	86877	90
1980	178447	0	0	178447	0	178447	5%	0	160602	160602	90
1981	69941	0	0	69941	0	69941	5%	0	62947	62947	90
1982	304410	0	0	304410	0	304410	5%	0	273969	273969	90
1983	172075	3300	0	168775	0	168775	5%	0	151898	151898	90
1984	285671.25	0	0	285671	0	285671	5%	0	257104	257104	90
1985	272177	0	0	272177	0	272177	5%	0	244959	244959	90
1986	306431	0	0	306431	0	306431	5%	0	275788	275788	90
1987	-29515	0	0	-29515	0	-29515	5%	0	-26564	-26564	90
1988	415354	0	0	415354	0	415354	5%	0	373819	373819	90
1989	603115	0	0	603115	0	603115	5%	0	542804	542804	90
1990	99977	14079	0	85898	0	85898	5%	0	77308	77308	90
1991	593062.83	0	0	593063	0	593063	5%	0	533757	533757	90
1992	-233317	0	0	-233317	0	-233317	5%	0	-209985	-209985	90
1993	0	0	0	0	0	0	5%	0	0	0	#DIV/0!
1994	-311390	0	0	-311390	0	-311390	5%	0	-280251	-280251	90
1995	15728.24	0	0	15728	0	15728	5%	0	14155	14155	90
1996	17848	0	0	17848	0	17848	5%	0	16063	16063	90
1997	88045	0	0	88045	0	88045	5%	0	79241	79241	90
1998	73972	0	0	73972	0	73972	6.33%	0	66574	66574	90
1999	70189.4	0	0	70189	0	70189	6.33%	0	63170	63170	90
2000	512524	0	0	512524	0	512524	6.33%	0	461272	461272	90
2001	432419	0	0	432419	0	432419	6.33%	0	389177	389177	90
2002	171691	0	0	171691	0	171691	6.33%	0	154522	154522	90
2003	26951	0	0	26951	0	26951	6.33%	0	24256	24256	90
2004	1767727	0	0	1767727	0	1767727	6.33%	0	1590955	1590955	90
2005	141261	0	0	141261	0	141261	6.33%	0	127135	127135	90
2006	366521	0	0	366521	0	366521	6.33%	0	329869	329869	90
2007	821847	3910	0	817937	0	817937	6.33%	13971	722172	736143	90
2008	295597	0	0	295597	0	295597	6.33%	18711	246232	264944	90
2009	983090	0	0	983090	0	983090	6.33%	62230	769759	831989	85
2010	351459	0	0	351459	0	351459	6.33%	22247	257619	279867	80
2011	501625	0	0	501625	0	501625	6.33%	31753	317529	349281	70
2012	33139	0	0	33139	0	33139	6.33%	2098	18879	20977	63
2013	213212	0	0	213212	0	213212	6.33%	13496	107970	121467	57
2014	1215514	0	0	1215514	0	1215514	6.33%	76942	538594	615536	51
2015	106892	0	0	106892	0	106892	6.33%	6766	40597	47364	44
2016	96188	0	0	96188	0	96188	6.33%	6089	30444	36532	38
2017	0	0	0	0	0	0	6.33%	0	0	0	#DIV/0!
2018	409969	0	0	409969	0	409969	6.33%	25951	77853	103804	25
2019	120304	0	0	120304	0	120304	6.33%	7615	15230	22846	19
2020	23458	0	0	23458	0	23458	6.33%	1485	1485	2970	13
2021	810312	0	0	810312	0	810312	6.33%	51293	0	51293	6
TOTAL:	13334096	27664	0	13306432	0	13306432		340647	9739328	10079975	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 9 YEARS

ROOM A.C.

FROM 2011-12 | LIFE : 7 YRS.

RATE OF DEP : 9.50% | RATE OF DEP.: 12.86 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.2022	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
2001	10003	0	10003	0	10003	12.86%	0	9003	9003	90
2002	18600	0	18600	0	18600	12.86%	0	16740	16740	90
2003	93376	0	93376	0	93376	12.86%	0	84034	84034	90
2004	0	0	0	0	0	12.86%	0	0	0	0
2005	156903	0	156903	0	156903	12.86%	0	141212	141212	90
2006	117604	0	117604	0	117604	12.86%	0	105844	105844	90
2007	57250	0	57250	0	57250	9.50%	0	51525	51525	90
2008	194234	17173	177061	0	177061	9.50%	0	159355	159355	90
2009	207558	0	207558	0	207558	9.50%	0	186802	186802	90
2010	292796	0	292796	0	292796	9.50%	0	263516	263516	90
2011	248266	25136	223130	0	223130	9.50%	0	200817	200817	90
2012	121416	86613	34803	0	34803	9.50%	1566	29757	31323	90
2013	183317	0	183317	0	183317	9.50%	17415	139321	156736	86
2014	79650	0	79650	0	79650	9.50%	7567	52967	60534	76
2015	341369	0	341369	0	341369	9.50%	32430	194580	227010	67
2016	206319	0	206319	0	206319	9.50%	19600	98002	117602	57
2017	737187	0	737187	0	737187	9.50%	70033	280131	350164	48
2018	91450	0	91450	0	91450	9.50%	8688	26063	34751	38
2019	393033	0	393033	0	393033	9.50%	37338	74676	112014	29
2020	94700	0	94700	0	94700	9.50%	8997	8997	17993	19
2021	500501	0	500501	0	500501	9.50%	47548	0	47548	10
TOTAL :	4145532	128922	4016610	0	4016610		251181	2123342	2374523	

DEPRECIATION FOR THE YEAR 2022-23 | MERC ORDER : | LIFE : 7 YRS. | RATE OF DEP.: 12.86 %

PERSONAL COMPUTER

FROM 2011-12 | FROM : | LIFE : 6 YRS. | RATE OF DEP.: 15 %

RATE OF DEP ; 15% | 2005-06

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.2022	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDE D UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
2007	78563	0	78563	0	78563	15%	0	70706	70706	90
2008	175623	113270	62353	0	62353	15%	0	56118	56118	90
2009	3678284.3	0	3678284	0	3678284	15%	0	3310456	3310456	90
2010	1439527	0	1439527	0	1439527	15%	0	1295574	1295574	90
2011	668776	0	668776	0	668776	15%	0	601898	601898	90
2012	3092720	0	3092720	0	3092720	15%	0	2783448	2783448	90
2013	6178652	131697	6046955	0	6046955	15%	0	5442260	5442260	90
2014	3732350	0	3732350	0	3732350	15%	0	3359115	3359115	90
2015	5403892	0	5403892	0	5403892	15%	0	4863503	4863503	90
2016	13394136	0	13394136	0	13394136	15%	2009120	10045602	12054722	90
2017	3856372	0	3856372	0	3856372	15%	578456	2313823	2892279	75
2018	5711545	0	5711545	0	5711545	15%	856732	2570195	3426927	60
2019	2825965	0	2825965	0	2825965	15%	423895	847790	1271684	45
2020	2981341	0	2981341	0	2981341	15%	447201	447201	894402	30
2021	4560209	0	4560209	0	4560209	15%	684031	0	684031	15
TOTAL :	57777954	244967	57532987	0	57532987		4999435	38007688	43007123	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 6 YEARS

CYCLOSTYLE MACHINE

FROM 2011-12

LIFE : 10 YRS.

RATE OF DEP.: 9 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1997	356311	0	356311	0	356311	9%	0	320680	320680	90
1998	0	0	0	0	0	9%	0	0	0	#DIV/0!
1999	0	0	0	0	0	9%	0	0	0	#DIV/0!
2000	0	0	0	0	0	9%	0	0	0	#DIV/0!
2001	111	0	111	0	111	9%	0	100	100	90
2002	0	0	0	0	0	9%	0	0	0	#DIV/0!
2003	0	0	0	0	0	9%	0	0	0	#DIV/0!
2004	0	0	0	0	0	9%	0	0	0	#DIV/0!
2005	0	0	0	0	0	15%	0	0	0	#DIV/0!
2006	0	0	0	0	0	15%	0	0	0	#DIV/0!
2007	0	0	0	0	0	15%	0	0	0	#DIV/0!
2008	0	0	0	0	0	15%	0	0	0	#DIV/0!
2009	57289	0	57289	0	57289	15%	0	51560	51560	90
2010	42525	0	42525	0	42525	15%	0	38273	38273	90
2011	65875	0	65875	0	65875	15%	0	59288	59288	90
2012	0	0	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	147375	0	147375	0	147375	15%	0	132638	132638	90
2016	821420	0	821420	0	821420	15%	123213	616065	739278	90
2017	193536	0	193536	0	193536	15%	29030	116122	145152	75
2018	0	0	0	0	0	15%	0	0	0	#DIV/0!
2019	313290	0	313290	0	313290	15%	46994	93987	140981	45
2020	0	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	1997732	0	1997732	0	1997732		199237	1428711	1627948	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 6 YEARS

ELECTRONIC EQUIPMENTS (SEPERATED FROM (

FROM : 2011-12 | LIFE : 12 YRS.

RATE OF DEP. : 15% | RATE OF DEP.: 7.5 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
2000	16676	0	16676	0	16676	7.5%	0	15008	15008	90
2001	12940	0	12940	0	12940	7.5%	0	11646	11646	90
2002	0	0	0	0	0	7.5%	0	0	0	#DIV/0!
2003	162441	0	162441	0	162441	15%	0	146197	146197	90
2004	0	0	0	0	0	15%	0	0	0	#DIV/0!
2005	16944	0	16944	0	16944	15%	0	15250	15250	90
2006	14950	0	14950	0	14950	15%	0	13455	13455	90
2007	5840	0	5840	0	5840	15%	0	5256	5256	90
2008	47210	0	47210	0	47210	15%	0	42489	42489	90
2009	0	0	0	0	0	15%	0	0	0	#DIV/0!
2010	0	0	0	0	0	15%	0	0	0	#DIV/0!
2011	0	0	0	0	0	15%	0	0	0	#DIV/0!
2012	0	0	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	0	0	0	0	0	15%	0	0	0	#DIV/0!
2016	0	0	0	0	0	15%	0	0	0	#DIV/0!
2017	146849	0	146849	0	146849	15%	22027	88109	110137	75
2018	262661	0	262661	0	262661	15%	39399	118197	157597	60
2019	19989	0	19989	0	19989	15%	2998	5997	8995	45
2020	0	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	706500	0	706500	0	706500		64425	461604	526029	

DEPRECIATION FOR THE YEAR 2022-23 MERC ORDER : LIFE 17 YEARS LIFE : 10 YRS. RATE OF DEP.: 9 %

PLANT & MACHINERY (EDP-

FROM : 2011-12 FROM 2005 - LIFE : 6 YRS. RATE OF DEP.: 15 %

RATE OF DEP. : 5.28%

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1982	1982337	0	1982337	0	1982337	9%	0	1784103	1784103	90
1983	595068	0	595068	0	595068	9%	0	535561	535561	90
1984	1155443	0	1155443	0	1155443	9%	0	1039899	1039899	90
1985	1061569	0	1061569	0	1061569	9%	0	955412	955412	90
1986	-454962	0	-454962	0	-454962	9%	0	-409466	-409466	90
1987	505465	0	505465	0	505465	9%	0	454919	454919	90
1988	400206	0	400206	0	400206	9%	0	360185	360185	90
1989	1287766	0	1287766	0	1287766	9%	0	1158989	1158989	90
1990	154270	0	154270	0	154270	9%	0	138843	138843	90
1991	0	0	0	0	0	9%	0	0	0	#DIV/0!
1992	-505236	0	-505236	0	-505236	9%	0	-454712	-454712	90
1993	20000	0	20000	0	20000	9%	0	18000	18000	90
1994	264186	0	264186	0	264186	9%	0	237767	237767	90
1995	362268	0	362268	0	362268	9%	0	326041	326041	90
1996	372132	0	372132	0	372132	9%	0	334919	334919	90
1997	1887	0	1887	0	1887	9%	0	1698	1698	90
1998	5908095	985691	4922404	0	4922404	9%	0	4430164	4430164	90
1999	7301476	0	7301476	0	7301476	9%	0	6571328	6571328	90
2000	2169517	0	2169517	0	2169517	9%	0	1952565	1952565	90
2001	320598	0	320598	0	320598	9%	0	288538	288538	90
2002	0	0	0	0	0	9%	0	0	0	#DIV/0!
2003	145925	0	145925	0	145925	9%	0	131333	131333	90
2004	256500	0	256500	0	256500	9%	0	230850	230850	90
2005	178454	0	178454	0	178454	15%	0	160608	160608	90
2006	179499	0	179499	0	179499	15%	0	161549	161549	90
2007	968958	0	968958	0	968958	15%	0	872062	872062	90
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	24631421	985691	23645730	0	23645730		0	21281157	21281157	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 17 YEARS

PLANT & MACHINERY (STORES DEPART

FROM : 2011-12

RATE OF DEP. : 5.28%

LIFE : 22 YRS.

RATE OF DEP.: 4.09 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	3	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1988	237359	0	237359	0	237359	4.09%	0	213623	213623	90
1989	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1990	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1991	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1992	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1993	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1994	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1995	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1996	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1997	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1998	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1999	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2000	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2001	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2002	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2003	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2004	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2005	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2006	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2007	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2008	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2009	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2010	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	237359	0	237359	0	237359		0	213623	213623	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 17 YEARS

SECURITY EQUIPMENT

FROM : 2011-12

LIFE : 100 YRS.

RATE OF DEP. : 5.28

RATE OF DEP.: 0.90 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1992	1059000	0	1059000	0	1059000	5.28%	55915	749772	805687	76
1993	2071350	0	2071350	0	2071350	5.28%	109367	1447874	1557241	75
1994	28000	0	28000	0	28000	5.28%	1478	19320	20798	74
1995	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1996	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1997	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1998	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1999	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2000	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2001	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2002	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2003	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2004	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2005	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2006	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2007	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	102038	0	102038	0	102038	5.28%	5388	43101	48488	48
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	3260388	0	3260388	0	3260388		172148	2260067	2432215	

DEPRECIATION FOR THE YEAR 2022-23

FAX MACHINE

LIFE : 6 YRS.

RATE OF DEP.: 15 %

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	10	11	13	14	15	16	17	
			(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
1999	22030	0	22030	0	22030	15%	0	19827	19827	90
2011	17430	0	17430	0	17430	15%	0	15687	15687	90
2012	38450	0	38450	0	38450	15%	0	34605	34605	90
2013	37550	0	37550	0	37550	15%	0	33795	33795	90
2014	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	62055	0	62055	0	62055	15%	0	55850	55850	90
2016	41763	0	41763	0	41763	15%	6264	31322	37587	90
2017	0	0	0	0	0	15%	0	0	0	#DIV/0!
2018	0	0	0	0	0	15%	0	0	0	#DIV/0!
2019	0	0	0	0	0	15%	0	0	0	#DIV/0!
2020	0	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	219278	0	219278	0	219278		6264	191086	197350	

SUMMARY OF PROVISION OF DEPRECIATION ON ASSETS OF GENERAL ADMINISTRATION DIVISION
FOR THE YEAR 2022-23

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	DEP. PROVISION FOR YEAR 2022-23
1	7	8	9	10	11	13	15
				(7-8-/+9)		(10-11-12)	(13*14)
LAND	41129691			41129691		41129691	0
BUILDING	784236357	0	0	784236357	0	784236357	24421895
STATIC ROOM A.C.	2424051	23309	0	2400742	0	2400742	0
MOTOR VEHICLE	40041359	745730	0	39295630	0	39295630	730773
TOOLS & EQUIPMENT	2980348	0	0	2980348	0	2980348	106617
FURNITURE & OFF.EQUIP.	13334096	27664	0	13306432	0	13306432	340647
ROOM A.C.	4145532	128922	0	4016610	0	4016610	251181
PERSONAL COMPUTER	57777954	244967	0	57532987	0	57532987	4999435
CYCLOSTYLE MACHINE	1997732	0	0	1997732	0	1997732	199237
ELECTRONIC EQUIPMENT	706500	0	0	706500	0	706500	64425
PL & MACH. EDP.	24631421	985691	0	23645730	0	23645730	0
PL & MACH STOCK	237359	0	0	237359	0	237359	0
SECURITY EQUIPMENT	3260388	0	0	3260388	0	3260388	172148
FAX MACHINE	219278	0	0	219278	0	219278	6264
TOTAL :	977122066	2156283	0	974965783	0	974965783	31292622

DETAILS OF E-6 WISE ASSETS GROUPING - GENERAL ADMINISTRATION DIVISION

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	DEP. PROVISION FOR YEAR 2022-23
LAND	**41129691**	**0**	**0**	**41129691**	**0**	**41129691**	**0**
BUILDING	784236357	0	0	784236357	0	784236357	24421895
STATIC ROOM A.C.	2424051	23309	0	2400742	0	2400742	0
BUILDINGS	**786660408**	**23309**	**0**	**786637099**	**0**	**786637099**	**24421895**
MOTOR VEHICLES	**40041359**	**745730**	**0**	**39295630**	**0**	**39295630**	**730773**
PL & MACH EDP	24631421	985691	0	23645730	0	23645730	0
PL & MACH STOCK	237359	0	0	237359	0	237359	0
PLANT AND MACHINERY	**24868780**	**985691**	**0**	**23883089**	**0**	**23883089**	**0**
FURNITURE & OFF. EQUIP.	13334096	27664	0	13306432	0	13306432	340647
ROOM A.C.	4145532	128922	0	4016610	0	4016610	251181
PERSONAL COMPUTER	57777954	244967	0	57532987	0	57532987	4999435
CYCLOSTYLE MACHINE	1997732	0	0	1997732	0	1997732	199237
ELECTRONIC EQUIPMENT	706500	0	0	706500	0	706500	64425
FAX MACHINE	219278	0	0	219278	0	219278	6264
FURNITURE AND OFFICE EQUIPMENTS	**78181092**	**401553**	**0**	**77779539**	**0**	**77779539**	**5861189**
TOOLS AND EQUIPMENTS	**2980348**	**0**	**0**	**2980348**	**0**	**2980348**	**106617**
SECURITY EQUIPMENTS	**3260388**	**0**	**0**	**3260388**	**0**	**3260388**	**172148**
TOTAL :	**977122066**	**2156283**	**0**	**974965783**	**0**	**974965783**	**31292622**

DEPRECIATION FOR THE YEAR 2015-16

LAND

YEAR	DEP. PROVIDED UPTO	BALANCE YEAR	ASSET USED UPTO THE YEAR	ESTIMATED LIFE OF ASSETS	BAL.YEAR FOR DEP. TO BE PROVIDED	BOOK VALUE AS ON 31.03.2015	IDC	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.15	RATE OF DEP.	DEP. PROVISION FOR YEAR 2015-16	CUMM.DEP. PROVIDED UPTO 2014-15	CUMM. DEP. PROVIDED UPTO 2015-16	REMARK
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
		(2-1)								(7-8-9-/+10)			(11-12-13)		(14*15)		(16+17)	
	2013	2013	50	50	0	22953418	0	0	0	2.3E+07	0	0	2.3E+07	1.80%	0	0	0	
1947	2013	66	50	50	0	60798	0	0	0	60798	0	0	60798	1.80%	0	0	0	
1948	2013	65	50	50	0	416779	0	0	0	416779	0	0	416779	1.80%	0	0	0	

DEPRECIATION FOR THE YEAR 2022-23 LIFE : 50 YRS RATE OF DEP : 1.80%

BUILDING

FR. 1993-94 LIFE : 45 YRS RATE OF DEP : 2%

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	14	15	16	17	18	
			(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1946	3689254	0	3689254	3689254	1.80%	0	3320329	3320329	90
1947	60798	0	60798	60798	1.80%	0	54718	54718	90
1948	416779	0	416779	416779	1.80%	0	375101	375101	90
1949	523698	0	523698	523698	1.80%	0	471328	471328	90
1950	104638	0	104638	104638	1.80%	0	94174	94174	90
1951	64828	0	64828	64828	1.80%	0	58345	58345	90
1952	28438	0	28438	28438	1.80%	0	25594	25594	90
1953	59705	0	59705	59705	1.80%	0	53735	53735	90
1954	86307	0	86307	86307	1.80%	0	77676	77676	90
1955	509635	0	509635	509635	1.80%	0	458672	458672	90
1956	464918	0	464918	464918	1.80%	0	418426	418426	90
1957	596871	0	596871	596871	1.80%	0	537184	537184	90
1958	390151	0	390151	390151	1.80%	0	351136	351136	90
1959	594712	0	594712	594712	1.80%	0	535241	535241	90
1960	582821	0	582821	582821	1.80%	0	524539	524539	90
1961	465046	0	465046	465046	1.80%	0	418541	418541	90
1962	584093	0	584093	584093	1.80%	0	525684	525684	90
1963	548657	0	548657	548657	1.80%	0	493791	493791	90
1964	742423	0	742423	742423	1.80%	0	668181	668181	90
1965	657964	0	657964	657964	1.80%	0	592168	592168	90
1966	878027	0	878027	878027	1.80%	0	790224	790224	90
1967	1354879	0	1354879	1354879	1.80%	0	1219391	1219391	90
1968	1523688	0	1523688	1523688	1.80%	0	1371319	1371319	90
1969	1988858	0	1988858	1988858	1.80%	0	1789972	1789972	90
1970	598128	0	598128	598128	1.80%	0	538315	538315	90
1971	2076824	0	2076824	2076824	1.80%	0	1869142	1869142	90
1972	1883242	0	1883242	1883242	1.80%	0	1694918	1694918	90
1973	548044	0	548044	548044	3.34%	0	493240	493240	90
1974	1762733	0	1762733	1762733	3.34%	0	1586460	1586460	90
1975	3094136	0	3094136	3094136	3.34%	0	2784723	2784723	90
1976	729262	0	729262	729262	3.34%	0	656336	656336	90
1977	1076731	0	1076731	1076731	3.34%	0	969058	969058	90
1978	942140	0	942140	942140	3.34%	0	847926	847926	90
1979	1135276	0	1135276	1135276	3.34%	0	1021748	1021748	90
1980	494826	0	494826	494826	3.34%	0	445343	445343	90
1981	863390	0	863390	863390	3.34%	6907	770144	777051	90
1982	1900520	0	1900520	1900520	3.34%	49413	1661054	1710467	90
1983	2046003	0	2046003	2046003	3.34%	68337	1751379	1819715	89
1984	4549574	0	4549574	4549574	3.34%	151956	3812543	3964499	87
1985	3541022	0	3541022	3541022	3.34%	118270	2903638	3021908	85
1986	11474970	0	11474970	11474970	3.34%	383264	9202926	9586190	84
1987	6254060	0	6254060	6254060	3.34%	208886	4903183	5112069	82
1988	17539190	0	17539190	17539190	3.34%	585809	13435020	14020828	80
1989	39063097	0	39063097	39063097	3.34%	1304707	29219197	30523904	78
1990	23074264	0	23074264	23074264	3.34%	770680	16844213	17614893	76
1991	29057187	0	29057187	29057187	3.34%	970510	20688717	21659227	75
1992	27386962	0	27386962	27386962	3.34%	914725	19006552	19921276	73
1993	44715994	0	44715994	44715994	3.34%	1493514	31927220	33420734	75
1994	54723367	44562	54678805	54678805	3.34%	1826272	37947091	39773363	73
1995	15210779	0	15210779	15210779	3.34%	508040	10252065	10760105	71
1996	17549616	0	17549616	17549616	3.34%	586157	11477449	12063606	69
1997	19737275	0	19737275	19737275	3.34%	659225	12513432	13172657	67
1998	20316674	0	20316674	20316674	3.34%	678577	12474438	13153015	65
1999	17675030	0	17675030	17675030	3.34%	590346	10498968	11089314	63
2000	12342068	0	12342068	12342068	3.34%	412225	7084347	7496572	61
2001	5121950	0	5121950	5121950	3.34%	171073	2837560	3008633	59
2002	3432871	0	3432871	3432871	3.34%	114658	1833153	1947811	57
2003	4107328	0	4107328	4107328	3.34%	137185	2111167	2248351	55
2004	2857785	0	2857785	2857785	3.34%	95450	1411746	1507196	53
2005	12945755	0	12945755	12945755	3.34%	432388	6136288	6568676	51
2006	18835475	0	18835475	18835475	3.34%	629105	8551306	9180411	49
2007	18467732	0	18467732	18467732	3.34%	616822	8014996	8631818	47
2008	12815056	0	12815056	12815056	3.34%	428023	5305433	5733456	45
2009	35455280	0	35455280	35455280	3.34%	1184206	13969380	15153587	43
2010	36732835	0	36732835	36732835	3.34%	1226877	13738080	14964957	41
2011	35334694	0	35334694	35334694	3.34%	1180179	11801788	12981967	37
2012	39840121	0	39840121	39840121	3.34%	1330660	11975940	13306600	33
2013	35295322	0	35295322	35295322	3.34%	1178864	9430910	10609774	30
2014	13561052	0	13561052	13561052	3.34%	452939	3170574	3623513	27
2015	35578074	0	35578074	35578074	3.34%	1188308	7129846	8318154	23
2016	17536579	0	17536579	17536579	3.34%	585722	2928609	3514331	20
2017	45662057	0	45662057	45662057	3.34%	1525113	6100450	7625563	17
2018	5571383	0	5571383	5571383	3.34%	186084	558252	744337	13
2019	8295033	0	8295033	8295033	3.34%	277054	554109	831163	10
2020	9121875	0	9121875	9121875	3.34%	304671	304671	609341	7
2021	27310109	0	27310109	27310109	3.34%	912158	0	912158	3
TOTAL :	824157938	44562	824113375	824113375		26445357	404370511	430815868	

DEPRECIATION FOR THE YEAR 2022- MERC ORDER : LIFE 27 YEARS

BUILDING - CASH COL

FROM : 2011 - 12 LIFE : 20 YRS

RATE OF DEP. : 3.34% RATE OF DEP. : 4.50 %

YEAR	BOOK VALUE AS ON 01.04.2022	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	11	14	15	16	17	18	
		(7-8-9-/+10	(11-12-13)		(14*15)		(16+17)	
1973	22844	22844	22844	3.34%	0	20560	20560	90
2002	110355	110355	110355	3.34%	3686	86518	90204	82
2003	0	0	0	3.34%	0	0	0	#DIV/0!
2004	0	0	0	3.34%	0	0	0	#DIV/0!
2005	0	0	0	3.34%	0	0	0	#DIV/0!
2006	0	0	0	3.34%	0	0	0	#DIV/0!
2007	0	0	0	3.34%	0	0	0	#DIV/0!
2008	0	0	0	3.34%	0	0	0	#DIV/0!
2009	16267	16267	16267	3.34%	543	7629	8173	50
2010	0	0	0	3.34%	0	0	0	#DIV/0!
2011	0	0	0	3.34%	0	0	0	#DIV/0!
2012	0	0	0	3.34%	0	0	0	#DIV/0!
2013	0	0	0	3.34%	0	0	0	#DIV/0!
2014	0	0	0	3.34%	0	0	0	#DIV/0!
2015	0	0	0	3.34%	0	0	0	#DIV/0!
2016	0	0	0	3.34%	0	0	0	#DIV/0!
2017	0	0	0	3.34%	0	0	0	#DIV/0!
2018	0	0	0	3.34%	0	0	0	#DIV/0!
2019	0	0	0	3.34%	0	0	0	#DIV/0!
2020	0	0	0	3.34%	0	0	0	#DIV/0!
2021	0	0	0	3.34%	0	0	0	#DIV/0!
TOTAL:	149466	149466	149466		4229	114707	118936	

DEPRECIATION FOR THE YEAR 2022-23

MOTOR VEHICLES

LIFE : 8 YRS.

RATE OF DEP.: 11.25%

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.2022	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	11	14	15	16	17	18	
		(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1992	162127	162127	162127	12.86%	0	145914	145914	90
1993	80761	80761	80761	11.25%	0	72685	72685	90
1994	0	0	0	11.25%	0	0	0	#DIV/0!
1995	0	0	0	11.25%	0	0	0	#DIV/0!
1996	0	0	0	11.25%	0	0	0	#DIV/0!
1997	0	0	0	11.25%	0	0	0	#DIV/0!
1998	209635	209635	209635	11.25%	0	188672	188672	90
1999	0	0	0	11.25%	0	0	0	#DIV/0!
2000	0	0	0	11.25%	0	0	0	#DIV/0!
2001	1142677	1142677	1142677	11.25%	0	1028409	1028409	90
2002	0	0	0	11.25%	0	0	0	#DIV/0!
2003	9049117	9049117	9049117	11.25%	0	8144205	8144205	90
2004	6905758	6905758	6905758	11.25%	0	6215182	6215182	90
2005	3603828	3603828	3603828	11.25%	0	3243445	3243445	90
2006	6982199	6982199	6982199	11.25%	0	6283979	6283979	90
2007	20628410	20628410	20628410	11.25%	0	18565569	18565569	90
2008	13518482	13518482	13518482	11.25%	0	12166634	12166634	90
2009	33858641	33858641	33858641	11.25%	0	30472777	30472777	90
2010	6825688	6825688	6825688	11.25%	0	6143119	6143119	90
2011	10192665	10192665	10192665	11.25%	0	9173399	9173399	90
2012	0	0	0	11.25%	0	0	0	#DIV/0!
2013	0	0	0	11.25%	0	0	0	#DIV/0!
2014	4325118	4325118	4325118	11.25%	486576	3406030	3892606	90
2015	1255040	1255040	1255040	11.25%	141192	847152	988344	79
2016	9961570	9961570	9961570	11.25%	1120677	5603383	6724060	68
2017	2061074	2061074	2061074	11.25%	231871	927483	1159354	56
2018	2800000	2800000	2800000	11.25%	315000	945000	1260000	45
2019	3199996	3199996	3199996	11.25%	360000	719999	1079999	34
2020	1503910	1503910	1503910	11.25%	169190	169190	338380	23
2021	0	0	0	11.25%	0	0	0	#DIV/0!
TOTAL :	138266695	138266695	138266695		2824505	114462226	117286731	

DEPRECIATION FOR THE YEAR 2022-23

FROM 1993-94

MACHINE TOOLS

LIFE : 18 \ LIFE : 20 YRS.

RATE OF DEP : 5% RATE OF DEP.: 4.5%

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	14	15	16	17	18	
			(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1981	0	0	0	0	4.5%	0	0	0	#DIV/0!
1982	120347	0	120347	120347	4.5%	0	108312	108312	90
1983	74164	0	74164	74164	4.5%	0	66748	66748	90
1984	0	0	0	0	4.5%	0	0	0	#DIV/0!
1985	113751	0	113751	113751	4.5%	0	102376	102376	90
1986	0	0	0	0	4.5%	0	0	0	#DIV/0!
1987	662135	0	662135	662135	4.5%	0	595922	595922	90
1988	42938	0	42938	42938	4.5%	0	38644	38644	90
1989	75128	0	75128	75128	4.5%	0	67615	67615	90
1990	134208	0	134208	134208	4.5%	0	120787	120787	90
1991	2414553	0	2414553	2414553	4.5%	0	2173097	2173097	90
1992	1640360	0	1640360	1640360	4.5%	0	1476324	1476324	90
1993	11846632	0	11846632	11846632	5%	0	10661969	10661969	90
1994	1693038	141127	1551911	1551911	5%	0	1396720	1396720	90
1995	1305662	0	1305662	1305662	5%	0	1175096	1175096	90
1996	921701	0	921701	921701	5%	0	829531	829531	90
1997	4169286	0	4169286	4169286	5%	0	3752357	3752357	90
1998	710792	0	710792	710792	5.28%	0	639713	639713	90
1999	15402420	0	15402420	15402420	5.28%	0	13862178	13862178	90
2000	5350395	140003	5210392	5210392	5.28%	0	4689353	4689353	90
2001	1526141	0	1526141	1526141	5.28%	0	1373527	1373527	90
2002	244777	0	244777	244777	5.28%	0	220299	220299	90
2003	1180391	0	1180391	1180391	5.28%	0	1062352	1062352	90
2004	1239150	0	1239150	1239150	5.28%	0	1115235	1115235	90
2005	3973468	0	3973468	3973468	5.28%	87416	3488705	3576121	90
2006	8773924	0	8773924	8773924	5.28%	463263	7264809	7728072	88
2007	32475216	0	32475216	32475216	5.28%	1714691	25265718	26980409	83
2008	11378503	17506	11360997	11360997	5.28%	599861	8270806	8870667	78
2009	8701904	9216	8692688	8692688	5.28%	458974	5893643	6352617	73
2010	14786642	88218	14698424	14698424	5.28%	776077	9230610	10006687	68
2011	53990720	0	53990720	53990720	5.28%	2850710	28507100	31357810	58
2012	27356662	0	27356662	27356662	5.28%	1444432	12999886	14444318	53
2013	3312195	0	3312195	3312195	5.28%	174884	1399071	1573955	48
2014	1786992	0	1786992	1786992	5.28%	94353	660472	754825	42
2015	5292384	0	5292384	5292384	5.28%	279438	1676627	1956065	37
2016	41842236	0	41842236	41842236	5.28%	2209270	11046350	13255620	32
2017	1936615	0	1936615	1936615	5.28%	102253	409013	511266	26
2018	19960167	0	19960167	19960167	5.28%	1053897	3161690	4215587	21
2019	6745466	0	6745466	6745466	5.28%	356161	712321	1068482	16
2020	56885739	0	56885739	56885739	5.28%	3003567	3003567	6007134	11
2021	47143715	0	47143715	47143715	5.28%	2489188	0	2489188	5
TOTAL :	397210517	396071	396814446	396814446		18158435	168518545	186676979	

DEPRECIATION FOR THE YEAR 20 MERC ORDER : LIFE 14 YEARS FROM 1993-94

FURNITURE FROM : 2011-12 LIFE : 18 YRS LIFE : 20 YRS.

RATE OF DEP. : 6.33% RATE OF DEP : 5% RATE OF DEP.: 4.5%

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	14	15	16	17	18	
			(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1975	0	0	0	0	4.5%	0	0	0	#DIV/0!
1976	15914	0	15914	15914	4.5%	0	14323	14323	90
1977	0	0	0	0	4.5%	0	0	0	#DIV/0!
1978	21368	0	21368	21368	4.5%	0	19231	19231	90
1979	21532	0	21532	21532	4.5%	0	19379	19379	90
1980	8115	0	8115	8115	4.5%	0	7304	7304	90
1981	4905	0	4905	4905	4.5%	0	4415	4415	90
1982	14290	0	14290	14290	4.5%	0	12861	12861	90
1983	-18421	0	-18421	-18421	4.5%	0	-16579	-16579	90
1984	122294	0	122294	122294	4.5%	0	110065	110065	90
1985	80338	0	80338	80338	4.5%	0	72304	72304	90
1986	48065	3105	44960	44960	4.5%	0	40464	40464	90
1987	86009	0	86009	86009	4.5%	0	77408	77408	90
1988	101599	0	101599	101599	4.5%	0	91439	91439	90
1989	165429	0	165429	165429	4.5%	0	148886	148886	90
1990	6115	0	6115	6115	4.5%	0	5504	5504	90
1991	66216	0	66216	66216	4.5%	0	59594	59594	90
1992	101562	0	101562	101562	4.5%	0	91406	91406	90
1993	-11336	0	-11336	-11336	5%	0	-10202	-10202	90
1994	0	0	0	0	5%	0	0	0	#DIV/0!
1995	0	0	0	0	5%	0	0	0	#DIV/0!
1996	0	0	0	0	5%	0	0	0	#DIV/0!
1997	0	0	0	0	6.33%	0	0	0	#DIV/0!
1998	0	0	0	0	6.33%	0	0	0	#DIV/0!
1999	9526	0	9526	9526	6.33%	0	8574	8574	90
2000	0	0	0	0	6.33%	0	0	0	#DIV/0!
2001	3067810	0	3067810	3067810	6.33%	0	2761028	2761028	90
2002	0	0	0	0	6.33%	0	0	0	#DIV/0!
2003	2800652	0	2800652	2800652	6.33%	0	2520586	2520586	90
2004	12712684	0	12712684	12712684	6.33%	0	11441416	11441416	90
2005	534620	0	534620	534620	6.33%	0	481158	481158	90
2006	236228	0	236228	236228	6.33%	0	212605	212605	90
2007	154750	0	154750	154750	6.33%	2631	136644	139275	90
2008	1018747	0	1018747	1018747	6.33%	64487	848616	913103	90
2009	0	0	0	0	6.33%	0	0	0	#DIV/0!
2010	375247	0	375247	375247	6.33%	23753	275056	298809	80
2011	0	0	0	0	6.33%	0	0	0	#DIV/0!
2012	1535968	0	1535968	1535968	6.33%	97227	875041	972268	63
2013	12431	0	12431	12431	6.33%	787	6295	7082	57
2014	61875	0	61875	61875	6.33%	3917	27417	31334	51
2015	172655	0	172655	172655	6.33%	10929	65574	76503	44
2016	99675	0	99675	99675	6.33%	6309	31547	37857	38
2017	472000	0	472000	472000	6.33%	29878	119510	149388	32
2018	1710892	0	1710892	1710892	6.33%	108299	324898	433198	25
2019	814380	0	814380	814380	6.33%	51550	103101	154651	19
2020	41814	0	41814	41814	6.33%	2647	2647	5294	13
2021	403522	0	403522	403522	6.33%	25543	0	25543	6
TOTAL:	27069470	3105	27066365	27066365		427957	20989514	21417471	

DEPRECIATION FOR THE YEAR 20 MERC ORDER : LIFE 9 YEARS FROM 1993-94

ROOM A.C.

FROM : 2011-12 LIFE : 5 YRS LIFE : 7 YRS.

RATE OF DEP. : 9.50% RATE IF DEP : 18% RATE OF DEP.: 12.86 %

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	14	15	16	17	18	
			(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1992	286759	57820	228939	228939	12.86%	0	206045	206045	90
1993	207916	0	207916	207916	18%	0	187125	187125	90
1994	232437	0	232437	232437	18%	0	209193	209193	90
1995	468919	0	468919	468919	18%	0	422027	422027	90
1996	160629	18248	142381	142381	18%	0	128143	128143	90
1997	252849	0	252849	252849	18%	0	227564	227564	90
1998	670244	0	670244	670244	18%	0	603220	603220	90
1999	185286	59280	126006	126006	18%	0	113405	113405	90
2000	58024	0	58024	58024	18%	0	52221	52221	90
2001	2321960	0	2321960	2321960	18%	0	2089764	2089764	90
2002	15631	0	15631	15631	18%	0	14068	14068	90
2003	593263	0	593263	593263	18%	0	533937	533937	90
2004	296297	0	296297	296297	18%	0	266667	266667	90
2005	152370	0	152370	152370	18%	0	137133	137133	90
2006	311246	0	311246	311246	18%	0	280121	280121	90
2007	2294061	33800	2260261	2260261	18%	0	2034235	2034235	90
2008	2879983	0	2879983	2879983	18%	0	2591985	2591985	90
2009	1258115	0	1258115	1258115	9.50%	0	1132304	1132304	90
2010	0	0	0	0	9.50%	0	0	0	#DIV/0!
2011	1287285	0	1287285	1287285	9.50%	0	1158557	1158557	90
2012	450029	0	450029	450029	9.50%	20252	384775	405027	90
2013	605073	0	605073	605073	9.50%	57482	459855	517337	86
2014	297587	0	297587	297587	9.50%	28271	197895	226166	76
2015	48500	0	48500	48500	9.50%	4608	27645	32253	67
2016	3181007	0	3181007	3181007	9.50%	302196	1510978	1813174	57
2017	2842320	0	2842320	2842320	9.50%	270020	1080082	1350102	48
2018	1128582	0	1128582	1128582	9.50%	107215	321646	428861	38
2019	572485	0	572485	572485	9.50%	54386	108772	163158	29
2020	0	0	0	0	9.50%	0	0	0	#DIV/0!
2021	1603066	0	1603066	1603066	9.50%	152291	0	152291	10
TOTAL :	24661923	169148	24492775	24492775		996721	16479362	17476083	

DEPRECIATION FOR THE YEAR 2022-23

LIFE : 7 YRS. RATE OF DEP.: 12.86 %

PERSONAL COMPUTER

FROM : 1993-94 LIFE : 5 YRS. RATE OF DEP.: 18 %

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	3	15	16	17	18	
			(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1995	55826	0	55826	55826	12.86%	0	50243	50243	90
1996	508997	0	508997	508997	12.86%	0	458097	458097	90
1997	3329768	0	3329768	3329768	12.86%	0	2996791	2996791	90
1998	506157	0	506157	506157	12.86%	0	455541	455541	90
1999	1254293	0	1254293	1254293	12.86%	0	1128864	1128864	90
2000	3570148	0	3570148	3570148	12.86%	0	3213133	3213133	90
2001	1898348	0	1898348	1898348	12.86%	0	1708513	1708513	90
2002	10600501	0	10600501	10600501	12.86%	0	9540451	9540451	90
2003	6406342	0	6406342	6406342	12.86%	0	5765708	5765708	90
2004	2179076	0	2179076	2179076	12.86%	0	1961168	1961168	90
2005	445681	98280	347401	347401	15%	0	312661	312661	90
2006	20265165	75000	20190165	20190165	15%	0	18171149	18171149	90
2007	4860578	0	4860578	4860578	15%	0	4374520	4374520	90
2008	3257010	13520	3243490	3243490	15%	0	2919141	2919141	90
2009	24143714	376008	23767706	23767706	15%	0	21390935	21390935	90
2010	25153048	336927	24816121	24816121	15%	0	22334509	22334509	90
2011	10888752	381322	10507430	10507430	15%	0	9456687	9456687	90
2012	8676282	623768	8052514	8052514	15%	0	7247263	7247263	90
2013	7006709	695620	6311089	6311089	15%	0	5679980	5679980	90
2014	763834	0	763834	763834	15%	0	687451	687451	90
2015	1955823	0	1955823	1955823	15%	0	1760241	1760241	90
2016	13156591	0	13156591	13156591	15%	1973489	9867443	11840932	90
2017	1391934	0	1391934	1391934	15%	208790	835160	1043950	75
2018	17495482	0	17495482	17495482	15%	2624322	7872967	10497289	60
2019	6976048	0	6976048	6976048	15%	1046407	2092814	3139222	45
2020	9678856	0	9678856	9678856	15%	1451828	1451828	2903657	30
2021	4261218	0	4261218	4261218	15%	639183	0	639183	15
TOTAL :	190686180	2600445	188085735	188085735.4		7944019	143733258	151677278	

DEPRECIATION FOR THE \ MERC ORDER : LIFE 6 YEARS

ELECTRONIC EC FROM : 2011-12 LIFE : 12 YRS.

RATE OF DEP.: 15% RATE OF DEP.: 7.5 %

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	11	14	15	16	17	18	
		(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1991	697248	697248	697248	7.5%	0	627523	627523	90
1992	537281	537281	537281	7.5%	0	483553	483553	90
1993	285348	285348	285348	7.5%	0	256813	256813	90
1994	0	0	0	7.5%	0	0	0	#DIV/0!
1995	0	0	0	7.5%	0	0	0	#DIV/0!
1996	963206	963206	963206	7.5%	0	866886	866886	90
1997	38331	38331	38331	7.5%	0	34498	34498	90
1998	0	0	0	7.5%	0	0	0	#DIV/0!
1999	729367	729367	729367	7.5%	0	656430	656430	90
2000	138818	138818	138818	7.5%	0	124936	124936	90
2001	0	0	0	7.5%	0	0	0	#DIV/0!
2002	0	0	0	7.5%	0	0	0	#DIV/0!
2003	0	0	0	15%	0	0	0	#DIV/0!
2004	0	0	0	15%	0	0	0	#DIV/0!
2005	0	0	0	15%	0	0	0	#DIV/0!
2006	60451	60451	60451	15%	0	54406	54406	90
2007	780567	780567	780567	15%	0	702510	702510	90
2008	37500	37500	37500	15%	0	33750	33750	90
2009	0	0	0	15%	0	0	0	#DIV/0!
2010	0	0	0	15%	0	0	0	#DIV/0!
2011	0	0	0	15%	0	0	0	#DIV/0!
2012	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	15%	0	0	0	#DIV/0!
2015	24995	24995	24995	15%	0	22496	22496	90
2016	0	0	0	15%	0	0	0	#DIV/0!
2017	332628	332628	332628	15%	49894	199577	249471	75
2018	99199	99199	99199	15%	14880	44640	59519	60
2019	101200	101200	101200	15%	15180	30360	45540	45
2020	554719	554719	554719	15%	83208	83208	166416	30
2021	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	5380858	5380858	5380858		163162	4221585	4384747	

DEPRECIATION FOR THE YEAR 2022- MERC ORDER : LIFE 6 YEARS

ELECTRONIC EQUIPME

EFFECTIVE FROM 2011-12 LIFE : 12 YRS.

RATE OF DEP : 15% RATE OF DEP.: 7.5 %

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISI ON FOR YEAR 2022-23	CUMM.D EP. PROVIDE D UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDE D UP TO 2022-23
1	7	11	14	15	16	17	18	
		(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1994	885814	885814	885814	7.50%	0	797233	797233	90
1995	396816	396816	396816	7.50%	0	357134	357134	90
1996	90664	90664	90664	7.50%	0	81598	81598	90
1997	0	0	0	7.50%	0	0	0	#DIV/0!
1998	0	0	0	7.50%	0	0	0	#DIV/0!
1999	4615618	4615618	4615618	7.50%	0	4154056	4154056	90
2000	0	0	0	7.50%	0	0	0	#DIV/0!
2001	3271811	3271811	3271811	7.50%	0	2944630	2944630	90
2002	0	0	0	7.50%	0	0	0	#DIV/0!
2003	0	0	0	15%	0	0	0	#DIV/0!
2004	0	0	0	15%	0	0	0	#DIV/0!
2005	0	0	0	15%	0	0	0	#DIV/0!
2006	0	0	0	15%	0	0	0	#DIV/0!
2007	838761	838761	838761	15%	0	754885	754885	90
2008	6940844	6940844	6940844	15%	0	6246760	6246760	90
2009	0	0	0	15%	0	0	0	#DIV/0!
2010	0	0	0	15%	0	0	0	#DIV/0!
2011	0	0	0	15%	0	0	0	#DIV/0!
2012	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	15%	0	0	0	#DIV/0!
2015	0	0	0	15%	0	0	0	#DIV/0!
2016	0	0	0	15%	0	0	0	#DIV/0!
2017	0	0	0	15%	0	0	0	#DIV/0!
2018	1194160	1194160	1194160	15%	179124	537372	716496	60
2019	5165947	5165947	5165947	15%	774892	1549784	2324676	45
2020	3496489	3496489	3496489	15%	524473	524473	1048947	30
2021	522150	522150	522150	15%	78323	0	78323	15
TOTAL :	27419074	27419074	2.7E+07		1556812	17947925	19504737	

DEPRECIATION FOR THE YEAR 2022-23

MERC ORDER : LIFE 6 YEARS

CYCLOSTYLE MACHINE

EFFECTIVE FROM : 2011-1 LIFE : 10 YRS.

RATE OF DEP : 15% RATE OF DEP.: 9 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	14	15	16	17	18	
			(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1999	407910	0	407910	407910	9%	0	367119	367119	90
2000	65966	0	65966	65966	9%	0	59369	59369	90
2001	0	0	0	0	9%	0	0	0	#DIV/0!
2002	0	0	0	0	9%	0	0	0	#DIV/0!
2003	329227	0	329227	329227	9%	0	296304	296304	90
2004	90664	0	90664	90664	9%	0	81598	81598	90
2005	0	0	0	0	15%	0	0	0	#DIV/0!
2006	60948	60948	0	0	15%	0	0	0	#DIV/0!
2007	304875	1	304874	304874	15%	0	274388	274388	90
2008	0	0	0	0	15%	0	0	0	#DIV/0!
2009	0	0	0	0	15%	0	0	0	#DIV/0!
2010	0	0	0	0	15%	0	0	0	#DIV/0!
2011	0	0	0	0	15%	0	0	0	#DIV/0!
2012	0	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	0	15%	0	0	0	#DIV/0!
2015	0	0	0	0	15%	0	0	0	#DIV/0!
2016	229909	0	229909	229909	15%	34486	172432	206918	90
2017	0	0	0	0	15%	0	0	0	#DIV/0!
2018	0	0	0	0	15%	0	0	0	#DIV/0!
2019	0	0	0	0	15%	0	0	0	#DIV/0!
2020	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	1489499	60949	1428550	1428550		34486	1251210	1285696	

DEPRECIATION FOR THE YEAR 2022-23 | MERC ORDER : LIFE 17 YEARS | LIFE : 40 YRS. | RATE OF DEP.: 2.25 %

CABLE AND MAINS

FROM 2011-12 | FROM 1994-95 : LIFE 35 YRS | RATE OF DEP.: 2.57 %

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2021	IDC	WRITE OFF DURING THE YEAR	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	9	11	12	13	14	15	16	17	18	
				(7-8-9-/+10)			(11-12-13)		(14*15)		(16+17)	
1970	0	0	0	0	0	0	0	2.25%	0	0	0	#DIV/0!
1971	10913649	0	1.1E+07	0	0	0	0	2.25%	0	0	0	#DIV/0!
1972	9554388	0	292225	9262163	0	0	9262163	2.25%	0	8335946	8335946	90
1973	8388173	0	0	8388173	0	0	8388173	2.25%	0	7549356	7549356	90
1974	9775861	0	0	9775861	0	0	9775861	2.25%	0	8798275	8798275	90
1975	11717400	0	0	11717400	0	0	11717400	2.25%	0	10545660	10545660	90
1976	12169915	0	0	12169915	0	0	12169915	2.25%	0	10952924	10952924	90
1977	10555702	0	0	10555702	0	0	10555702	2.25%	0	9500132	9500132	90
1978	15618582	0	0	15618582	0	0	15618582	2.25%	0	14056724	14056724	90
1979	16167097	0	0	16167097	0	0	16167097	2.25%	0	14550387	14550387	90
1980	17141932	0	0	17141932	0	0	17141932	2.25%	0	15427739	15427739	90
1981	38669778	0	0	38669778	0	0	38669778	5.28%	0	34802800	34802800	90
1982	20135132	0	0	20135132	0	0	20135132	5.28%	0	18121619	18121619	90
1983	32013692	0	0	32013692	0	0	32013692	5.28%	0	28812323	28812323	90
1984	56205363	0	0	56205363	0	0	56205363	5.28%	0	50584827	50584827	90
1985	20951406	0	0	20951406	0	0	20951406	5.28%	0	18856265	18856265	90
1986	25666672	0	0	25666672	0	0	25666672	5.28%	0	23100005	23100005	90
1987	29320556	0	0	29320556	0	0	29320556	5.28%	0	26388500	26388500	90
1988	42934990	0	0	42934990	0	0	42934990	5.28%	0	38641490	38641490	90
1989	51170798	0	0	51170798	0	0	51170798	5.28%	0	46053718	46053718	90
1990	112338620	0	0	112338620	0	0	112338620	5.28%	0	101104758	101104758	90
1991	117991103	0	0	117991103	0	0	117991103	5.28%	0	106191993	106191993	90
1992	161085823	0	0	161085823	0	0	161085823	5.28%	0	144977241	144977241	90
1993	188440938	0	0	188440938	0	0	188440938	5.28%	0	169596844	169596844	90
1994	103116417	0	0	103116417	0	0	103116417	5.28%	0	92804775	92804775	90
1995	136271320	0	0	136271320	0	0	136271320	5.28%	0	122644188	122644188	90
1996	165331500	0	0	165331500	0	0	165331500	5.28%	0	148798350	148798350	90
1997	133851938	0	0	133851938	0	0	133851938	5.28%	0	120466744	120466744	90
1998	180219938	0	0	180219938	0	0	180219938	5.28%	2198683	159999261	162197944	90
1999	199606604	0	0	199606604	0	0	199606604	5.28%	7565090	172080853	179645943	90
2000	185817677	0	0	185817677	0	0	185817677	5.28%	9811173	155417905	165229078	89
2001	231338388	0	0	231338388	0	0	231338388	5.28%	12214667	187546031	199760698	86
2002	134074537	0	0	134074537	0	0	134074537	5.28%	7079136	105248512	112327647	84
2003	137624296	0	0	137624296	24900000	0	112724296	5.28%	5951843	85591558	91543401	81
2004	147542001	0	0	147542001	45000000	0	102542001	5.28%	5414218	75224812	80639030	79
2005	189880044	0	0	189880044	30478000	31203547	128198497	5.28%	6768881	90751716	97520597	76
2006	185714645	0	0	185714645	52500000	63603184	69611461	5.28%	3675485	47488939	51164424	74
2007	328836997	0	0	328836997	0	87843484	240993513	5.28%	12724457	158212241	170936699	71
2008	339749784	0	0	339749784	14500000	97282148	227967636	5.28%	12036691	143801985	155838676	68
2009	633684236	0	0	633684236	7700000	111065274	514918962	5.28%	27187721	311577464	338765185	66
2010	648019778	0	0	648019778	0	95892048	552127730	5.28%	29152344	319902807	349055151	63
2011	547276581	0	0	547276581	0	77752227	469524354	5.28%	24790886	247908859	272699745	58
2012	437999829	0	0	437999829	0	83678305	354321524	5.28%	18708176	168373588	187081765	53
2013	454864867	0	0	454864867	0	82438615	372426252	5.28%	19664106	157312849	176976955	48
2014	760370625	0	0	760370625	0	97996029	662374596	5.28%	34973379	244813651	279787029	42
2015	630618543	0	0	630618543	0	100652529	529966014	5.28%	27982206	167893233	195875439	37
2016	612149371	0	0	612149371	0	100566763	511582608	5.28%	27011562	135057808	162069370	32
2017	433581675	0	0	433581675	0	121227194	312354481	5.28%	16492317	65969266	82461583	26
2018	860376873	0	0	860376873	95036460	106947375	658393037	5.28%	34763152	104289457	139052610	21
2019	869730250	0	0	869730250	114865195	77581531	677283524	5.28%	35760570	71521141	107281711	16
2020	768300622	0	0	768300622	0	60924424	707376198	5.28%	37349463	37349463	74698927	11
2021	525903198	11871	0	525915069	0	77143777	448771292	5.28%	23695124	0	23695124	5
TOTAL :	12000780104	11871	1.1E+07	11989586101	384979655	1473798454	10130807992		442971330	4804996981	5247968311	

DEPRECIATION FOR THE YEAR 2022-23 MERC ORDER: LIFE 17 LIFE : 20 YEARS RATE OF DEP.: 4.50 %

DISTRIBUTION PILLARS

FROM 2011-12

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	12	14	15	16	17	18	
			(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1989	0	0	0	0	0	4.50%	0	0	0	#DIV/0!
1990	1893390	33500	1859890	0	1859890	4.50%	0	1673901	1673901	90
1991	1633534	123200	1510334	0	1510334	4.50%	0	1359301	1359301	90
1992	1917274	78110	1839164	0	1839164	4.50%	0	1655248	1655248	90
1993	2798122	180800	2617322	0	2617322	4.50%	0	2355590	2355590	90
1994	2002245	64800	1937445	0	1937445	4.50%	0	1743701	1743701	90
1995	2621117	140700	2480417	0	2480417	4.50%	0	2232375	2232375	90
1996	4138267	241300	3896967	0	3896967	4.50%	0	3507270	3507270	90
1997	3793072	224200	3568872	0	3568872	5.28%	0	3211985	3211985	90
1998	5396660	133460	5263200	0	5263200	5.28%	0	4736880	4736880	90
1999	5757636	733640	5023996	0	5023996	5.28%	0	4521596	4521596	90
2000	9069959	117920	8952039	0	8952039	5.28%	0	8056835	8056835	90
2001	11057645	11960	11045685	0	11045685	5.28%	0	9941117	9941117	90
2002	10466677	203120	10263557	0	10263557	5.28%	0	9237202	9237202	90
2003	14232814	5700	14227114	0	14227114	5.28%	0	12804403	12804403	90
2004	14645059	74700	14570359	0	14570359	5.28%	174844	12938478	13113322	90
2005	10047180	23000	10024180	2177000	7847180	5.28%	414331	6615173	7029504	90
2006	12889540	20800	12868740	5000000	7868740	5.28%	415469	6279255	6694724	85
2007	16596214	21400	16574814	0	16574814	5.28%	875150	12480835	13355985	81
2008	13399882	21600	13378282	0	13378282	5.28%	706373	9471824	10178197	76
2009	17678694	6020	17672674	0	17672674	5.28%	933117	11716983	12650100	72
2010	10932739	0	10932739	0	10932739	5.28%	577249	6756433	7333681	67
2011	35492854	0	35492854	0	35492854	5.28%	1874023	18740227	20614249	58
2012	22743279	0	22743279	0	22743279	5.28%	1200845	10807606	12008451	53
2013	15964974	0	15964974	0	15964974	5.28%	842951	6743605	7586556	48
2014	15629790	0	15629790	0	15629790	5.28%	825253	5776770	6602023	42
2015	16483950	0	16483950	0	16483950	5.28%	870353	5222115	6092468	37
2016	18620147	0	18620147	0	18620147	5.28%	983144	4915719	5898862	32
2017	16764406	0	16764406	0	16764406	5.28%	885161	3540643	4425803	26
2018	22435692	0	22435692	0	22435692	5.28%	1184605	3553814	4738418	21
2019	17805956	0	17805956	924520	16881436	5.28%	891340	1782680	2674019	16
2020	18179881	0	18179881	0	18179881	5.28%	959898	959898	1919795	11
2021	24422597	0	24422597	0	24422597	5.28%	0	959898	959898	4
TOTAL :	397511245	2459930	395051315	8101520	386949795		14614104	196299356	210913460	

DEPRECIATION FOR THE MERC ORDER : LIFE 17 YEARS LIFE : 15 YEARS RATE OF DEP.: 6 %

STREET LIGHTII FROM 2011-12

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2022-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDE D UP TO 2022-23
1	7	11	12	14	15	16	17	18	
		(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1971	375761	375761	0	375761	6%	0	338185	338185	90
1972	1177831	1177831	0	1177831	6%	0	1060048	1060048	90
1973	850089	850089	0	850089	6%	0	765080	765080	90
1974	1567871	1567871	0	1567871	6%	0	1411084	1411084	90
1975	1299075	1299075	0	1299075	6%	0	1169168	1169168	90
1976	2212095	2212095	0	2212095	6%	0	1990886	1990886	90
1977	1602022	1602022	0	1602022	6%	0	1441820	1441820	90
1978	1525598	1525598	0	1525598	6%	0	1373038	1373038	90
1979	2499870	2499870	0	2499870	6%	0	2249883	2249883	90
1980	2002230	2002230	0	2002230	6%	0	1802007	1802007	90
1981	2051265	2051265	0	2051265	6%	0	1846139	1846139	90
1982	1782839	1782839	0	1782839	6%	0	1604555	1604555	90
1983	3226813	3226813	0	3226813	6%	0	2904132	2904132	90
1984	707349	707349	0	707349	6%	0	636614	636614	90
1985	2274839	2274839	0	2274839	6%	0	2047355	2047355	90
1986	3203576	3203576	0	3203576	6%	0	2883218	2883218	90
1987	1281264	1281264	0	1281264	6%	0	1153138	1153138	90
1988	1490104	1490104	0	1490104	6%	0	1341094	1341094	90
1989	1678337	1678337	0	1678337	6%	0	1510503	1510503	90
1990	2508215	2508215	0	2508215	6%	0	2257394	2257394	90
1991	1436087	1436087	0	1436087	6%	0	1292478	1292478	90
1992	11847318	11847318	0	11847318	6%	0	10662586	10662586	90
1993	13353615	13353615	0	13353615	6%	0	12018254	12018254	90
1994	14030878	14030878	0	14030878	6%	0	12627790	12627790	90
1995	19405026	19405026	0	19405026	6%	0	17464523	17464523	90
1996	9675990	9675990	0	9675990	6%	0	8708391	8708391	90
1997	35435043	35435043	0	35435043	6%	0	31891539	31891539	90
1998	46681393	46681393	0	46681393	6%	0	42013254	42013254	90
1999	20891589	20891589	0	20891589	6%	0	18802430	18802430	90
2000	24031153	24031153	0	24031153	6%	0	21628038	21628038	90
2001	34093868	34093868	0	34093868	5.28%	0	30684481	30684481	90
2002	48386819	48386819	0	48386819	5.28%	0	43548137	43548137	90
2003	18891836	18891836	0	18891836	5.28%	0	17002652	17002652	90
2004	29098079	29098079	0	29098079	5.28%	0	26188272	26188272	90
2005	11575967	11575967	0	11575967	5.28%	0	10418371	10418371	90
2006	10808482	10808482	0	10808482	5.28%	129702	9597932	9727634	90
2007	3051851	3051851	0	3051851	5.28%	161138	2526933	2688070	88
2008	7663048	7663048	0	7663048	5.28%	404609	5885221	6289830	82
2009	13592326	13592326	0	13592326	5.28%	717675	9623367	10341042	76
2010	16304978	16304978	0	16304978	5.28%	860903	10565626	11426529	70
2011	16338193	16338193	0	16338193	5.28%	862657	8626566	9489222	58
2012	7088085	7088085	0	7088085	5.28%	374251	3368258	3742509	53
2013	5556338	5556338	0	5556338	5.28%	293375	2346997	2640372	48
2014	48578223	48578223	0	48578223	5.28%	2564930	17954511	20519441	42
2015	15569846	15569846	0	15569846	5.28%	822088	4932527	5754615	37
2016	18235339	18235339	0	18235339	5.28%	962826	4814129	5776955	32
2017	18077317	18077317	0	18077317	5.28%	954482	3817929	4772412	26
2018	368275181	368275181	73815497	294459684	5.28%	15547471	46642414	62189885	21
2019	553783762	553783762	185730094	368053668	5.28%	19433234	38866467	58299701	16
2020	49874571	49874571	0	49874571	5.28%	2633377	2633377	5266755	11
2021	95876543	95876543	0	95876543	5.28%	5062281	0	5062281	5
TOTAL :	1622825786	1622825786	259545591	1363280195		51784998	508938789	560723787	

DEPRECIATION FOR THE YEAR 2022- MERC ORDER : LIFE 17 YEARS LIFE : 15 YEARS RATE OF DEP.: 6 %

METERS (CONVENTIO FROM 2011-12

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	12	14	15	16	17	18	
			(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1994	0	0	0	0	0	6%	0	0	0	#DIV/0!
1995	0	0	0	0	0	6%	0	0	0	0
1996	0	0	0	0	0	6%	0	0	0	#DIV/0!
1997	14207453	14207453	0	0	0	6%	0	-1	-1	0
1998	37099005	37099005	0	0	0	6%	0	0	0	#DIV/0!
1999	39168909	7329830	31839079	0	31839079	6%	0	28655171	28655171	90
2000	45007000	0	45007000	0	45007000	6%	0	40506300	40506300	90
2001	49820192	0	49820192	0	49820192	5.28%	0	44838173	44838173	90
2002	26588512	0	26588512	0	26588512	5.28%	0	23929660	23929660	90
2003	45752708	0	45752708	8200000	37552708	5.28%	0	33797437	33797437	90
2004	26813967	0	26813967	8200000	18613967	5.28%	0	16752570	16752570	90
2005	33382472	0	33382472	7075000	26307472	5.28%	0	23676725	23676725	90
2006	52581078	0	52581078	23750000	28831078	5.28%	345973	25601997	25947970	90
2007	28461442	0	28461442	0	28461442	5.28%	1502764	23566074	25068838	88
2008	14912906	0	14912906	3000000	11912906	5.28%	629001	9149112	9778113	82
2009	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	413795644	58636288	355159356	50225000	304934356		2477739	270473219	272950958	

DEPRECIATION FOR THE YEAR 2022-23 MERC ORDER : LIFE 8 YEARS LIFE : 15 YEARS RATE OF DEP.: 6 %

METERS (ELECTRONIC)

FROM 2011-12 22-23 LIFE 10 YRS RATE OF DEP. : 9%

RATE OF DEP : 11.25 %

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	12	14	15	16	17	18	
			(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
2000	0	0	0	0	0	6%	0	0	0	0
2001	34082874	10061253	24021622	0	24021622	11.25%	0	21619460	21619460	90
2002	48063259	7807812	40255448	0	40255448	11.25%	0	36229902	36229902	90
2003	15300374	5118809	10181565	12800000	-2618435	11.25%	0	-2356591	-2356591	90
2004	50587402	0	50587402	25600000	24987402	11.25%	0	22488661	22488661	90
2005	15932540	696439	15236100	7075000	8161100	11.25%	0	7344991	7344991	90
2006	17442783	3613613	13829170	23750000	-9920830	11.25%	0	-8928746	-8928746	90
2007	6210365	55484	6154881	0	6154881	11.25%	0	5539392	5539392	90
2008	9139660	6263213	2876447	3000000	-123553	11.25%	0	-111199	-111199	90
2009	24662746	10287299	14375447	2000000	12375447	11.25%	0	11137902	11137902	90
2010	41839260	5508347	36330913	0	36330913	11.25%	0	32697822	32697822	90
2011	0	0	0	0	0	11.25%	0	0	0	90
2012	142215311	26354905	115860406	0	115860406	11.25%	0	104274365	104274365	90
2013	96385159	21165	96363994	0	96363994	11.25%	0	86727595	86727595	90
2014	117592914	7644900	109948014	0	109948014	11.25%	12369152	86584061	98953213	90
2015	73930862	1392829	72538033	0	72538033	11.25%	8160529	48963173	57123702	79
2016	94246678	1475007	92771671	0	92771671	11.25%	10436813	52184065	62620878	68
2017	98840358	162300	98678058	0	98678058	11.25%	11101282	44405126	55506408	56
2018	122375176	342770	122032406	41720343	80312063	11.25%	9035107	27105321	36140428	45
2019	179173788	377478	178796310	32942044	145854266	11.25%	16408605	32817210	49225815	34
2020	62960296	0	62960296	0	62960296	11.25%	7083033	7083033	14166067	23
2021	146232442	0	146232442	0	146232442	9.00%	13160920	0	13160920	9
TOTAL :	1397214247	87183623	1310030624	148887387	1161143237		87755440	615805542	703560982	

DEPRECIATION FOR THE YEAR 20222 MERC ORDER LIFE : 6 YEARS RATE OF DEP.: 15 %

BUSINESS PROCESS AUTOMATION

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISI ON FOR YEAR 2022-23	CUMM.DE P. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 20222-23	TOTAL % OF DEP PROVIDE D UP TO 2022-23
1	7	11	12	14	15	16	17	18	
		(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
2010	316100000	316100000	0	316100000	15%	0	284490000	284490000	90
2011	39532722	39532722	0	39532722	15%	0	35579450	35579450	90
2012	64685052	64685052	0	64685052	15%	0	58216547	58216547	90
2013	60000000	60000000	0	60000000	15%	0	54000000	54000000	90
2014	0	0	0	0	15%	0	0	0	#DIV/0!
2015	8342289	8342289	0	8342289	15%	0	7508060	7508060	90
2016	187500	187500	0	187500	15%	28125	140625	168750	90
2017	75000	75000	0	75000	15%	11250	45000	56250	75
2018	1754025	1754025	0	1754025	15%	263104	789311	1052415	60
2019	1017066	1017066	0	1017066	15%	152560	305120	457680	45
2020	3875066	3875066	0	3875066	15%	581260	581260	1162520	30
2021	4764983	4764983	0	4764983	15%	714747	0	714747	15
TOTAL :	500333703	500333703	0	500333703		1751046	441655373	443406419	

DEPRECIATION FOR THE YEAR 2022-23 FROM 1994-95 LIFE : 25 YEARS PAST : 1947 LIFE : 20 YEARS

SWITCHGEARS

RATE OF DEP : 3.60% RATE OF DEP : 4.50 %

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	12	14	15	16	17	18	
			(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1966	2178431	0	2178431	0	2178431	4.50%	0	1960587	1960587	90
1967	1458243	11041	1447202	0	1447202	4.50%	0	1302482	1302482	90
1968	2800556	0	2800556	0	2800556	4.50%	0	2520500	2520500	90
1969	1810513	0	1810513	0	1810513	4.50%	0	1629462	1629462	90
1970	771699	0	771699	0	771699	4.50%	0	694529	694529	90
1971	987179	0	987179	0	987179	4.50%	0	888461	888461	90
1972	5525257	0	5525257	0	5525257	4.50%	0	4972732	4972732	90
1973	959253	4782	954472	0	954472	4.50%	0	859024	859024	90
1974	2449570	0	2449570	0	2449570	4.50%	0	2204613	2204613	90
1975	4836088	0	4836088	0	4836088	4.50%	0	4352479	4352479	90
1976	3341126	0	3341126	0	3341126	4.50%	0	3007014	3007014	90
1977	1161983	0	1161983	0	1161983	4.50%	0	1045785	1045785	90
1978	1167912	0	1167912	0	1167912	4.50%	0	1051121	1051121	90
1979	1100156	0	1100156	0	1100156	4.50%	0	990140	990140	90
1980	295799	0	295799	0	295799	4.50%	0	266216	266216	90
1981	5306352	0	5306352	0	5306352	4.50%	0	4775717	4775717	90
1982	5448053	79202	5368852	0	5368852	4.50%	0	4831966	4831966	90
1983	2994507	0	2994507	0	2994507	4.50%	0	2695057	2695057	90
1984	12601217	0	12601217	0	12601217	4.50%	0	11341096	11341096	90
1985	24498309	0	24498309	0	24498309	4.50%	0	22048478	22048478	90
1986	14049383	0	14049383	0	14049383	4.50%	0	12644445	12644445	90
1987	52050932	0	52050932	0	52050932	4.50%	0	46845839	46845839	90
1988	84562060	0	84562060	0	84562060	4.50%	0	76105854	76105854	90
1989	78131801	44158	78087644	0	78087644	4.50%	0	70278879	70278879	90
1990	48831730	303251	48528479	0	48528479	4.50%	0	43675631	43675631	90
1991	104264404	0	104264404	0	104264404	4.50%	0	93837964	93837964	90
1992	146276966	572376	145704590	0	145704590	4.50%	0	131134132	131134132	90
1993	178461846	2174407	176287439	0	176287439	4.50%	0	158658695	158658695	90
1994	186726970	662400	186064570	0	186064570	5.28%	0	167458112	167458112	90
1995	113316307	1542537	111773770	0	111773770	5.28%	0	100596393	100596393	90
1996	95894698	794709	95099988	0	95099988	5.28%	0	85589990	85589990	90
1997	98174235	530570	97643665	0	97643665	5.28%	0	87879299	87879299	90
1998	409380606	898695	408481911	0	408481911	5.28%	0	367633719	367633719	90
1999	144725536	0	144725536	0	144725536	5.28%	0	130252983	130252983	90
2000	51997151	152595	51844556	0	51844556	5.28%	0	46660100	46660100	90
2001	61263867	661407	60602460	0	60602460	5.28%	0	54542214	54542214	90
2002	88881350	1939143	86942207	0	86942207	5.28%	1043306	77204680	78247986	90
2003	179329147	392700	178936447	32700000	146236447	5.28%	7019349	124593453	131612802	90
2004	185534563	540500	184994063	57000000	127994063	5.28%	6758087	104443155	111201242	87
2005	210478018	0	210478018	41363000	169115018	5.28%	8929273	131909714	140838987	83
2006	207472113	310665	207161448	90000000	117161448	5.28%	6186124	87168117	93354242	80
2007	473416210	1697918	471718292	600000	471118292	5.28%	24875046	333551751	358426797	76
2008	384874536	3571991	381302545	16700000	364602545	5.28%	19251014	245012910	264263924	72
2009	218271780	0	218271780	2700000	215571780	5.28%	11382190	137103652	148485842	69
2010	328175487	0	328175487	0	328175487	5.28%	17327666	196905292	214232958	65
2011	227716134	0	227716134	0	227716134	5.28%	12023412	120234119	132257531	58
2012	136268674	0	136268674	0	136268674	5.28%	7194986	64754874	71949860	53
2013	168787484	0	168787484	0	168787484	5.28%	8911979	71295833	80207812	48
2014	228701478	0	228701478	0	228701478	5.28%	12075438	84528066	96603504	42
2015	189884676	0	189884676	0	189884676	5.28%	10025911	60155465	70181376	37
2016	231221455	0	231221455	0	231221455	5.28%	12208493	61042464	73250957	32
2017	173331522	0	173331522	0	173331522	5.28%	9151904	36607617	45759522	26
2018	224297319	0	224297319	0	224297319	5.28%	11842898	35528695	47371594	21
2019	323664652	0	323664652	70539232	253125420	5.28%	13365022	26730044	40095067	16
2020	189533998	0	189533998	0	189533998	5.28%	10007395	10007395	20014790	11
2021	188970073	0	189069147	0	189069147	5.28%	9982851	0	9982851	5
TOTAL :	6508611364	16885046	6491825392	311602232	6180223160		219562345	3756009003	3975571348	

DEPRECIATION FOR THE YEAR 2022-23

PAST : 1947 LIFE : 35 YEARS

TRANSFORMER

RATE OF DEP : 2.57 %

FROM 1994-95 LIFE : 25 YEARS RATE OF DEP : 3.60%

YEAR	BOOK VALUE AS ON 01.04.2021	IDC	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	9	11	12	14	15	16	17	18	
				(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1948	118043	0	0	118043	0	118043	2.57%	0	106239	106239	90
1949	393459	0	0	393459	0	393459	2.57%	0	354113	354113	90
1950	35070	0	0	35070	0	35070	2.57%	0	31563	31563	90
1951	116886	0	0	116886	0	116886	2.57%	0	105197	105197	90
1952	77694	0	0	77694	0	77694	2.57%	0	69925	69925	90
1953	374990	0	0	374990	0	374990	2.57%	0	337491	337491	90
1954	22531	0	0	22531	0	22531	2.57%	0	20278	20278	90
1955	-2211537	0	0	-2211537	0	-2211537	2.57%	0	-1990383	-1990383	90
1956	0	0	0	0	0	0	2.57%	0	0	0	#DIV/0!
1957	364808	0	0	364808	0	364808	2.57%	0	328327	328327	90
1958	-756981	0	0	-756981	0	-756981	2.57%	0	-681283	-681283	90
1959	52171	0	0	52171	0	52171	2.57%	0	46954	46954	90
1960	1139739	0	0	1139739	0	1139739	2.57%	0	1025765	1025765	90
1961	-2599572	0	0	-2599572	0	-2599572	2.57%	0	-2339615	-2339615	90
1962	141426	0	0	141426	0	141426	2.57%	0	127283	127283	90
1963	183135	0	22950	160185	0	160185	2.57%	0	144167	144167	90
1964	114126	0	0	114126	0	114126	2.57%	0	102713	102713	90
1965	-183484	0	0	-183484	0	-183484	2.57%	0	-165136	-165136	90
1966	309882	0	0	309882	0	309882	2.57%	0	278894	278894	90
1967	686285	0	0	686285	0	686285	2.57%	0	617656	617656	90
1968	1351913	0	26200	1325713	0	1325713	2.57%	0	1193142	1193142	90
1969	1380151	0	0	1380151	0	1380151	2.57%	0	1242136	1242136	90
1970	115387	0	0	115387	0	115387	2.57%	0	103848	103848	90
1971	670727	0	0	670727	0	670727	2.57%	0	603655	603655	90
1972	307610	0	0	307610	0	307610	2.57%	0	276849	276849	90
1973	0	0	0	0	0	0	2.57%	0	0	0	0
1974	1369818	0	0	1369818	0	1369818	2.57%	0	1232836	1232836	90
1975	1344384	0	0	1344384	0	1344384	2.57%	0	1209946	1209946	90
1976	470	0	0	470	0	470	2.57%	0	423	423	90
1977	365036	0	0	365036	0	365036	2.57%	0	328533	328533	90
1978	1300129	0	0	1300129	0	1300129	2.57%	0	1170116	1170116	90
1979	413420	0	163172	250247	0	250247	2.57%	0	225223	225223	90
1980	0	0	0	0	0	0	2.57%	0	0	0	#DIV/0!
1981	8062616	0	191099	7871517	0	7871517	2.57%	0	7084365	7084365	90
1982	5664139	0	0	5664139	0	5664139	2.57%	0	5097728	5097728	90
1983	3563945	0	285526	3278419	0	3278419	2.57%	0	2950577	2950577	90
1984	2304248	0	70465	2233783	0	2233783	2.57%	0	2010404	2010404	90
1985	3593436	0	0	3593436	0	3593436	5.28%	0	3234092	3234092	90
1986	7129357	0	80165	7049192	0	7049192	5.28%	0	6344273	6344273	90
1987	3653031	0	0	3653031	0	3653031	5.28%	0	3287728	3287728	90
1988	1693695	0	1357318	336377	0	336377	5.28%	0	302739	302739	90
1989	18334541	0	243800	18090741	0	18090741	5.28%	0	16281667	16281667	90
1990	23967558	0	503000	23464558	0	23464558	5.28%	0	21118102	21118102	90
1991	11127540	0	209273	10918268	0	10918268	5.28%	0	9826441	9826441	90
1992	64079744	0	2280246	61799498	0	61799498	5.28%	0	55619549	55619549	90
1993	65036653	0	1262700	63773953	0	63773953	5.28%	0	57396557	57396557	90
1994	40619896	0	617618	40002278	0	40002278	5.28%	0	36002050	36002050	90
1995	32322691	0	0	32322691	0	32322691	5.28%	0	29090422	29090422	90
1996	216504197	0	1149503	215354695	0	215354695	5.28%	0	193819225	193819225	90
1997	130511568	0	1144860	129366708	0	129366708	5.28%	0	116430037	116430037	90
1998	209522333	0	0	209522333	0	209522333	5.28%	0	188570100	188570100	90
1999	103861998	0	0	103861998	0	103861998	5.28%	0	93475798	93475798	90
2000	75399236	0	939800	74459436	0	74459436	5.28%	0	67013492	67013492	90
2001	88882526	0	1597990	87284536	0	87284536	5.28%	0	78556083	78556083	90
2002	106219852	0	1276277	104943575	0	104943575	5.28%	1259323	93189895	94449218	90
2003	64501802	0	0	64501802	11800000	52701802	5.28%	2529686	44901935	47431622	90
2004	146735900	0	0	146735900	44800000	101935900	5.28%	5382216	83179694	88561910	87
2005	102367262	0	619900	101747362	20681500	81065862	5.28%	4280278	63231372	67511650	83
2006	128614466	0	0	128614466	55000000	73614466	5.28%	3886844	54769163	58656007	80
2007	445257553	0	0	445257553	600000	444657553	5.28%	23477919	314817548	338295466	76
2008	246928535	0	0	246928535	10700000	236228535	5.28%	12472867	158745576	171218442	72
2009	178813794	0	0	178813794	2200000	176613794	5.28%	9325208	112326373	121651581	69
2010	255598811	0	0	255598811	0	255598811	5.28%	13495617	153359287	166854904	65
2011	111382068	0	0	111382068	0	111382068	5.28%	5880973	58809732	64690705	58
2012	166905888	0	0	166905888	0	166905888	5.28%	8812631	79313678	88126309	53
2013	139163531	0	0	139163531	0	139163531	5.28%	7347834	58782675	66130510	48
2014	256664275	0	0	256664275	0	256664275	5.28%	13551874	94863116	108414990	42
2015	220889720	0	0	220889720	0	220889720	5.28%	11662977	69977863	81640841	37
2016	107130646	0	0	107130646	0	107130646	5.28%	5656498	28282491	33938989	32
2017	126712854	0	0	126712854	0	126712854	5.28%	6690439	26761755	33452193	26
2018	253396310	0	0	253396310	53143197	200253113	5.28%	10573364	31720093	42293457	21
2019	429539880	0	0	429539880	155875654	273664226	5.28%	14449471	28898942	43348413	16
2020	171989719	0	0	171989719	0	171989719	5.28%	9081057	9081057	18162114	11
2021	144821916	99273	0	144921189	0	144921189	5.28%	7651839	0	7651839	5
TOTAL :	4926467446	99273	14041861	4912524858	354800351	4557724507		177468915	2564630532	2742099446	

DEPRECIATION FOR THE YEAR 2022 MERC ORDER : LIFE 6 YEARS LIFE : 12 YEARS

SCADA

FROM 2011-12 RATE OF DEP :7.50%

RATE OF DEP : 15 %

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISI ON FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDE D UP TO 2022-23
1	7	11	12	14	15	16	17	18	
		(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
2001	113465411	113465411	0	113465411	7.50%	0	102118870	102118870	90
2002	42372935	42372935	0	42372935	7.50%	0	38135642	38135642	90
2003	0	0	0	0	15%	0	0	0	#DIV/0!
2004	0	0	0	0	15%	0	0	0	#DIV/0!
2005	0	0	0	0	15%	0	0	0	#DIV/0!
2006	0	0	0	0	15%	0	0	0	#DIV/0!
2007	0	0	0	0	15%	0	0	0	#DIV/0!
2008	0	0	0	0	15%	0	0	0	#DIV/0!
2009	15597509	15597509	0	15597509	15%	0	14037758	14037758	90
2010	29964040	29964040	0	29964040	15%	0	26967636	26967636	90
2011	6575457	6575457	0	6575457	15%	0	5917911	5917911	90
2012	174384544	174384544	0	174384544	15%	0	156946090	156946090	90
2013	600000	600000	0	600000	15%	0	540000	540000	90
2014	25090125	25090125	0	25090125	15%	0	22581113	22581113	90
2015	8297243	8297243	0	8297243	15%	0	7467519	7467519	90
2016	21909143	21909143	0	21909143	15%	3286372	16431858	19718229	90
2017	19953228	19953228	0	19953228	15%	2992984	11971937	14964921	75
2018	0	0	0	0	15%	0	0	0	#DIV/0!
2019	-89586	-89586	0	-89586	15%	-13438	-26876	-40314	45
2020	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	458120050	458120050	0	458120050		6265918	403089457	409355375	

DEPRECIATION FOR THE YEAR 2022-23 LIFE : 10 YEARS

BATTERIES

22-23 RATE OF DEP : 9 %

18% FROM 1994-95 LIFE : 5 YEARS RATE OF DEP : 18%

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM. DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	12	14	15	16	17	18	
			(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1989	2055	0	2055	0	2055	9%	0	1850	1850	90
1990	428864	0	428864	0	428864	9%	0	385978	385978	90
1991	0	0	0	0	0	9%	0	0	0	#DIV/0!
1992	395	0	395	0	395	9%	0	356	356	90
1993	106722	0	106722	0	106722	9%	0	96050	96050	90
1994	0	0	0	0	0	18%	0	0	0	#DIV/0!
1995	607422.25	0	607422	0	607422	18%	0	546680	546680	90
1996	44570	0	44570	0	44570	18%	0	40113	40113	90
1997	390674	0	390674	0	390674	18%	0	351607	351607	90
1998	371549	0	371549	0	371549	18%	0	334394	334394	90
1999	4921	0	4921	0	4921	18%	0	4429	4429	90
2000	1282890	0	1282890	0	1282890	18%	0	1154601	1154601	90
2001	6654785	293120	6361665	0	6361665	18%	0	5725499	5725499	90
2002	510007	149058	360950	0	360950	18%	0	324855	324855	90
2003	1847699.5	0	1847700	0	1847700	18%	0	1662930	1662930	90
2004	3159591	0	3159591	0	3159591	18%	0	2843632	2843632	90
2005	1881947	0	1881947	0	1881947	18%	0	1693752	1693752	90
2006	4003238	144063	3859176	0	3859176	18%	0	3473258	3473258	90
2007	2728145	0	2728145	0	2728145	18%	0	2455331	2455331	90
2008	643820	0	643820	0	643820	18%	0	579438	579438	90
2009	401150	0	401150	0	401150	5.28%	0	361035	361035	90
2010	8941196	0	8941196	0	8941196	5.28%	107294	7939782	8047076	90
2011	7142155	0	7142155	0	7142155	5.28%	377106	3771058	4148164	58
2012	9167826	230000	8937826	0	8937826	5.28%	471917	4247255	4719172	53
2013	5932726	0	5932726	0	5932726	5.28%	313248	2505983	2819231	48
2014	15654021	0	15654021	0	15654021	5.28%	826532	5785726	6612258	42
2015	11613220	0	11613220	0	11613220	5.28%	613178	3679068	4292246	37
2016	3822093	0	3822093	0	3822093	5.28%	201807	1009033	1210839	32
2017	6303908	0	6303908	0	6303908	5.28%	332846	1331385	1664232	26
2018	1442032	0	1442032	0	1442032	5.28%	76139	228418	304557	21
2019	14400851	0	14400851	150851	14250000	5.28%	752400	1504800	2257200	16
2020	9009137	0	9009137	0	9009137	5.28%	475682	475682	951365	11
2021	13299583	0	13299583	0	13299583	18.00%	2393925	0	2393925	18
TOTAL :	131799193	816240	130982953	150851	130832102		6942075	#######	#######	

DEPRECIATION FOR THE YEAR 202 MERC ORDER : LIFE 17 YEARS LIFE : 10 YEARS

CAPACITORS

FROM 2011-12 RATE OF DEP :9 %

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2021	IDC	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISI ON FOR YEAR 2022-23	CUMM.D EP. PROVIDE D UPTO 2021-22	CUMM. DEP. PROVIDE D UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	11	12	14	15	16	17	18	
			(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
2001	0	0	0	0	0	9%	0	0	0	0
2002	3245920	0	3245920	0	3245920	9%	0	2921328	2921328	90
2003	4721610.8	0	4721611	0	4721611	9%	0	4249450	4249450	90
2004	14502387	0	14502387	0	14502387	9%	0	#######	#######	90
2005	647939	0	647939	0	647939	5.28%	0	583145	583145	90
2006	11319	0	11319	0	11319	5.28%	0	10187	10187	90
2007	19009834	0	19009834	0	19009834	5.28%	0	#######	#######	90
2008	3976507	0	3976507	0	3976507	5.28%	47718	3531138	3578856	90
2009	3156963	0	3156963	0	3156963	5.28%	166688	2519256	2685944	85
2010	16089136	0	16089136	0	16089136	5.28%	849506	#######	#######	76
2011	16316545	0	16316545	0	16316545	5.28%	861514	8615136	9476649	58
2012	6136188	0	6136188	0	6136188	5.28%	323991	2915916	3239907	53
2013	6053230	0	6053230	0	6053230	5.28%	319611	2556884	2876495	48
2014	10728845	0	10728845	0	10728845	5.28%	566483	3965381	4531864	42
2015	10432479	0	10432479	0	10432479	5.28%	550835	3305009	3855844	37
2016	17820039	0	17820039	0	17820039	5.28%	940898	4704490	5645388	32
2017	8604750	0	8604750	0	8604750	5.28%	454331	1817323	2271654	26
2018	3741572	0	3741572	0	3741572	5.28%	197555	592665	790220	21
2019	10875101	0	10875101	3615733	7259368	5.28%	383295	766589	1149884	16
2020	3326469	0	3326469	0	3326469	5.28%	175638	175638	351275	11
2021	7513342	89782	7603124	0	7603124	5.28%	401445	0	401445	5
TOTAL :	166910176	89782	166999958	3615733	163384225		6239506	#######	#######	

DEPRECIATION FOR TI MERC ORDER : LIFE 17 YEARS LIFE : 7 YEARS

D.E.A. ON HIF FROM 2011-12 RATE OF DEP : 12.86 %

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	11	12	14	15	16	17	18	
		(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1986	77814	77814	0	77814	12.86%	0	70033	70033	90
1987	0	0	0	0	12.86%	0	0	0	#DIV/0!
1988	0	0	0	0	12.86%	0	0	0	#DIV/0!
1989	176571	176571	0	176571	12.86%	0	158914	158914	90
1990	66151	66151	0	66151	12.86%	0	59536	59536	90
1991	1628	1628	0	1628	12.86%	0	1465	1465	90
1992	-814	-814	0	-814	12.86%	0	-733	-733	90
1993	1154	1154	0	1154	12.86%	0	1039	1039	90
1994	0	0	0	0	12.86%	0	0	0	#DIV/0!
1995	0	0	0	0	12.86%	0	0	0	#DIV/0!
1996	0	0	0	0	12.86%	0	0	0	#DIV/0!
1997	0	0	0	0	12.86%	0	0	0	#DIV/0!
1998	0	0	0	0	12.86%	0	0	0	#DIV/0!
1999	0	0	0	0	12.86%	0	0	0	#DIV/0!
2000	0	0	0	0	12.86%	0	0	0	#DIV/0!
2001	0	0	0	0	12.86%	0	0	0	#DIV/0!
2002	0	0	0	0	12.86%	0	0	0	#DIV/0!
2003	0	0	0	0	12.86%	0	0	0	#DIV/0!
2004	0	0	0	0	12.86%	0	0	0	#DIV/0!
2005	0	0	0	0	12.86%	0	0	0	#DIV/0!
2006	97425	97425	0	97425	12.86%	0	87683	87683	90
2007	0	0	0	0	12.86%	0	0	0	#DIV/0!
2008	0	0	0	0	12.86%	0	0	0	#DIV/0!
2009	0	0	0	0	12.86%	0	0	0	#DIV/0!
2010	0	0	0	0	12.86%	0	0	0	#DIV/0!
2011	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	419929	419929	0	419929		0	377936	377936	

DEPRECIATION FOR TH MERC ORDER : LIFE 17 YEARS LIFE : 1 YEARS

LOOSE TOOLS FROM : 2011-12 RATE OF DEP : 90 %

RATE OF DEP.: 5.28%

YEAR	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	11	14	15	16	17	18	
		(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1980	207131	207131	207131	90%	0	186418	186418	90
1981	0	0	0	90%	0	0	0	#DIV/0!
1982	5080	5080	5080	90%	0	4572	4572	90
1983	1069016	1069016	1069016	90%	0	962114	962114	90
1984	-1077774	-1077774	-1E+06	90%	0	-969997	-969997	90
1985	57103	57103	57103	90%	0	51393	51393	90
1986	16290	16290	16290	90%	0	14661	14661	90
1987	54640	54640	54640	90%	0	49176	49176	90
1988	95093	95093	95093	90%	0	85584	85584	90
1989	40883	40883	40883	90%	0	36795	36795	90
1990	94539	94539	94539	90%	0	85085	85085	90
1991	4343601	4343601	4343601	90%	0	3909241	3909241	90
1992	30747	30747	30747	90%	0	27672	27672	90
1993	-5101356	-5101356	-5E+06	90%	0	-4591220	#######	90
1994	35034	35034	35034	90%	0	31531	31531	90
1995	-68947	-68947	-68947	90%	0	-62052	-62052	90
1996	120515	120515	120515	90%	0	108464	108464	90
1997	82983	82983	82983	90%	0	74685	74685	90
1998	-72471	-72471	-72471	90%	0	-65224	-65224	90
1999	303622	303622	303622	90%	0	273260	273260	90
2000	206852	206852	206852	90%	0	186167	186167	90
2001	51500	51500	51500	90%	0	46350	46350	90
2002	393168	393168	393168	90%	0	353851	353851	90
2003	84857	84857	84857	90%	0	76371	76371	90
2004	7218	7218	7218	90%	0	6496	6496	90
2005	0	0	0	90%	0	0	0	#DIV/0!
2006	0	0	0	90%	0	0	0	#DIV/0!
2007	0	0	0	90%	0	0	0	#DIV/0!
2008	0	0	0	90%	0	0	0	#DIV/0!
2009	0	0	0	90%	0	0	0	#DIV/0!
2010	0	0	0	90%	0	0	0	#DIV/0!
2011	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	979324	979324	979324		0	881392	881392	

DEPRECIATION FOR THE YEAR 2022-23

LIFE : 10 YEARS

OFFICE EQUIPMENTS

RATE OF DEP : 9 %

FROM 1994-95 LIFE : 18 YEARS RATE OF DEP : 5%

YEAR	BOOK VALUE AS ON 01.04.2021	WRITE OFF DURING THE YEAR 2022-23	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.22	RATE OF DEP.	DEP. PROVISION FOR YEAR 2022-23	CUMM.DEP. PROVIDED UPTO 2021-22	CUMM. DEP. PROVIDED UPTO 2022-23	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	9	11	14	15	16	17	18	
			(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1981	0	0	0	0	9%	0	0	0	#DIV/0!
1982	109008	0	109008	109008	9%	0	98107	98107	90
1983	39013	0	39013	39013	9%	0	35112	35112	90
1984	32576	0	32576	32576	9%	0	29318	29318	90
1985	204157	0	204157	204157	9%	0	183741	183741	90
1986	33187.46	0	33187	33187	9%	0	29868	29868	90
1987	191169.07	0	191169	191169	9%	0	172052	172052	90
1988	948.81	0	949	949	9%	0	854	854	90
1989	0	0	0	0	9%	0	0	0	#DIV/0!
1990	0	0	0	0	9%	0	0	0	#DIV/0!
1991	110075	0	110075	110075	9%	0	99068	99068	90
1992	347849	0	347849	347849	9%	0	313064	313064	90
1993	0	0	0	0	5%	0	0	0	#DIV/0!
1994	0	0	0	0	5%	0	0	0	#DIV/0!
1995	0	0	0	0	5%	0	0	0	#DIV/0!
1996	0	0	0	0	5%	0	0	0	#DIV/0!
1997	2352	0	2352	2352	5%	0	2117	2117	90
1998	122352	0	122352	122352	6.33%	0	110117	110117	90
1999	674564.41	0	674564	674564	6.33%	0	607107	607107	90
2000	23096	0	23096	23096	6.33%	0	20787	20787	90
2001	0	0	0	0	6.33%	0	0	0	#DIV/0!
2002	2717	0	2717	2717	6.33%	0	2445	2445	90
2003	3397819	0	3397819	3397819	6.33%	0	3058037	3058037	90
2004	2544858	0	2544858	2544858	6.33%	0	2290373	2290373	90
2005	3258371	338000	2920371	2920371	6.33%	0	2628334	2628334	90
2006	410000	0	410000	410000	6.33%	0	369000	369000	90
2007	27800	0	27800	27800	6.33%	473	24547	25020	90
2008	0	0	0	0	6.33%	0	0	0	#DIV/0!
2009	1335726	0	1335726	1335726	6.33%	84551	1045873	1130425	85
2010	3156042	0	3156042	3156042	6.33%	199777	2313379	2513156	80
2011	503655	14589	489066	489066	6.33%	30958	309579	340537	70
2012	548165	0	548165	548165	6.33%	34699	312290	346988	63
2013	6550985	0	6550985	6550985	6.33%	414677	3317419	3732096	57
2014	268993	0	268993	268993	6.33%	17027	119191	136218	51
2015	181304	0	181304	181304	6.33%	11477	68859	80336	44
2016	3034985	0	3034985	3034985	6.33%	192115	960573	1152687	38
2017	0	0	0	0	6.33%	0	0	0	#DIV/0!
2018	109540	0	109540	109540	6.33%	6934	20802	27736	25
2019	0	0	0	0	6.33%	0	0	0	#DIV/0!
2020	0	0	0	0	6.33%	0	0	0	#DIV/0!
2021	34482	0	34482	34482	6.33%	2183	0	2183	6
TOTAL :	27255789	352589	26903200	26903200		994871	#######	#######	

SUMMARY OF PROVISION OF DEPRECIATION ON ASSETS OF SUPPLY DIVISION

FOR THE YEAR 2022-23

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2021	IDC	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.22	DEP. PROVISION FOR YEAR 2022-23
1	7		8	10	11	12	13	15
				(7-8-/+9)			(10-11-12)	(13*14)
LAND	22953418	0	0	22953418	0	0	22953418	0
BUILDING	824157938	0	44562	824113375	0	0	824113375	26445357
BLDG CASH COLLN PORT CWK	149466	0	0	149466	0	0	149466	4229
MOTOR VEHICLE	138266695	0	0	138266695	0	0	138266695	2824505
MACHINE TOOLS	397210517	0	396071	396814446	0	0	396814446	18158435
FURNITURE	27069470	0	3105	27066365	0	0	27066365	427957
ROOM A.C.	24661923	0	169148	24492775	0	0	24492775	996721
PERSONAL COMPUTER	190686180	0	2600445	188085735	0	0	188085735	7944019
ELECTRONIC EQUIP	5380858	0	0	5380858	0	0	5380858	163162
ELECTRONIC EQUIP SEPRATED M.T.	27419074	0	0	27419074	0	0	27419074	1556812
CYCLOSTYLE MACH	1489499	0	60949	1428550	0	0	1428550	34486
CABLE & MAINS	12000780104	11871	11205874	11989586101	384979655	1473798454	10130807992	442971330
DIST PILLARS	397511245	0	2459930	395051315	8101520	0	386949795	14614104
ST LTG LAMPS	1622825786	0	0	1622825786	259545591	0	1363280195	51784998
METERS (CONVENTIONAL)	413795644	0	58636288	355159356	50225000	0	304934356	2477739
METERS (ELECTRONICS)	1397214247	0	87183623	1310030624	148887387	0	1161143237	87755440
BUSINESS PROC AUTOMATION	500333703	0	0	500333703	0	0	500333703	1751046
SWITCHGEARS	6508611364	99074	16885046	6491825392	311602232	0	6180223160	219562345
TRANSFORMER	4926467446	99273	14041861	4912524858	354800351	0	4557724507	177468915
SCADA	458120050	0	0	458120050	0	0	458120050	6265918
BATTERIES	131799193	0	816240	130982953	150851	0	130832102	6942075
CAPACITORS	166910176	89782	0	166999958	3615733	0	163384225	6239506
DEA ON HIRE	419929	0	0	419929	0	0	419929	0
LOOSE TOOLS	979324	0	0	979324	0	0	979324	0
OFFICE EQUIPMENTS	27255789	0	352589	26903200	0	0	26903200	994871
TOTAL :	30212469039	300000	194855732	30017913307	1521908320	1473798454	27022206533	1077383968

DETAILS OF E-6 WISE ASSETS GROUPING - SUPPLY DIVISION

DEPRECITION PROVISION FOR THE YEAR 2022-23

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2021	IDC	WRITE OFF DURING THE YEAR 2021-22	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.22	DEP. PROVISION FOR YEAR 2022-23
LAND	**22953418**	**0**	**0**	**22953418**	**0**	**0**	**22953418**	**0**
BUILDING	824157938	0	44562	824113375	0	0	824113375	26445357
BLDG CASH COLL CHOK	149466	0	0	149466	0	0	149466	4229
BUILDINGS	**824307404**	**0**	**44562**	**824262841**	**0**	**0**	**824262841**	**26449586**
BUSINESS PROCESSH AUTOMATION	500333703	0	0	500333703	0	0	500333703	1751046
SWITCHGEARS	6508611364	99074	16885046	6491825392	311602232	0	6180223160	219562345
TRANSFORMER	4926467446	99273	14041861	4912524858	354800351	0	4557724507	177468915
SCADA	458120050	0	0	458120050	0	0	458120050	6265918
BATTERIES	131799193	0	816240	130982953	150851	0	130832102	6942075
CAPACITORS	166910176	89782	0	166999958	3615733	0	163384225	6239506
PLANT & MACHINERY	**12692241932**	**288129**	**31743147**	**12660786914**	**670169167**	**0**	**11990617747**	**418229804**
CABLE & MAINS	12000780104	11871	11205874	11989586101	384979655	1473798454	10130807992	442971330
DIST PILLARS	397511245	0	2459930	395051315	8101520	0	386949795	14614104
CABLE & MAINS	**12398291349**	**11871**	**13665804**	**12384637416**	**393081175**	**1473798454**	**10517757787**	**457585434**
METERS (CONVENTIONAL)	413795644	0	58636288	355159356	50225000	0	304934356	2477739
METERS (ELECTRONICS)	1397214247	0	87183623	1310030624	148887387	0	1161143237	87755440
METERS AND INSTALLATIONS	**1811009891**	**0**	**145819911**	**1665189980**	**199112387**	**0**	**1466077593**	**90233178**
STREET LIGHTING LAMPS	**1622825786**	**0**	**0**	**1622825786**	**259545591**	**0**	**1363280195**	**51784998**
D.E.A. ON HIRE	**419929**	**0**	**0**	**419929**	**0**	**0**	**419929**	**0**
MOTOR VEHICLES	**138266695**	**0**	**0**	**138266695**	**0**	**0**	**138266695**	**2824505**
MACHINE TOOLS	397210517	0	396071	396814446	0	0	396814446	18158435
ELECTRONIC EQUIP SEPRATED M.T.	27419074	0	0	27419074	0	0	27419074	1556812
LOOSE TOOLS	979324	0	0	979324	0	0	979324	0
TOOLS AND EQUIPMENTS	**425608915**	**0**	**396071**	**425212844**	**0**	**0**	**425212844**	**19715246**
FURNITURE	27069470	0	3105	27066365	0	0	27066365	427957
ROOM A.C.	24661923	0	169148	24492775	0	0	24492775	996721
PERSONAL COMPUTER	190686180	0	2600445	188085735	0	0	188085735	7944019
ELECTRONIC EQUIP	5380858	0	0	5380858	0	0	5380858	163162
CYCLOSTYLE MACH	1489499	0	60949	1428550	0	0	1428550	34486
OFFICE EQUIPMENTS	27255789	0	352589	26903200	0	0	26903200	994871
FURNITURE AND OFFICE EQUIPMENTS	**276543720**	**0**	**3186236**	**273357483**	**0**	**0**	**273357483**	**10561216**
TOTAL :	**30212469039**	**300000**	**194855732**	**30017913307**	**1521908320**	**1473798454**	**27022206533**	**1077383968**

SUMMARY OF DEPRECIATION CHARGED ON ASSETS OF SUPPLY DIVISION
DURING FINANCIAL YEAR 2022-23

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2021	BALANCE VALUE OF ASSETS (after w/off & other adjustments)	NET ASSETS VALUE AS ON 31.03.21 (after GOVT. grant & Capital conn fees	DEP. CHARGED FOR YEAR 2022-23
1	7	10	13	15
		(7-8-/+9)	(10-11-12)	(13*14)
LAND	22953418	22953418	22953418	0
BUILDING	824157938	824113375	824113375	26445357
BLDG CASH COLLN PORT CWK	149466	149466	149466	4229
MOTOR VEHICLE	138266695	138266695	138266695	2824505
MACHINE TOOLS	397210517	396814446	396814446	18158435
FURNITURE	27069470	27066365	27066365	427957
ROOM A.C.	24661923	24492775	24492775	996721
PERSONAL COMPUTER	190686180	188085735	188085735	7944019
ELECTRONIC EQUIP	5380858	5380858	5380858	163162
ELECTRONIC EQUIP SEPRATED M.T.	27419074	27419074	27419074	1556812
CYCLOSTYLE MACH	1489499	1428550	1428550	34486
CABLE & MAINS	12000780104	11989586101	10130807992	442971330
DIST PILLARS	397511245	395051315	386949795	14614104
ST LTG LAMPS	1622825786	1622825786	1363280195	51784998
METERS (CONVENTIONAL)	413795644	355159356	304934356	2477739
METERS (ELECTRONICS)	1397214247	1310030624	1161143237	87755440
BUSINESS PROC AUTOMATION	500333703	500333703	500333703	1751046
SWITCHGEARS	6508611364	6491825392	6180223160	219562345
TRANSFORMER	4926467446	4912524858	4557724507	177468915
SCADA	458120050	458120050	458120050	6265918
BATTERIES	131799193	130982953	130832102	6942075
CAPACITORS	166910176	166999958	163384225	6239506
DEA ON HIRE	419929	419929	419929	0
LOOSE TOOLS	979324	979324	979324	0
OFFICE EQUIPMENTS	27255789	26903200	26903200	994871
TOTAL : OF SUPPLY DIVISION	30212469039	30017913307	27022206533	1077383968
ADD : SHARE OF GEN. ADM.@50% (31292622.00)				15646311
TOTAL :				1093030279

Received Government Grant distributed proportionatly in the year 2020-2021

IPDS Grant Received Rs.568813229/- Less 189900000/- consider in 2019-20
balance Grant Rs.378913229/- Distributed Proportionatly to Concern Assets.

				378913229.00
ASSETS		IPDS EXP		PROPORTIONATE
METERS ELECTONIC		62540000.00	62540000.00	32826592.05
CABLE	2910	99280978.73		
	2911	35632921.60		
	2913	207885.42		
	2935	45350423.75		
	2924	37597726.00	218069935.50	114462628.9
TRANSFORMER	2903	252798326.45		
	2930	43129381.34	295927707.79	155329359.4
SWITCHGEAR	2901	32449908.60		
	2902	17250068.76		
	2904	57611303.99		
	2905	9223426.77		
	2908	2775112.00		
	2914	293321.79		
	2915	12007614.00		
	2921	0.00		
	2931	2306971.00	133917726.91	70292014.54
CAPACITOR	2906	6864418.00	6864418.00	3603061.23
BATTERIES	2907	2816388.00	2816388.00	1478292.61
PILARS	2932	1647575.81		
	2937	107612.95	1755188.76	921280.227
			721891364.96	378913229.00

DEPRECIATION FOR THE YEAR 2013-14

LAND

YEAR	BOOK VALUE AS ON 31.03.2013	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.13	RATE OF DEP.	DEP. PROVISION FOR YEAR 2013-14	CUMM.DEP. PROVIDED UPTO 2012-13	CUMM. DEP. PROVIDED UPTO 2013-14	REMARK
1	7	8	9	10	11	13	14	15	16	17	
				(7-8-/+9)		(10-11-12)		(13*14)		(16+15)	
TOTAL :	0	0	0	0	0	0		0	0	0	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 27 YEARS LIFE : 45 YEARS

BUILDING

FROM : 2011-12 RATE OF DEP : 2%

RATE OF DEP : 3.34%

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1946	3581944	0	0	3581944	3581944	2%	0	3223750	3223750	90
1947	141019	0	0	141019	141019	2%	0	126917	126917	90
1948	14407	0	0	14407	14407	2%	0	12966	12966	90
1949	71813	0	0	71813	71813	2%	0	64632	64632	90
1950	197567	0	0	197567	197567	2%	0	177810	177810	90
1951	340880	0	0	340880	340880	2%	0	306792	306792	90
1952	815879	0	0	815879	815879	2%	0	734291	734291	90
1953	481538	0	0	481538	481538	2%	0	433384	433384	90
1954	95470	0	0	95470	95470	2%	0	85923	85923	90
1955	217964	0	0	217964	217964	2%	0	196168	196168	90
1956	1543151	0	0	1543151	1543151	2%	0	1388836	1388836	90
1957	1525611	0	0	1525611	1525611	2%	0	1373050	1373050	90
1958	497308	0	0	497308	497308	2%	0	447577	447577	90
1959	1226363	0	0	1226363	1226363	2%	0	1103727	1103727	90
1960	1113878	0	0	1113878	1113878	2%	0	1002490	1002490	90
1961	1880151	0	0	1880151	1880151	2%	0	1692136	1692136	90
1962	2776044	0	0	2776044	2776044	2%	0	2498440	2498440	90
1963	1356809	0	0	1356809	1356809	2%	0	1221128	1221128	90
1964	826541	0	0	826541	826541	2%	0	743887	743887	90
1965	255812	0	0	255812	255812	2%	0	230231	230231	90
1966	301079	0	0	301079	301079	2%	0	270971	270971	90
1967	1079310	0	0	1079310	1079310	2%	0	971379	971379	90
1968	400485	0	0	400485	400485	2%	0	360437	360437	90
1969	1397125	0	0	1397125	1397125	2%	0	1257413	1257413	90
1970	697402	0	0	697402	697402	2%	0	624224	624224	90
1971	1686597	0	0	1686597	1686597	2%	0	1517937	1517937	90
1972	2339512	0	0	2339512	2339512	2%	0	2105561	2105561	90
1973	2411311	0	0	2411311	2411311	2%	0	2170180	2170180	90
1974	1145455	0	0	1145455	1145455	2%	0	1030910	1030910	90
1975	1178382	0	0	1178382	1178382	2%	0	1060544	1060544	90
1976	500185	0	0	500185	500185	2%	0	450167	450167	90
1977	7157914	0	0	7157914	7157914	3.34%	0	6442123	6442123	90
1978	6883580	0	0	6883580	6883580	3.34%	0	6195222	6195222	90
1979	368085	0	0	368085	368085	3.34%	0	331276	331276	90
1980	781042	0	0	781042	781042	3.34%	0	702937	702937	90
1981	364429	0	0	364429	364429	3.34%	0	327986	327986	90
1982	-227602	0	0	-227602	-227602	3.34%	0	-204842	-204842	90
1983	1121912	0	0	1121912	1121912	3.34%	0	1009721	1009721	90
1984	2964297	0	0	2964297	2964297	3.34%	0	2667867	2667867	90
1985	9314721	0	0	9314721	9314721	3.34%	0	8383249	8383249	90
1986	4606890	0	0	4606890	4606890	3.34%	58047	4088154	4146201	90
1987	9708667	0	0	9708667	9708667	3.34%	316503	8421298	8737801	90
1988	20411846	0	0	20411846	20411846	3.34%	681756	17296998	17978754	88
1989	10603374	0	0	10603374	10603374	3.34%	354153	8773232	9127384	86
1990	6365514	0	0	6365514	6365514	3.34%	212608	5139516	5352124	84
1991	22484854	0	0	22484854	22484854	3.34%	750994	17704574	18455568	82
1992	24204055	0	0	24204055	24204055	3.34%	808415	18574192	19382607	80
1993	77298026	0	0	77298026	77298026	3.34%	2581754	57772545	60354299	78
1994	110032650	0	0	110032650	110032650	3.34%	3675091	80037750	83712840	76
1995	20021983	0	0	20021983	20021983	3.34%	668734	14163551	14832285	74
1996	23416339	0	0	23416339	23416339	3.34%	782106	16096391	16878497	72
1997	90149592	0	0	90149592	90149592	3.34%	3010996	60165838	63176834	70
1998	113651012	0	0	113651012	113651012	3.34%	3795944	73577665	77373609	68
1999	106754679	0	0	106754679	106754679	3.34%	3565606	66977886	70543492	66
2000	44283153	0	0	44283153	44283153	3.34%	1479057	26897587	28376644	64
2001	19939515	0	0	19939515	19939515	3.34%	665980	11712471	12378451	62
2002	2066618	0	0	2066618	2066618	3.34%	69025	1172599	1241624	60
2003	462208	0	0	462208	462208	3.34%	15438	253013	268450	58
2004	392398	0	0	392398	392398	3.34%	13106	206951	220057	56
2005	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2006	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2007	453488	0	0	453488	453488	3.34%	15146	211960	227107	50
2008	125400	0	0	125400	125400	3.34%	4188	56104	60292	48
2009	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2010	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2011	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2012	31600	0	0	31600	31600	3.34%	1055	10554	11610	37
2013	3908429	0	0	3908429	3908429	3.34%	130542	1174874	1305415	33
2014	869861	0	0	869861	869861	3.34%	29053	232427	261480	30
2015	3597926	0	0	3597926	3597926	3.34%	120171	841195	961366	27
2016	2530202	0	0	2530202	2530202	3.34%	84509	507052	591561	23
2017	1660275	0	0	1660275	1660275	3.34%	55453	277266	332719	20
2018	180433	0	0	180433	180433	3.34%	6026	24106	30132	17
2019	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2020	3200000	0	0	3200000	3200000	3.34%	106880	213760	320640	10
2021	0	0	0	0	0	3.34%	0	0	0	#DIV/0!
2022	400000	0	0	400000	400000	3.34%	13360	0	13360	3
TOTAL :	784636357	0	0	784636357	784636357		24071697	547320903	571392601	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 17 YEARS

STATIC ROOM A.C.

FROM : 2011-2012 LIFE : 15 YRS

RATE OF DEP : 5.28% RATE OF DEP. : 6 %

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1978	14000	0	0	14000	14000	6%	0	12600	12600	90
1979	22502	20065	0	2437	2437	6%	0	2193	2193	90
1980	0	0	0	0	0	6%	0	0	0	#DIV/0!
1981	0	0	0	0	0	6%	0	0	0	#DIV/0!
1982	474787	0	0	474787	474787	6%	0	427308	427308	90
1983	0	0	0	0	0	6%	0	0	0	#DIV/0!
1984	0	0	0	0	0	6%	0	0	0	#DIV/0!
1985	2491	0	0	2491	2491	6%	0	2242	2242	90
1986	170765	152483	0	18282	18282	6%	0	16454	16454	90
1987	791175	0	0	791175	791175	6%	0	712058	712058	90
1988	497820	0	0	497820	497820	6%	0	448038	448038	90
1989	0	0	0	0	0	6%	0	0	0	#DIV/0!
1990	0	0	0	0	0	6%	0	0	0	#DIV/0!
1991	341014	0	0	341014	341014	6%	0	306913	306913	90
1992	86188	33351	0	52837	52837	6%	0	47553	47553	90
1993	0	0	0	0	0	6%	0	0	0	#DIV/0!
1994	0	0	0	0	0	6%	0	0	0	#DIV/0!
1995	0	0	0	0	0	6%	0	0	0	#DIV/0!
1996	0	0	0	0	0	6%	0	0	0	#DIV/0!
1997	0	0	0	0	0	6%	0	0	0	#DIV/0!
1998	0	0	0	0	0	6%	0	0	0	#DIV/0!
1999	0	0	0	0	0	6%	0	0	0	#DIV/0!
2000	0	0	0	0	0	6%	0	0	0	#DIV/0!
2001	0	0	0	0	0	6%	0	0	0	#DIV/0!
2002	0	0	0	0	0	6%	0	0	0	#DIV/0!
2003	0	0	0	0	0	6%	0	0	0	#DIV/0!
2004	0	0	0	0	0	6%	0	0	0	#DIV/0!
2005	0	0	0	0	0	6%	0	0	0	#DIV/0!
2006	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2007	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2022	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL:	2400742.02	205899	0	2194843.5	2194843.5		0	1975359	1975359	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER

MOTOR VEHICLES

FROM : 2011-12

LIFE : 8 YRS.

RATE OF DEP : 11.25%

RATE OF DEP.: 11.25%

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1982	20597	0	0	20597	20597	11.25%	0	18537	18537	90
1983	294325	0	0	294325	294325	11.25%	0	264893	264893	90
1984	130037	0	0	130037	130037	11.25%	0	117033	117033	90
1985	90429	0	0	90429	90429	11.25%	0	81386	81386	90
1986	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
1987	251142	0	0	251142	251142	11.25%	0	226028	226028	90
1988	319831	0	0	319831	319831	11.25%	0	287848	287848	90
1989	169537	0	0	169537	169537	11.25%	0	152583	152583	90
1990	156408	0	0	156408	156408	11.25%	0	140767	140767	90
1991	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
1992	24215	0	0	24215	24215	11.25%	0	21794	21794	90
1993	5435922	0	0	5435922	5435922	11.25%	0	4892330	4892330	90
1994	136897	0	0	136897	136897	11.25%	0	123207	123207	90
1995	640296	0	0	640296	640296	11.25%	0	576266	576266	90
1996	460825	0	0	460825	460825	11.25%	0	414743	414743	90
1997	601437	0	0	601437	601437	11.25%	0	541293	541293	90
1998	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
1999	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2000	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2001	852668	0	0	852668	852668	11.25%	0	767401	767401	90
2002	6673427	0	0	6673427	6673427	11.25%	0	6006084	6006084	90
2003	4507074	1754185	0	2752888	2752888	11.25%	0	2477600	2477600	90
2004	179709	179709	0	0	0	11.25%	0	0	0	38
2005	2572613	426563	0	2146050	2146050	11.25%	0	1931445	1931445	90
2006	877500	477302	0	400198	400198	11.25%	0	360178	360178	90
2007	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2008	940806	0	0	940806	940806	11.25%	0	846725	846725	90
2009	3744089	0	0	3744089	3744089	11.25%	0	3369680	3369680	90
2010	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2011	2914684	0	0	2914684	2914684	11.25%	0	2623216	2623216	90
2012	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2013	805406	0	0	805406	805406	11.25%	0	724865	724865	90
2014	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2015	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2016	792162	0	0	792162	792162	11.25%	89118	534709	623828	79
2017	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2018	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
2019	1599998	0	0	1599998	1599998	11.25%	180000	539999	719999	45
2020	3123816	0	0	3123816	3123816	11.25%	351429	702859	1054288	34
2021	979780	0	0	979780	979780	11.25%	110225	110225	220451	23
2022	0	0	0	0	0	11.25%	0	0	0	#DIV/0!
TOTAL :	39295630	2837759	0	3.6E+07	36457870		730773	28853695	29584467	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 17 YEARS

TOOLS & EQUIPMENTS

FROM : 2011-12 LIFE : 18 YRS.

RATE OF DEP :5.28% RATE OF DEP.: 5%

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1970	1812	0	0	1812	1812	5%	0	1631	1631	90
1971	37644	0	0	37644	37644	5%	0	33880	33880	90
1972	50899	0	0	50899	50899	5%	0	45809	45809	90
1973	19494	0	0	19494	19494	5%	0	17545	17545	90
1974	41285	0	0	41285	41285	5%	0	37157	37157	90
1975	725	0	0	725	725	5%	0	653	653	90
1976	37637	0	0	37637	37637	5%	0	33873	33873	90
1977	40051	0	0	40051	40051	5%	0	36046	36046	90
1978	3025	0	0	3025	3025	5%	0	2723	2723	90
1979	84363	0	0	84363	84363	5%	0	75927	75927	90
1980	88844	0	0	88844	88844	5%	0	79960	79960	90
1981	16246	0	0	16246	16246	5%	0	14621	14621	90
1982	69785	0	0	69785	69785	5%	0	62807	62807	90
1983	2511	0	0	2511	2511	5%	0	2260	2260	90
1984	51446	0	0	51446	51446	5%	0	46301	46301	90
1985	1564682	0	0	1564682	1564682	5%	0	1408214	1408214	90
1986	27285	0	0	27285	27285	5%	0	24557	24557	90
1987	-2088831	0	0	-2088831	-2E+06	5%	0	-1879948	-1879948	90
1988	0	0	0	0	0	5%	0	0	0	#DIV/0!
1989	4301	0	0	4301	4301	5%	0	3871	3871	90
1990	37708	0	0	37708	37708	5%	0	33937	33937	90
1991	0	0	0	0	0	5%	0	0	0	#DIV/0!
1992	145011	0	0	145011	145011	5%	0	130510	130510	90
1993	101770	0	0	101770	101770	5%	0	91593	91593	90
1994	223554	0	0	223554	223554	5%	0	201199	201199	90
1995	0	0	0	0	0	5%	0	0	0	#DIV/0!
1996	0	0	0	0	0	5%	0	0	0	#DIV/0!
1997	0	0	0	0	0	5%	0	0	0	#DIV/0!
1998	183841	0	0	183841	183841	5%	0	165457	165457	90
1999	128198	0	0	128198	128198	5.28%	0	115378	115378	90
2000	51304	0	0	51304	51304	5.28%	0	46174	46174	90
2001	36504	0	0	36504	36504	5.28%	0	32854	32854	90
2002	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2003	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2004	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2005	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2006	295239	0	0	295239	295239	5.28%	5669	260047	265716	90
2007	15456	0	0	15456	15456	5.28%	816	12841	13657	88
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	15751	0	0	15751	15751	5.28%	832	11511	12342	78
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	214200	0	0	214200	214200	5.28%	11310	124407	135717	63
2012	22218	0	0	22218	22218	5.28%	1173	11731	12904	58
2013	1201920	0	0	1201920	1201920	5.28%	63461	571152	634614	53
2014	21924	0	0	21924	21924	5.28%	1158	9261	10418	48
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	17366	0	0	17366	17366	5.28%	917	4585	5502	32
2018	189980	0	0	189980	189980	5.28%	10031	40124	50155	26
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	12600	0	0	12600	12600	5.28%	665	1331	1996	16
2021	12600	0	0	12600	12600	5.28%	665	665	1331	11
2022	150000	0	0	150000	150000	5.28%	7920	0	7920	5
TOTAL :	3130348	0	0	3130348	3130348		104617	1912640	2017257	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 14 YEARS

FURNITURE & OFFICE EQUIPMENTS

FROM 2011-12 | LIFE : 18 YRS.

RATE OF DEP : 6.33% | RATE OF DEP.: 5%

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.2023	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1970	62492	0	0	62492	62492	5%	0	56243	56243	90
1971	145047	0	0	145047	145047	5%	0	130542	130542	90
1972	11403	0	0	11403	11403	5%	0	10263	10263	90
1973	47971	0	0	47971	47971	5%	0	43174	43174	90
1974	35999	0	0	35999	35999	5%	0	32399	32399	90
1975	94349	0	0	94349	94349	5%	0	84914	84914	90
1976	239685	0	0	239685	239685	5%	0	215717	215717	90
1977	106729	0	0	106729	106729	5%	0	96056	96056	90
1978	93595	5090	0	88505	88505	5%	0	79654	79654	90
1979	96530	0	0	96530	96530	5%	0	86877	86877	90
1980	178447	0	0	178447	178447	5%	0	160602	160602	90
1981	69941	0	0	69941	69941	5%	0	62947	62947	90
1982	304410	0	0	304410	304410	5%	0	273969	273969	90
1983	168775	0	0	168775	168775	5%	0	151898	151898	90
1984	285671	0	0	285671	285671	5%	0	257104	257104	90
1985	272177	0	0	272177	272177	5%	0	244959	244959	90
1986	276916	0	0	276916	276916	5%	0	275788	275788	90
1987	0	0	0	0	0	5%	0	0	0	#DIV/0!
1988	415354	0	0	415354	415354	5%	0	373819	373819	90
1989	603115	0	0	603115	603115	5%	0	542804	542804	90
1990	85898	0	0	85898	85898	5%	0	77308	77308	90
1991	48356	15859	0	32497	32497	5%	0	29247	29247	90
1992	0	0	0	0	0	5%	0	0	0	#DIV/0!
1993	0	0	0	0	0	5%	0	0	0	#DIV/0!
1994	0	0	0	0	0	5%	0	0	0	#DIV/0!
1995	15728	0	0	15728	15728	5%	0	14155	14155	90
1996	17848	0	0	17848	17848	5%	0	16063	16063	90
1997	88045	0	0	88045	88045	5%	0	79241	79241	90
1998	73972	0	0	73972	73972	6.33%	0	66574	66574	90
1999	70189	0	0	70189	70189	6.33%	0	63170	63170	90
2000	512524	38500	0	474024	474024	6.33%	0	426622	426622	90
2001	432419	0	0	432419	432419	6.33%	0	389177	389177	90
2002	171691	0	0	171691	171691	6.33%	0	154522	154522	90
2003	26951	0	0	26951	26951	6.33%	0	24256	24256	90
2004	1767727	0	0	1767727	1767727	6.33%	0	1590955	1590955	90
2005	141261	0	0	141261	141261	6.33%	0	127135	127135	90
2006	366521	0	0	366521	366521	6.33%	0	329869	329869	90
2007	817937	0	0	817937	817937	6.33%	0	736143	736143	90
2008	295597	0	0	295597	295597	6.33%	1094	264944	266038	90
2009	983090	0	0	983090	983090	6.33%	52792	831989	884781	90
2010	351459	0	0	351459	351459	6.33%	22247	279867	302114	86
2011	501625	0	0	501625	501625	6.33%	31753	349281	381034	76
2012	33139	0	0	33139	33139	6.33%	2098	20977	23075	70
2013	213212	0	0	213212	213212	6.33%	13496	121467	134963	63
2014	1215514	0	0	1215514	1215514	6.33%	76942	615536	692478	57
2015	106892	0	0	106892	106892	6.33%	6766	47364	54130	51
2016	96188	0	0	96188	96188	6.33%	6089	36532	42621	44
2017	0	0	0	0	0	6.33%	0	0	0	#DIV/0!
2018	409969	0	0	409969	409969	6.33%	25951	103804	129755	32
2019	120304	0	0	120304	120304	6.33%	7615	22846	30461	25
2020	23458	0	0	23458	23458	6.33%	1485	2970	4455	19
2021	810312	0	0	810312	810312	6.33%	51293	51293	102585	13
2022	130794	0	0	130794	130794	6.33%	8279	0	8279	6
TOTAL:	13437226	59449	0	13377777	13377777		307900	10053034	10360934	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 9 YEARS

ROOM A.C.

FROM 2011-12 — LIFE : 7 YRS.

RATE OF DEP : 9.50% — RATE OF DEP.: 12.86 %

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.2023	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
2001	10003	0	0	10003	10003	12.86%	0	9003	9003	90
2002	18600	0	0	18600	18600	12.86%	0	16740	16740	90
2003	93376	0	0	93376	93376	12.86%	0	84034	84034	90
2004	0	0	0	0	0	12.86%	0	0	0	0
2005	156903	26574	0	130329	130329	12.86%	0	117295	117295	90
2006	117604	0	0	117604	117604	12.86%	0	105844	105844	90
2007	57250	0	0	57250	57250	9.50%	0	51525	51525	90
2008	177061	0	0	177061	177061	9.50%	0	159355	159355	90
2009	207558	0	0	207558	207558	9.50%	0	186802	186802	90
2010	292796	0	0	292796	292796	9.50%	0	263516	263516	90
2011	223130	29500	0	193630	193630	9.50%	0	174267	174267	90
2012	34803	0	0	34803	34803	9.50%	0	31323	31323	90
2013	183317	0	0	183317	183317	9.50%	8249	156736	164985	90
2014	79650	0	0	79650	79650	9.50%	7567	60534	68101	86
2015	341369	0	0	341369	341369	9.50%	32430	227010	259440	76
2016	206319	0	0	206319	206319	9.50%	19600	117602	137202	67
2017	737187	0	0	737187	737187	9.50%	70033	350164	420197	57
2018	91450	0	0	91450	91450	9.50%	8688	34751	43439	48
2019	393033	0	0	393033	393033	9.50%	37338	112014	149353	38
2020	94700	0	0	94700	94700	9.50%	8997	17993	26990	29
2021	500501	0	0	500501	500501	9.50%	47548	47548	95095	19
2022	959336	0	0	959336	959336	9.50%	91137	0	91137	10
TOTAL :	4975946	56074	0	4919872	4919872		331586	2324056	2655641	

DEPRECIATION FOR THE YEAR 2023-24 | MERC ORDER : | LIFE : 7 YRS. | RATE OF DEP.: 12.86 %

PERSONAL COMPUTER

FROM 2011-12 | FROM : | LIFE : 6 YRS. | RATE OF DEP.: 15 %

RATE OF DEP ; 15% | 2005-06

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.2023	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
2007	78563	0	0	78563	78563	15%	0	70706	70706	90
2008	62353	0	0	62353	62353	15%	0	56118	56118	90
2009	3678284	480706	0	3197578	3197578	15%	0	2877821	2877821	90
2010	1439527	357373	0	1082154	1082154	15%	0	973938	973938	90
2011	668776	668776	0	0	0	15%	0	0	0	#DIV/0!
2012	3092720	3092720	0	0	0	15%	0	0	0	#DIV/0!
2013	6046955	4594342	0	1452613	1452613	15%	0	1307352	1307352	90
2014	3732350	90592	0	3641758	3641758	15%	0	3277582	3277582	90
2015	5403892	1027332	0	4376560	4376560	15%	0	3938904	3938904	90
2016	13394136	0	0	13394136	13394136	15%	0	12054722	12054722	90
2017	3856372	0	0	3856372	3856372	15%	578456	2892279	3470735	90
2018	5711545	0	0	5711545	5711545	15%	856732	3426927	4283658	75
2019	2825965	0	0	2825965	2825965	15%	423895	1271684	1695579	60
2020	2981341	0	0	2981341	2981341	15%	447201	894402	1341603	45
2021	4560209	0	0	4560209	4560209	15%	684031	684031	1368063	30
2022	5882956	0	0	5882956	5882956	15%	882443	0	882443	15
TOTAL :	63415943	1E+07	0	53104102	53104102		3872758	33726466	37599224	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 6 YEARS

CYCLOSTYLE MACHINE

FROM 2011-12

LIFE : 10 YRS.

RATE OF DEP.: 9 %

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1997	356311	0	0	356311	356311	9%	0	320680	320680	90
1998	0	0	0	0	0	9%	0	0	0	#DIV/0!
1999	0	0	0	0	0	9%	0	0	0	#DIV/0!
2000	0	0	0	0	0	9%	0	0	0	#DIV/0!
2001	111	0	0	111	111	9%	0	100	100	90
2002	0	0	0	0	0	9%	0	0	0	#DIV/0!
2003	0	0	0	0	0	9%	0	0	0	#DIV/0!
2004	0	0	0	0	0	9%	0	0	0	#DIV/0!
2005	0	0	0	0	0	15%	0	0	0	#DIV/0!
2006	0	0	0	0	0	15%	0	0	0	#DIV/0!
2007	0	0	0	0	0	15%	0	0	0	#DIV/0!
2008	0	0	0	0	0	15%	0	0	0	#DIV/0!
2009	57289	0	0	57289	57289	15%	0	51560	51560	90
2010	42525	0	0	42525	42525	15%	0	38273	38273	90
2011	65875	0	0	65875	65875	15%	0	59288	59288	90
2012	0	0	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	147375	0	0	147375	147375	15%	0	132638	132638	90
2016	821420	0	0	821420	821420	15%	0	739278	739278	90
2017	193536	0	0	193536	193536	15%	29030	145152	174182	90
2018	0	0	0	0	0	15%	0	0	0	#DIV/0!
2019	313290	0	0	313290	313290	15%	46994	140981	187974	60
2020	0	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	0	15%	0	0	0	#DIV/0!
2022	0	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	1997732	0	0	1997732	1997732		76024	1627948	1703972	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 6 YEARS

ELECTRONIC EQUIPMENTS (SEPERATED FROM O FROM : 2011-12 LIFE : 12 YRS.

RATE OF DEP. : 15% RATE OF DEP.: 7.5 %

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
2000	16676	0	0	16676	16676	7.5%	0	15008	15008	90
2001	12940	0	0	12940	12940	7.5%	0	11646	11646	90
2002	0	0	0	0	0	7.5%	0	0	0	#DIV/0!
2003	162441	0	0	162441	162441	15%	0	146197	146197	90
2004	0	0	0	0	0	15%	0	0	0	#DIV/0!
2005	16944	0	0	16944	16944	15%	0	15250	15250	90
2006	14950	0	0	14950	14950	15%	0	13455	13455	90
2007	5840	0	0	5840	5840	15%	0	5256	5256	90
2008	47210	0	0	47210	47210	15%	0	42489	42489	90
2009	0	0	0	0	0	15%	0	0	0	#DIV/0!
2010	0	0	0	0	0	15%	0	0	0	#DIV/0!
2011	0	0	0	0	0	15%	0	0	0	#DIV/0!
2012	0	0	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	0	0	0	0	0	15%	0	0	0	#DIV/0!
2016	0	0	0	0	0	15%	0	0	0	#DIV/0!
2017	146849	0	0	146849	146849	15%	22027	110137	132164	90
2018	262661	0	0	262661	262661	15%	39399	157597	196996	75
2019	19989	0	0	19989	19989	15%	2998	8995	11993	60
2020	0	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	0	15%	0	0	0	#DIV/0!
2022	369500000	0	0	369500000	369500000	15%	55425000	0	55425000	15
TOTAL :	370206500	0	0	370206500	370206500		55489425	526029	56015453	

DEPRECIATION FOR THE YEAR 2023-24 LIFE : 10 YRS. RATE OF DEP.: 9 %

PLANT & MACHINERY (EDP-IN HOUSE COMPUTER FROM 2005 - LIFE : 6 YRS. RATE OF DEP.: 15 %

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1982	1982337	0	0	1982337	1982337	9%	0	1784103	1784103	90
1983	595068	0	0	595068	595068	9%	0	535561	535561	90
1984	1155443	0	0	1155443	1155443	9%	0	1039899	1039899	90
1985	1061569	0	0	1061569	1061569	9%	0	955412	955412	90
1986	-454962	0	0	-454962	-454962	9%	0	-409466	-409466	90
1987	505465	0	0	505465	505465	9%	0	454919	454919	90
1988	400206	0	0	400206	400206	9%	0	360185	360185	90
1989	1287766	0	0	1287766	1287766	9%	0	1158989	1158989	90
1990	154270	0	0	154270	154270	9%	0	138843	138843	90
1991	0	0	0	0	0	9%	0	0	0	#DIV/0!
1992	-505236	0	0	-505236	-505236	9%	0	-454712	-454712	90
1993	20000	0	0	20000	20000	9%	0	18000	18000	90
1994	264186	0	0	264186	264186	9%	0	237767	237767	90
1995	362268	0	0	362268	362268	9%	0	326041	326041	90
1996	372132	0	0	372132	372132	9%	0	334919	334919	90
1997	1887	0	0	1887	1887	9%	0	1698	1698	90
1998	4922404	0	0	4922404	4922404	9%	0	4430164	4430164	90
1999	7301476	0	0	7301476	7301476	9%	0	6571328	6571328	90
2000	2169517	0	0	2169517	2169517	9%	0	1952565	1952565	90
2001	320598	0	0	320598	320598	9%	0	288538	288538	90
2002	0	0	0	0	0	9%	0	0	0	#DIV/0!
2003	145925	0	0	145925	145925	9%	0	131333	131333	90
2004	256500	0	0	256500	256500	9%	0	230850	230850	90
2005	178454	0	0	178454	178454	15%	0	160608	160608	90
2006	179499	0	0	179499	179499	15%	0	161549	161549	90
2007	968958	0	0	968958	968958	15%	0	872062	872062	90
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2022	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	23645730	0	0	23645730	23645730		0	21281157	21281157	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 17 YEARS

PLANT & MACHINERY (STORES DEPART FROM : 2011-12 LIFE : 22 YRS.

RATE OF DEP. : 5.28% RATE OF DEP.: 4.09 %

YEAR	BOOK VALUE AS ON 31.03.2022	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	3	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1988	237359	0	0	237359	237359	4.09%	0	213623	213623	90
1989	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1990	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1991	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1992	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1993	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1994	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1995	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1996	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1997	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1998	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
1999	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2000	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2001	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2002	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2003	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2004	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2005	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2006	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2007	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2008	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2009	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2010	0	0	0	0	0	4.09%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2022	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	237359	0	0	237359	237359		0	213623	213623	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 17 YEARS

SECURITY EQUIPMENT

FROM : 2011-12 LIFE : 100 YRS.

RATE OF DEP. : 5.28 RATE OF DEP.: 0.90 %

YEAR	BOOK VALUE AS ON 31.03.2023	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1992	1059000	0	0	1059000	1059000	5.28%	55915	805687	861602	81
1993	2071350	0	0	2071350	2071350	5.28%	109367	1557241	1666608	80
1994	28000	0	0	28000	28000	5.28%	1478	20798	22277	80
1995	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1996	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1997	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1998	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
1999	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2000	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2001	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2002	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2003	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2004	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2005	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2006	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2007	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2008	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2009	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	102038	0	0	102038	102038	5.28%	5388	48488	53876	53
2014	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2022	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	3260388	0	0	3260388	3260388		172148	2432215	2604363	

DEPRECIATION FOR THE YEAR 2023-24

FAX / XEROX MACHINE

LIFE : 6 YRS.

RATE OF DEP.: 15 %

YEAR	BOOK VALUE AS ON 01.04.2022	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	13	14	15	16	17	
				(7-8-/+9)	(10-11-12)		(13*14)		(16+15)	
1999	22030	0	0	22030	22030	15%	0	19827	19827	90
2011	17430	0	0	17430	17430	15%	0	15687	15687	90
2012	38450	0	0	38450	38450	15%	0	34605	34605	90
2013	37550	0	0	37550	37550	15%	0	33795	33795	90
2014	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	62055	17955	0	44100	44100	15%	0	39690	39690	126.6429
2016	41763	0	0	41763	41763	15%	0	37587	37587	90
2017	0	0	0	0	0	15%	0	0	0	#DIV/0!
2018	0	0	0	0	0	15%	0	0	0	#DIV/0!
2019	0	0	0	0	0	15%	0	0	0	#DIV/0!
2020	0	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	0	15%	0	0	0	#DIV/0!
2022	898099	0	0	898099	898099	15%	134715	0	134715	15
TOTAL :	1117377	17955	0	1099422	1099422		134715	181191	315906	

SUMMARY OF PROVISION OF DEPRECIATION ON ASSETS OF GENERAL ADMINISTRATION DIVISION
<u>FOR THE YEAR 2023-24</u>

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2022	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	DEP. PROVISION FOR YEAR 2023-24
1	7	8	9	10	11	13	15
				(7-8-/+9)		(10-11-12)	(13*14)
LAND	41129691			41129691		41129691	0
BUILDING	784636357	0	0	784636357	0	784636357	24071697
STATIC ROOM A.C.	2400742.02	205899	0	2194843	0	2194843	0
MOTOR VEHICLE	39295630	2837759	0	36457870	0	36457870	730773
TOOLS & EQUIPMENT	3130348	0	0	3130348	0	3130348	104617
FURNITURE & OFF.EQUIP.	13437226	59449	0	13377777	0	13377777	307900
ROOM A.C.	4975946	56074	0	4919872	0	4919872	331586
PERSONAL COMPUTER	63415943	10311841	0	53104102	0	53104102	3872758
CYCLOSTYLE MACHINE	1997732	0	0	1997732	0	1997732	76024
ELECTRONIC EQUIPMENT	370206500	0	0	370206500	0	370206500	55489425
PL & MACH. EDP.	23645730	0	0	23645730	0	23645730	0
PL & MACH STOCK	237359	0	0	237359	0	237359	0
SECURITY EQUIPMENT	3260388	0	0	3260388	0	3260388	172148
FAX MACHINE	1117377	17955	0	1099422	0	1099422	134715
TOTAL :	1352886968	13488978	0	1339397990	0	1339397990	85291643

DETAILS OF E-6 WISE ASSETS GROUPING - GENERAL ADMINISTRATION DIVISION

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2022	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	DEP. PROVISION FOR YEAR 2023-24
LAND	**41129691**	**0**	**0**	**41129691**	**0**	**41129691**	**0**
BUILDING	784636357	0	0	784636357	0	784636357	24071697
STATIC ROOM A.C.	2400742.02	205899	0	2194843	0	2194843	0
BUILDINGS	**787037099**	**205899**	**0**	**786831201**	**0**	**786831201**	**24071697**
MOTOR VEHICLES	**39295630**	**2837759**	**0**	**36457870**	**0**	**36457870**	**730773**
PL & MACH EDP	23645730	0	0	23645730	0	23645730	0
PL & MACH STOCK	237359	0	0	237359	0	237359	0
PLANT AND MACHINERY	**23883089**	**0**	**0**	**23883089**	**0**	**23883089**	**0**
FURNITURE & OFF. EQUIP.	13437226	59449	0	13377777	0	13377777	307900
ROOM A.C.	4975946	56074	0	4919872	0	4919872	331586
PERSONAL COMPUTER	63415943	10311841	0	53104102	0	53104102	3872758
CYCLOSTYLE MACHINE	1997732	0	0	1997732	0	1997732	76024
ELECTRONIC EQUIPMENT	370206500	0	0	370206500	0	370206500	55489425
FAX MACHINE	1117377	17955	0	1099422	0	1099422	134715
FURNITURE AND OFFICE EQUIPMENTS	**455150724**	**10445320**	**0**	**444705404**	**0**	**444705404**	**60212408**
TOOLS AND EQUIPMENTS	**3130348**	**0**	**0**	**3130348**	**0**	**3130348**	**104617**
SECURITY EQUIPMENTS	**3260388**	**0**	**0**	**3260388**	**0**	**3260388**	**172148**
TOTAL :	**1352886968**	**13488978**	**0**	**1339397990**	**0**	**1339397990**	**85291643**

DEPRECIATION FOR THE YEAR 2015-16

LAND

YEAR	DEP. PROVIDED UPTO	BALANCE YEAR	ASSET USED UPTO THE YEAR	ESTIMATED LIFE OF ASSETS	BAL.YEAR FOR DEP. TO BE PROVIDED	BOOK VALUE AS ON 31.03.2015	IDC	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.15	RATE OF DEP.	DEP. PROVISION FOR YEAR 2015-16	CUMM.DEP. PROVIDED UPTO 2014-15	CUMM. DEP. PROVIDED UPTO 2015-16	REMARK
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
		(2-1)								(7-8-9-/+10)			(11-12-13)		(14*15)		(16+17)	
	2013	2013	50	50	0	22953418	0	0	0	2.3E+07	0	0	2.3E+07	1.80%	0	0	0	
1947	2013	66	50	50	0	60798	0	0	0	60798	0	0	60798	1.80%	0	0	0	
1948	2013	65	50	50	0	416779	0	0	0	416779	0	0	416779	1.80%	0	0	0	

DEPRECIATION FOR THE YEAR 2023-24 LIFE : 50 YRS RATE OF DEP : 1.80%

BUILDING

FR. 1993-94 LIFE : 45 YRS RATE OF DEP : 2%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1946	3689254	0	0	0	3689254	3689254	1.80%	0	3320329	3320329	90
1947	60798	0	0	0	60798	60798	1.80%	0	54718	54718	90
1948	416779	0	0	0	416779	416779	1.80%	0	375101	375101	90
1949	523698	0	0	0	523698	523698	1.80%	0	471328	471328	90
1950	104638	0	0	0	104638	104638	1.80%	0	94174	94174	90
1951	64828	0	0	0	64828	64828	1.80%	0	58345	58345	90
1952	28438	0	0	0	28438	28438	1.80%	0	25594	25594	90
1953	59705	0	0	0	59705	59705	1.80%	0	53735	53735	90
1954	86307	0	0	0	86307	86307	1.80%	0	77676	77676	90
1955	509635	0	0	0	509635	509635	1.80%	0	458672	458672	90
1956	464918	0	0	0	464918	464918	1.80%	0	418426	418426	90
1957	596871	0	0	0	596871	596871	1.80%	0	537184	537184	90
1958	390151	0	0	0	390151	390151	1.80%	0	351136	351136	90
1959	594712	0	0	0	594712	594712	1.80%	0	535241	535241	90
1960	582821	0	0	0	582821	582821	1.80%	0	524539	524539	90
1961	465046	0	0	0	465046	465046	1.80%	0	418541	418541	90
1962	584093	0	0	0	584093	584093	1.80%	0	525684	525684	90
1963	548657	0	0	0	548657	548657	1.80%	0	493791	493791	90
1964	742423	0	0	0	742423	742423	1.80%	0	668181	668181	90
1965	657964	0	0	0	657964	657964	1.80%	0	592168	592168	90
1966	878027	0	0	0	878027	878027	1.80%	0	790224	790224	90
1967	1354879	0	0	0	1354879	1354879	1.80%	0	1219391	1219391	90
1968	1523688	0	0	0	1523688	1523688	1.80%	0	1371319	1371319	90
1969	1988858	0	0	0	1988858	1988858	1.80%	0	1789972	1789972	90
1970	598128	0	0	0	598128	598128	1.80%	0	538315	538315	90
1971	2076824	0	0	0	2076824	2076824	1.80%	0	1869142	1869142	90
1972	1883242	0	0	0	1883242	1883242	1.80%	0	1694918	1694918	90
1973	548044	0	0	0	548044	548044	3.34%	0	493240	493240	90
1974	1762733	0	0	0	1762733	1762733	3.34%	0	1586460	1586460	90
1975	3094136	0	0	0	3094136	3094136	3.34%	0	2784723	2784723	90
1976	729262	0	0	0	729262	729262	3.34%	0	656336	656336	90
1977	1076731	0	0	0	1076731	1076731	3.34%	0	969058	969058	90
1978	942140	0	0	0	942140	942140	3.34%	0	847926	847926	90
1979	1135276	0	0	0	1135276	1135276	3.34%	0	1021748	1021748	90
1980	494826	0	0	0	494826	494826	3.34%	0	445343	445343	90
1981	863390	0	0	0	863390	863390	3.34%	0	777051	777051	90
1982	1900520	0	0	0	1900520	1900520	3.34%	0	1710467	1710467	90
1983	2046003	0	0	0	2046003	2046003	3.34%	21688	1819715	1841403	90
1984	4549574	0	0	0	4549574	4549574	3.34%	130118	3964499	4094617	90
1985	3541022	0	0	0	3541022	3541022	3.34%	118270	3021908	3140178	89
1986	11474970	0	0	0	11474970	11474970	3.34%	383264	9586190	9969454	87
1987	6254060	0	0	0	6254060	6254060	3.34%	208886	5112069	5320954	85
1988	17539190	0	0	0	17539190	17539190	3.34%	585809	14020828	14606637	83
1989	39063097	0	0	0	39063097	39063097	3.34%	1304707	30523904	31828611	81
1990	23074264	0	0	0	23074264	23074264	3.34%	770680	17614893	18385574	80
1991	29057187	0	0	0	29057187	29057187	3.34%	970510	21659227	22629737	78
1992	27386962	0	0	0	27386962	27386962	3.34%	914725	19921276	20836001	76
1993	44715994	0	0	0	44715994	44715994	3.34%	1493514	33420734	34914248	78
1994	54678805	0	0	0	54678805	54678805	3.34%	1826272	39773363	41599635	76
1995	15210779	0	0	0	15210779	15210779	3.34%	508040	10760105	11268145	74
1996	17549616	0	0	0	17549616	17549616	3.34%	586157	12063606	12649763	72
1997	19737275	0	0	0	19737275	19737275	3.34%	659225	13172657	13831882	70
1998	20316674	0	0	0	20316674	20316674	3.34%	678577	13153015	13831592	68
1999	17675030	0	0	0	17675030	17675030	3.34%	590346	11089314	11679660	66
2000	12342068	0	0	0	12342068	12342068	3.34%	412225	7496572	7908797	64
2001	5121950	0	0	0	5121950	5121950	3.34%	171073	3008633	3179707	62
2002	3432871	0	0	0	3432871	3432871	3.34%	114658	1947811	2062469	60
2003	4107328	0	0	0	4107328	4107328	3.34%	137185	2248351	2385536	58
2004	2857785	0	0	0	2857785	2857785	3.34%	95450	1507196	1602646	56
2005	12945755	0	0	0	12945755	12945755	3.34%	432388	6568676	7001064	54
2006	18835475	0	0	0	18835475	18835475	3.34%	629105	9180411	9809515	52
2007	18467732	0	0	0	18467732	18467732	3.34%	616822	8631818	9248640	50
2008	12815056	0	0	0	12815056	12815056	3.34%	428023	5733456	6161479	48
2009	35455280	0	0	0	35455280	35455280	3.34%	1184206	15153587	16337793	46
2010	36732835	0	0	0	36732835	36732835	3.34%	1226877	14964957	16191834	44
2011	35334694	0	0	0	35334694	35334694	3.34%	1180179	12981967	14162145	40
2012	39840121	0	0	0	39840121	39840121	3.34%	1330660	13306600	14637260	37
2013	35295322	0	0	0	35295322	35295322	3.34%	1178864	10609774	11788638	33
2014	13561052	0	0	0	13561052	13561052	3.34%	452939	3623513	4076452	30
2015	35578074	0	0	0	35578074	35578074	3.34%	1188308	8318154	9506462	27
2016	17536579	0	0	0	17536579	17536579	3.34%	585722	3514331	4100052	23
2017	45662057	0	0	0	45662057	45662057	3.34%	1525113	7625563	9150676	20
2018	5571383	0	0	0	5571383	5571383	3.34%	186084	744337	930421	17
2019	8295033	0	0	0	8295033	8295033	3.34%	277054	831163	1108217	13
2020	9121875	0	0	0	9121875	9121875	3.34%	304671	609341	914012	10
2021	27310109	0	0	-6237000	21073109	21073109	3.34%	703842	703842	1407684	7
2022	59729458	0	0	0	59729458	59729458	3.34%	1994964	0	1994964	3
TOTAL :	883842833	0	0	-6237000	877605833	877605833		28107199	430607553	458714752	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 27 YEARS

BUILDING - CASH COLLECTION PORTABI

FROM : 2011 - 12 LIFE : 20 YRS

RATE OF DEP. : 3.34% RATE OF DEP. : 4.50 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10	(11-12-13)		(14*15)		(16+17)	
1973	22844		0	0	22844	22844	3.34%	0	20560	20560	90
2002	110355		0	0	110355	110355	3.34%	3686	90204	93890	85
2003	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2004	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2005	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2006	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2007	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2008	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2009	16267		0	0	16267	16267	3.34%	543	8173	8716	54
2010	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2011	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2012	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2013	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2014	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2015	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2016	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2017	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2018	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2019	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2020	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2021	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
2022	0		0	0	0	0	3.34%	0	0	0	#DIV/0!
TOTAL:	149466		0	0	149466	149466		4229	118936	123165	

DEPRECIATION FOR THE YEAR 2023-24

MOTOR VEHICLES

LIFE : 8 YRS.

RATE OF DEP.: 11.25%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.2023	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1992	162127		0	0	162127	162127	12.86%	0	145914	145914	90
1993	80761		0	0	80761	80761	11.25%	0	72685	72685	90
1994	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
1995	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
1996	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
1997	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
1998	209635		0	0	209635	209635	11.25%	0	188672	188672	90
1999	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
2000	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
2001	1142677		0	0	1142677	1142677	11.25%	0	1028409	1028409	90
2002	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
2003	9049117		1823860	0	7225257	7225257	11.25%	0	6502731	6502731	90
2004	6905758		5527732	0	1378026	1378026	11.25%	0	1240223	1240223	90
2005	3603828		3298966	0	304862	304862	11.25%	0	274376	274376	90
2006	6982199		5339002	0	1643197	1643197	11.25%	0	1478877	1478877	90
2007	20628410		0	0	20628410	20628410	11.25%	0	18565569	18565569	90
2008	13518482		0	0	13518482	13518482	11.25%	0	12166634	12166634	90
2009	33858641		0	0	33858641	33858641	11.25%	0	30472777	30472777	90
2010	6825688		0	0	6825688	6825688	11.25%	0	6143119	6143119	90
2011	10192665		0	0	10192665	10192665	11.25%	0	9173399	9173399	90
2012	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
2013	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
2014	4325118		0	0	4325118	4325118	11.25%	0	3892606	3892606	90
2015	1255040		0	0	1255040	1255040	11.25%	141192	988344	1129536	90
2016	9961570		0	0	9961570	9961570	11.25%	1120677	6724060	7844736	79
2017	2061074		0	0	2061074	2061074	11.25%	231871	1159354	1391225	68
2018	2800000		0	0	2800000	2800000	11.25%	315000	1260000	1575000	56
2019	3199996		0	0	3199996	3199996	11.25%	360000	1079999	1439998	45
2020	1503910		0	0	1503910	1503910	11.25%	169190	338380	507570	34
2021	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
2022	0		0	0	0	0	11.25%	0	0	0	#DIV/0!
TOTAL :	138266695		15989559	0	122277136	122277136		2337929	102896126	105234055	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER: LIFE 17 Y FROM 1993-94

MACHINE TOOLS

FROM : 2011-12 LIFE : 18 Y LIFE : 20 YRS.

RATE OF DEP. : 5.28% RATE OF DEP : 5% RATE OF DEP.: 4.5%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	12	14	15	16	17	18	
					(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1981	0	0	0	0	0	0	0	4.5%	0	0	0	#DIV/0!
1982	120347	0	0	0	120347	0	120347	4.5%	0	108312	108312	90
1983	74164	0	0	0	74164	0	74164	4.5%	0	66748	66748	90
1984	0	0	0	0	0	0	0	4.5%	0	0	0	#DIV/0!
1985	113751	0	0	0	113751	0	113751	4.5%	0	102376	102376	90
1986	0	0	0	0	0	0	0	4.5%	0	0	0	#DIV/0!
1987	662135	0	0	0	662135	0	662135	4.5%	0	595922	595922	90
1988	42938	0	0	0	42938	0	42938	4.5%	0	38644	38644	90
1989	75128	0	0	0	75128	0	75128	4.5%	0	67615	67615	90
1990	134208	0	0	0	134208	0	134208	4.5%	0	120787	120787	90
1991	2414553	0	0	0	2414553	0	2414553	4.5%	0	2173097	2173097	90
1992	1640360	0	0	0	1640360	0	1640360	4.5%	0	1476324	1476324	90
1993	11846632	0	0	0	11846632	0	11846632	5%	0	10661969	10661969	90
1994	1551911	0	0	0	1551911	0	1551911	5%	0	1396720	1396720	90
1995	1305662	0	0	0	1305662	0	1305662	5%	0	1175096	1175096	90
1996	921701	0	0	0	921701	0	921701	5%	0	829531	829531	90
1997	4169286	0	13515	0	4155771	0	4155771	5%	0	3740193	3740193	90
1998	710792	0	0	0	710792	0	710792	5.28%	0	639713	639713	90
1999	15402420	0	0	0	15402420	0	15402420	5.28%	0	13862178	13862178	90
2000	5210392	0	0	0	5210392	0	5210392	5.28%	0	4689353	4689353	90
2001	1526141	0	0	0	1526141	0	1526141	5.28%	0	1373527	1373527	90
2002	244777	0	0	0	244777	0	244777	5.28%	0	220299	220299	90
2003	1180391	0	0	0	1180391	0	1180391	5.28%	0	1062352	1062352	90
2004	1239150	0	93776	0	1145375	0	1145375	5.28%	0	1030837	1030837	90
2005	3973468	0	0	0	3973468	0	3973468	5.28%	0	3576121	3576121	90
2006	8773924	0	0	0	8773924	0	8773924	5.28%	168459	7728072	7896531	90
2007	32475216	0	0	0	32475216	0	32475216	5.28%	1714691	26980409	28695101	88
2008	11360997	0	350999	0	11009998	0	11009998	5.28%	581328	8596607	9177935	83
2009	8692688	0	0	0	8692688	0	8692688	5.28%	458974	6352617	6811591	78
2010	14698424	0	0	0	14698424	0	14698424	5.28%	776077	10006687	10782764	73
2011	53990720	0	0	0	53990720	0	53990720	5.28%	2850710	31357810	34208520	63
2012	27356662	0	0	0	27356662	0	27356662	5.28%	1444432	14444318	15888749	58
2013	3312195	0	0	0	3312195	0	3312195	5.28%	174884	1573955	1748839	53
2014	1786992	0	0	0	1786992	0	1786992	5.28%	94353	754825	849179	48
2015	5292384	0	0	0	5292384	0	5292384	5.28%	279438	1956065	2235503	42
2016	41842236	0	0	0	41842236	0	41842236	5.28%	2209270	13255620	15464890	37
2017	1936615	0	0	0	1936615	0	1936615	5.28%	102253	511266	613520	32
2018	19960167	0	0	0	19960167	0	19960167	5.28%	1053897	4215587	5269484	26
2019	6745466	0	0	0	6745466	0	6745466	5.28%	356161	1068482	1424642	21
2020	56885739	0	0	0	56885739	0	56885739	5.28%	3003567	6007134	9010701	16
2021	47143715	0	0	1490942	48634657	0	48634657	5.28%	2567910	2567910	5135820	11
2022	5716436	0	0	0	5716436	0	5716436	5.28%	301828	0	301828	5
TOTAL :	402530882		458290	1490942	403563535	0	403563535		18138231	186385079	204523310	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 14 YEARS FROM 1993-94

FURNITURE

FROM : 2011-12 LIFE : 18 YRS LIFE : 20 YRS.

RATE OF DEP. : 6.33% RATE OF DEP : 5% RATE OF DEP.: 4.5%

YEAR	BOOK VALUE AS ON 31.03.2023	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 01.04.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1975	0		0	0	0	0	4.5%	0	0	0	#DIV/0!
1976	15914		0	0	15914	15914	4.5%	0	14323	14323	90
1977	0		0	0	0	0	4.5%	0	0	0	#DIV/0!
1978	21368		0	0	21368	21368	4.5%	0	19231	19231	90
1979	21532		0	0	21532	21532	4.5%	0	19379	19379	90
1980	8115		0	0	8115	8115	4.5%	0	7304	7304	90
1981	4905		0	0	4905	4905	4.5%	0	4415	4415	90
1982	14290		0	0	14290	14290	4.5%	0	12861	12861	90
1983	-18421		0	0	-18421	-18421	4.5%	0	-16579	-16579	90
1984	122294		0	0	122294	122294	4.5%	0	110065	110065	90
1985	80338		0	0	80338	80338	4.5%	0	72304	72304	90
1986	44960		0	0	44960	44960	4.5%	0	40464	40464	90
1987	86009		0	0	86009	86009	4.5%	0	77408	77408	90
1988	101599		0	0	101599	101599	4.5%	0	91439	91439	90
1989	165429		0	0	165429	165429	4.5%	0	148886	148886	90
1990	6115		0	0	6115	6115	4.5%	0	5504	5504	90
1991	66216		0	0	66216	66216	4.5%	0	59594	59594	90
1992	101562		0	0	101562	101562	4.5%	0	91406	91406	90
1993	-11336		0	0	-11336	-11336	5%	0	-10202	-10202	90
1994	0		0	0	0	0	5%	0	0	0	#DIV/0!
1995	0		0	0	0	0	5%	0	0	0	#DIV/0!
1996	0		0	0	0	0	5%	0	0	0	#DIV/0!
1997	0		0	0	0	0	6.33%	0	0	0	#DIV/0!
1998	0		0	0	0	0	6.33%	0	0	0	#DIV/0!
1999	9526		0	0	9526	9526	6.33%	0	8574	8574	90
2000	0		0	0	0	0	6.33%	0	0	0	#DIV/0!
2001	3067810		0	0	3067810	3067810	6.33%	0	2761028	2761028	90
2002	0		0	0	0	0	6.33%	0	0	0	#DIV/0!
2003	2800652		0	0	2800652	2800652	6.33%	0	2520586	2520586	90
2004	12712684		0	0	12712684	12712684	6.33%	0	11441416	11441416	90
2005	534620		0	0	534620	534620	6.33%	0	481158	481158	90
2006	236228		0	0	236228	236228	6.33%	0	212605	212605	90
2007	154750		0	0	154750	154750	6.33%	0	139275	139275	90
2008	1018747		0	0	1018747	1018747	6.33%	3769	913103	916872	90
2009	0		0	0	0	0	6.33%	0	0	0	#DIV/0!
2010	375247		0	0	375247	375247	6.33%	23753	298809	322562	86
2011	0		0	0	0	0	6.33%	0	0	0	#DIV/0!
2012	1535968		0	0	1535968	1535968	6.33%	97227	972268	1069495	70
2013	12431		0	0	12431	12431	6.33%	787	7082	7869	63
2014	61875		0	0	61875	61875	6.33%	3917	31334	35250	57
2015	172655		0	0	172655	172655	6.33%	10929	76503	87432	51
2016	99675		0	0	99675	99675	6.33%	6309	37857	44166	44
2017	472000		0	0	472000	472000	6.33%	29878	149388	179266	38
2018	1710892		0	0	1710892	1710892	6.33%	108299	433198	541497	32
2019	814380		0	0	814380	814380	6.33%	51550	154651	206201	25
2020	41814		0	0	41814	41814	6.33%	2647	5294	7940	19
2021	403522		0	0	403522	403522	6.33%	25543	25543	51086	13
2022	839737		0	0	839737	839737	6.33%	53155	0	53155	6
TOTAL:	27906103		0	0	27906103	27906103		417763	21417471	21835234	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 9 YEARS FROM : 2011-12 RATE OF DEP. : 9.50%

FROM 1993-94 LIFE : 5 YRS RATE IF DEP : 18%

LIFE : 7 YRS. RATE OF DEP.: 12.86 %

ROOM A.C.

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1992	228939	0	14041	0	214898	214898	12.86%	0	193408	193408	90
1993	207916	0	0	0	207916	207916	18%	0	187125	187125	90
1994	232437	0	21490	0	210947	210947	18%	0	189852	189852	90
1995	468919	0	183161	0	285758	285758	18%	0	257182	257182	90
1996	142381	0	0	0	142381	142381	18%	0	128143	128143	90
1997	252849	0	22756	0	230093	230093	18%	0	207084	207084	90
1998	670244	0	0	0	670244	670244	18%	0	603220	603220	90
1999	126006	0	33355	0	92651	92651	18%	0	83386	83386	90
2000	58024	0	0	0	58024	58024	18%	0	52221	52221	90
2001	2321960	0	70413	0	2251547	2251547	18%	0	2026392	2026392	90
2002	15631	0	0	0	15631	15631	18%	0	14068	14068	90
2003	593263	0	0	0	593263	593263	18%	0	533937	533937	90
2004	296297	0	25874	0	270423	270423	18%	0	243380	243380	90
2005	152370	0	0	0	152370	152370	18%	0	137133	137133	90
2006	311246	0	0	0	311246	311246	18%	0	280121	280121	90
2007	2260261	0	40800	0	2219461	2219461	18%	0	1997515	1997515	90
2008	2879983	0	43940	0	2836043	2836043	18%	0	2552439	2552439	90
2009	1258115	0	0	0	1258115	1258115	9.50%	0	1132304	1132304	90
2010	0	0	0	0	0	0	9.50%	0	0	0	#DIV/0!
2011	1287285	0	0	0	1287285	1287285	9.50%	0	1158557	1158557	90
2012	450029	0	0	0	450029	450029	9.50%	0	405027	405027	90
2013	605073	0	0	0	605073	605073	9.50%	27228	517337	544565	90
2014	297587	0	0	0	297587	297587	9.50%	28271	226166	254437	86
2015	48500	0	0	0	48500	48500	9.50%	4608	32253	36860	76
2016	3181007	0	0	0	3181007	3181007	9.50%	302196	1813174	2115370	67
2017	2842320	0	0	0	2842320	2842320	9.50%	270020	1350102	1620122	57
2018	1128582	0	0	0	1128582	1128582	9.50%	107215	428861	536076	48
2019	572485	0	0	0	572485	572485	9.50%	54386	163158	217544	38
2020	0	0	0	0	0	0	9.50%	0	0	0	#DIV/0!
2021	1603066	0	0	0	1603066	1603066	9.50%	152291	152291	304582	19
2022	2571143	0	0	0	2571143	2571143	9.50%	244259	0	244259	10
TOTAL :	27063917	0	455830	0	26608088	26608088		1190473	17065836	18256310	

DEPRECIATION FOR THE YEAR 2023-24 | MERC ORDER : LIFE 6 YRS. | LIFE : 7 YRS. | RATE OF DEP.: 12.86 %

PERSONAL COMPUTER

FROM : 2011-12 | FROM : 1993-94 | LIFE : 5 YRS. | RATE OF DEP.: 18 %

ROD : 15%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	3	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1995	55826	0	0	0	55826	55826	12.86%	0	50243	50243	90
1996	508997	0	0	0	508997	508997	12.86%	0	458097	458097	90
1997	3329768	0	0	0	3329768	3329768	12.86%	0	2996791	2996791	90
1998	506157	0	0	0	506157	506157	12.86%	0	455541	455541	90
1999	1254293	0	0	0	1254293	1254293	12.86%	0	1128864	1128864	90
2000	3570148	0	0	0	3570148	3570148	12.86%	0	3213133	3213133	90
2001	1898348	0	0	0	1898348	1898348	12.86%	0	1708513	1708513	90
2002	10600501	0	0	0	10600501	10600501	12.86%	0	9540451	9540451	90
2003	6406342	0	0	0	6406342	6406342	12.86%	0	5765708	5765708	90
2004	2179076	0	0	0	2179076	2179076	12.86%	0	1961168	1961168	90
2005	347401	0	66906	0	280495	280495	15%	0	252446	252446	90
2006	20190165	0	0	0	20190165	20190165	15%	0	18171149	18171149	90
2007	4860578	0	0	0	4860578	4860578	15%	0	4374520	4374520	90
2008	3243490	0	265872	0	2977618	2977618	15%	0	2679856	2679856	90
2009	23767706	0	439181	0	23328525	23328525	15%	0	20995672	20995672	90
2010	24816121	0	1447830	0	23368291	23368291	15%	0	21031462	21031462	90
2011	10507430	0	496610	0	10010820	10010820	15%	0	9009738	9009738	90
2012	8052514.2	0	1075665	0	6976849	6976849	15%	0	6279164	6279164	90
2013	6311088.6	0	874226	0	5436862	5436862	15%	0	4893177	4893177	90
2014	763834	0	291552	0	472282	472282	15%	0	425054	425054	90
2015	1955823	0	0	0	1955823	1955823	15%	0	1760241	1760241	90
2016	13156591	0	10441	0	13146150	13146150	15%	0	11831535	11831535	90
2017	1391934	0	0	0	1391934	1391934	15%	208790	1043950	1252740	90
2018	17495482	0	0	0	17495482	17495482	15%	2624322	10497289	13121611	75
2019	6976048	0	0	0	6976048	6976048	15%	1046407	3139222	4185629	60
2020	9678856	0	0	0	9678856	9678856	15%	1451828	2903657	4355485	45
2021	4261218	0	0	0	4261218	4261218	15%	639183	639183	1278366	30
2022	10758107	0	0	0	10758107	10758107	15%	1613716	0	1613716	15
TOTAL :	198843842	0	4968283	0	193875559	193875559.3		7584247	147205823	154790069	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 6 YEARS

ELECTRONIC EQUIPMENTS (SEPERA

FROM : 2011-12 LIFE : 12 YRS.

RATE OF DEP.: 15% RATE OF DEP.: 7.5 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1991	697248	0	0	0	697248	697248	7.5%	0	627523	627523	90
1992	537281	0	0	0	537281	537281	7.5%	0	483553	483553	90
1993	285348	0	0	0	285348	285348	7.5%	0	256813	256813	90
1994	0	0	0	0	0	0	7.5%	0	0	0	#DIV/0!
1995	0	0	0	0	0	0	7.5%	0	0	0	#DIV/0!
1996	963206	0	0	0	963206	963206	7.5%	0	866886	866886	90
1997	38331	0	0	0	38331	38331	7.5%	0	34498	34498	90
1998	0	0	0	0	0	0	7.5%	0	0	0	#DIV/0!
1999	729367	0	0	0	729367	729367	7.5%	0	656430	656430	90
2000	138818	0	0	0	138818	138818	7.5%	0	124936	124936	90
2001	0	0	0	0	0	0	7.5%	0	0	0	#DIV/0!
2002	0	0	0	0	0	0	7.5%	0	0	0	#DIV/0!
2003	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2004	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2005	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2006	60451	0	0	0	60451	60451	15%	0	54406	54406	90
2007	780567	0	0	0	780567	780567	15%	0	702510	702510	90
2008	37500	0	0	0	37500	37500	15%	0	33750	33750	90
2009	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2010	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2011	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2012	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2013	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2014	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	24995	0	0	0	24995	24995	15%	0	22496	22496	90
2016	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2017	332628	0	0	0	332628	332628	15%	49894	249471	299365	90
2018	99199	0	0	0	99199	99199	15%	14880	59519	74399	75
2019	101200	0	0	0	101200	101200	15%	15180	45540	60720	60
2020	554719	0	0	0	554719	554719	15%	83208	166416	249624	45
2021	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2022	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	5380858	0	0	0	5380858	5380858		163162	4384747	4547909	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 6 YEARS

ELECTRONIC EQUIPMENTS (SEPERATED FRC

EFFECTIVE FROM 2011-12 LIFE : 12 YRS.

RATE OF DEP : 15% RATE OF DEP.: 7.5 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1994	885814		0	0	885814	885814	7.50%	0	797233	797233	90
1995	396816		0	0	396816	396816	7.50%	0	357134	357134	90
1996	90664		0	0	90664	90664	7.50%	0	81598	81598	90
1997	0		0	0	0	0	7.50%	0	0	0	#DIV/0!
1998	0		0	0	0	0	7.50%	0	0	0	#DIV/0!
1999	4615618		0	0	4615618	4615618	7.50%	0	4154056	4154056	90
2000	0		0	0	0	0	7.50%	0	0	0	#DIV/0!
2001	3271811		0	0	3271811	3271811	7.50%	0	2944630	2944630	90
2002	0		0	0	0	0	7.50%	0	0	0	#DIV/0!
2003	0		0	0	0	0	15%	0	0	0	#DIV/0!
2004	0		0	0	0	0	15%	0	0	0	#DIV/0!
2005	0		0	0	0	0	15%	0	0	0	#DIV/0!
2006	0		0	0	0	0	15%	0	0	0	#DIV/0!
2007	838761		0	0	838761	838761	15%	0	754885	754885	90
2008	6940844		0	0	6940844	6940844	15%	0	6246760	6246760	90
2009	0		0	0	0	0	15%	0	0	0	#DIV/0!
2010	0		0	0	0	0	15%	0	0	0	#DIV/0!
2011	0		0	0	0	0	15%	0	0	0	#DIV/0!
2012	0		0	0	0	0	15%	0	0	0	#DIV/0!
2013	0		0	0	0	0	15%	0	0	0	#DIV/0!
2014	0		0	0	0	0	15%	0	0	0	#DIV/0!
2015	0		0	0	0	0	15%	0	0	0	#DIV/0!
2016	0		0	0	0	0	15%	0	0	0	#DIV/0!
2017	0		0	0	0	0	15%	0	0	0	#DIV/0!
2018	1194160		0	0	1194160	1194160	15%	179124	716496	895620	75
2019	5165947		0	858082	6024029	6024029	15%	903604	2710813	3614417	60
2020	3496489		0	0	3496489	3496489	15%	524473	1048947	1573420	45
2021	522150		0	0	522150	522150	15%	78323	78323	156645	30
2022	0		0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	27419074		0	858082	28277156	2.8E+07		1685524	19890873	#######	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 6 YEARS

CYCLOSTYLE MACHINE

EFFECTIVE FROM : 2011-12 LIFE : 10 YRS.

RATE OF DEP : 15% RATE OF DEP.: 9 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1999	407910		0	0	407910	407910	9%	0	367119	367119	90
2000	65966		0	0	65966	65966	9%	0	59369	59369	90
2001	0		0	0	0	0	9%	0	0	0	#DIV/0!
2002	0		0	0	0	0	9%	0	0	0	#DIV/0!
2003	329227		0	0	329227	329227	9%	0	296304	296304	90
2004	90664		0	0	90664	90664	9%	0	81598	81598	90
2005	0		0	0	0	0	15%	0	0	0	#DIV/0!
2006	0		0	0	0	0	15%	0	0	0	#DIV/0!
2007	304874		0	0	304874	304874	15%	0	274388	274388	90
2008	0		0	0	0	0	15%	0	0	0	#DIV/0!
2009	0		0	0	0	0	15%	0	0	0	#DIV/0!
2010	0		0	0	0	0	15%	0	0	0	#DIV/0!
2011	0		0	0	0	0	15%	0	0	0	#DIV/0!
2012	0		0	0	0	0	15%	0	0	0	#DIV/0!
2013	0		0	0	0	0	15%	0	0	0	#DIV/0!
2014	0		0	0	0	0	15%	0	0	0	#DIV/0!
2015	0		0	0	0	0	15%	0	0	0	#DIV/0!
2016	229909		0	0	229909	229909	15%	0	206918	206918	90
2017	0		0	0	0	0	15%	0	0	0	#DIV/0!
2018	0		0	0	0	0	15%	0	0	0	#DIV/0!
2019	0		0	0	0	0	15%	0	0	0	#DIV/0!
2020	0		0	0	0	0	15%	0	0	0	#DIV/0!
2021	0		0	0	0	0	15%	0	0	0	#DIV/0!
2022	0		0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	1428550		0	0	1428550	1428550		0	1285696	1285696	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 17 YEARS
FROM 2011-12
RATE OF DEP : 5.28 %

LIFE : 40 YRS. RATE OF DEP.: 2.25 %
FROM 1994-95 : LIFE 35 YRS RATE OF DEP.: 2.57 %

CABLE AND MAINS

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	12	13	14	15	16	17	18	
					(7-8-9-/+10)			(11-12-13)		(14*15)		(16+17)	
1972	9262163	0	9262163	0	0	0	0	0	2.25%	0	0	0	#DIV/0!
1973	8388173	0	0	0	8388173	0	0	8388173	2.25%	0	7549356	7549356	90
1974	9775861	0	0	0	9775861	0	0	9775861	2.25%	0	8798275	8798275	90
1975	11717400	0	0	0	11717400	0	0	11717400	2.25%	0	10545660	10545660	90
1976	12169915	0	0	0	12169915	0	0	12169915	2.25%	0	10952924	10952924	90
1977	10555702	0	0	0	10555702	0	0	10555702	2.25%	0	9500132	9500132	90
1978	15618582	0	0	0	15618582	0	0	15618582	2.25%	0	14056724	14056724	90
1979	16167097	0	0	0	16167097	0	0	16167097	2.25%	0	14550387	14550387	90
1980	17141932	0	0	0	17141932	0	0	17141932	2.25%	0	15427739	15427739	90
1981	38669778	0	0	0	38669778	0	0	38669778	5.28%	0	34802800	34802800	90
1982	20135132	0	0	0	20135132	0	0	20135132	5.28%	0	18121619	18121619	90
1983	32013692	0	0	0	32013692	0	0	32013692	5.28%	0	28812323	28812323	90
1984	56205363	0	0	0	56205363	0	0	56205363	5.28%	0	50584827	50584827	90
1985	20951406	0	0	0	20951406	0	0	20951406	5.28%	0	18856265	18856265	90
1986	25666672	0	0	0	25666672	0	0	25666672	5.28%	0	23100005	23100005	90
1987	29320556	0	0	0	29320556	0	0	29320556	5.28%	0	26388500	26388500	90
1988	42934990	0	0	0	42934990	0	0	42934990	5.28%	0	38641490	38641490	90
1989	51170798	0	0	0	51170798	0	0	51170798	5.28%	0	46053718	46053718	90
1990	112338620	0	0	0	112338620	0	0	112338620	5.28%	0	101104758	101104758	90
1991	117991103	0	0	0	117991103	0	0	117991103	5.28%	0	106191993	106191993	90
1992	161085823	0	0	0	161085823	0	0	161085823	5.28%	0	144977241	144977241	90
1993	188440938	0	0	0	188440938	0	0	188440938	5.28%	0	169596844	169596844	90
1994	103116417	0	0	0	103116417	0	0	103116417	5.28%	0	92804775	92804775	90
1995	136271320	0	0	0	136271320	0	0	136271320	5.28%	0	122644188	122644188	90
1996	165331500	0	0	0	165331500	0	0	165331500	5.28%	0	148798350	148798350	90
1997	133851938	0	0	0	133851938	0	0	133851938	5.28%	0	120466744	120466744	90
1998	180219938	0	0	0	180219938	0	0	180219938	5.28%	0	162197944	162197944	90
1999	199606604	0	0	0	199606604	0	0	199606604	5.28%	0	179645943	179645943	90
2000	185817677	0	0	0	185817677	0	0	185817677	5.28%	2006831	165229078	167235909	90
2001	231338388	0	0	0	231338388	0	0	231338388	5.28%	8443851	199760698	208204549	90
2002	134074537	0	0	0	134074537	0	0	134074537	5.28%	7079136	112327647	119406783	89
2003	137624296	0	0	0	137624296	24900000	0	112724296	5.28%	5951843	91543401	97495244	86
2004	147542001	0	0	0	147542001	45000000	0	102542001	5.28%	5414218	80639030	86053247	84
2005	189880044	0	0	0	189880044	30478000	31203547	128198497	5.28%	6768881	97520597	104289477	81
2006	185714645	0	0	0	185714645	52500000	63603184	69611461	5.28%	3675485	51164424	54839909	79
2007	328836997	0	0	0	328836997	0	87843484	240993513	5.28%	12724457	170936699	183661156	76
2008	339749784	0	0	0	339749784	14500000	97282148	227967636	5.28%	12036691	155838676	167875367	74
2009	633684236	0	0	0	633684236	7700000	111065274	514918962	5.28%	27187721	338765185	365952906	71
2010	648019778	0	0	0	648019778	0	95892048	552127730	5.28%	29152344	349055151	378207495	69
2011	547276581	0	0	0	547276581	0	77752227	469524354	5.28%	24790886	272699745	297490631	63
2012	437999829	0	0	0	437999829	0	83678305	354321524	5.28%	18708176	187081765	205789941	58
2013	454864867	0	0	0	454864867	0	82438615	372426252	5.28%	19664106	176976955	196641061	53
2014	760370625	0	0	0	760370625	0	97996029	662374596	5.28%	34973379	279787029	314760408	48
2015	630618543	0	0	0	630618543	0	100652529	529966014	5.28%	27982206	195875439	223857644	42
2016	612149371	0	0	0	612149371	0	100566763	511582608	5.28%	27011562	162069370	189080932	37
2017	433581675	0	0	0	433581675	0	121227194	312354481	5.28%	16492317	82461583	98953900	32
2018	860376873	0	0	0	860376873	95036460	106947375	658393037	5.28%	34763152	139052610	173815762	26
2019	869730250	0	0	0	869730250	114865195	77581531	677283524	5.28%	35760570	107281711	143042281	21
2020	768300622	0	0	0	768300622	0	60924424	707376198	5.28%	37349463	74698927	112048390	16
2021	525915069	0	0	-446475	525468594	0	77143777	448324817	5.28%	23671550	23671550	47343101	11
2022	768863899	1650577	0	0	770514475	0	103512073	667002402	5.28%	35217727	0	35217727	5
										0			
TOTAL :	12758450000	1650577	9262163	-446475	12750391938	384979655	1577310527	10788101756		456826552	5239608791	5696435343	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER: LIFE 17 LIFE : 20 YEARS RATE OF DEP.: 4.50 %

DISTRIBUTION PILLARS

FROM 2011-12

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	11	12	14	15	16	17	18	
				(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1989	0	0	0	0	0	0	4.50%	0	0	0	#DIV/0!
1990	1859890	0	0	1859890	0	1859890	4.50%	0	1673901	1673901	90
1991	1510334	0	0	1510334	0	1510334	4.50%	0	1359301	1359301	90
1992	1839164	0	0	1839164	0	1839164	4.50%	0	1655248	1655248	90
1993	2617322	0	0	2617322	0	2617322	4.50%	0	2355590	2355590	90
1994	1937445	0	0	1937445	0	1937445	4.50%	0	1743701	1743701	90
1995	2480417	0	0	2480417	0	2480417	4.50%	0	2232375	2232375	90
1996	3896967	0	0	3896967	0	3896967	4.50%	0	3507270	3507270	90
1997	3568872	0	0	3568872	0	3568872	5.28%	0	3211985	3211985	90
1998	5263200	0	0	5263200	0	5263200	5.28%	0	4736880	4736880	90
1999	5023996	0	0	5023996	0	5023996	5.28%	0	4521596	4521596	90
2000	8952039	0	0	8952039	0	8952039	5.28%	0	8056835	8056835	90
2001	11045685	0	0	11045685	0	11045685	5.28%	0	9941117	9941117	90
2002	10263557	0	0	10263557	0	10263557	5.28%	0	9237202	9237202	90
2003	14227114	0	0	14227114	0	14227114	5.28%	0	12804403	12804403	90
2004	14570359	0	0	14570359	0	14570359	5.28%	0	13113322	13113322	90
2005	10024180	0	0	10024180	2177000	7847180	5.28%	32958	7029504	7062462	90
2006	12868740	0	0	12868740	5000000	7868740	5.28%	387142	6694724	7081866	90
2007	16574814	0	0	16574814	0	16574814	5.28%	875150	13355985	14231135	86
2008	13378282	0	0	13378282	0	13378282	5.28%	706373	10178197	10884570	81
2009	17672674	0	0	17672674	0	17672674	5.28%	933117	12650100	13583217	77
2010	10932739	0	0	10932739	0	10932739	5.28%	577249	7333681	7910930	72
2011	35492854	0	0	35492854	0	35492854	5.28%	1874023	20614249	22488272	63
2012	22743279	0	0	22743279	0	22743279	5.28%	1200845	12008451	13209296	58
2013	15964974	0	0	15964974	0	15964974	5.28%	842951	7586556	8429506	53
2014	15629790	0	0	15629790	0	15629790	5.28%	825253	6602023	7427276	48
2015	16483950	0	0	16483950	0	16483950	5.28%	870353	6092468	6962820	42
2016	18620147	0	0	18620147	0	18620147	5.28%	983144	5898862	6882006	37
2017	16764406	0	0	16764406	0	16764406	5.28%	885161	4425803	5310964	32
2018	22435692	0	0	22435692	0	22435692	5.28%	1184605	4738418	5923023	26
2019	17805956	0	0	17805956	924520	16881436	5.28%	891340	2674019	3565359	21
2020	18179881	0	0	18179881	0	18179881	5.28%	959898	1919795	2879693	16
2021	24422597	0	0	24422597	0	24422597	5.28%	1289513	959898	2249411	9
2022	41163047	0	0	41163047	0	41163047	5.28%	0	0	0	5
TOTAL :	436214362	0	0	436214361.6	8101520	428112842		#######	210913460	226232533	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 17 YEARS LIFE : 15 YEARS RATE OF DEP.: 6 %

STREET LIGHTING LAMPS

FROM 2011-12

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISI ON FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	11	12	14	15	16	17	18	
				(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1971	375761	0	0	375761	0	375761	6%	0	338185	338185	90
1972	1177831	0	0	1177831	0	1177831	6%	0	1060048	1060048	90
1973	850089	0	0	850089	0	850089	6%	0	765080	765080	90
1974	1567871	0	0	1567871	0	1567871	6%	0	1411084	1411084	90
1975	1299075	0	0	1299075	0	1299075	6%	0	1169168	1169168	90
1976	2212095	0	0	2212095	0	2212095	6%	0	1990886	1990886	90
1977	1602022	0	0	1602022	0	1602022	6%	0	1441820	1441820	90
1978	1525598	0	0	1525598	0	1525598	6%	0	1373038	1373038	90
1979	2499870	0	0	2499870	0	2499870	6%	0	2249883	2249883	90
1980	2002230	0	0	2002230	0	2002230	6%	0	1802007	1802007	90
1981	2051265	0	0	2051265	0	2051265	6%	0	1846139	1846139	90
1982	1782839	0	0	1782839	0	1782839	6%	0	1604555	1604555	90
1983	3226813	0	0	3226813	0	3226813	6%	0	2904132	2904132	90
1984	707349	0	0	707349	0	707349	6%	0	636614	636614	90
1985	2274839	0	0	2274839	0	2274839	6%	0	2047355	2047355	90
1986	3203576	0	0	3203576	0	3203576	6%	0	2883218	2883218	90
1987	1281264	0	0	1281264	0	1281264	6%	0	1153138	1153138	90
1988	1490104	0	0	1490104	0	1490104	6%	0	1341094	1341094	90
1989	1678337	0	0	1678337	0	1678337	6%	0	1510503	1510503	90
1990	2508215	0	0	2508215	0	2508215	6%	0	2257394	2257394	90
1991	1436087	0	0	1436087	0	1436087	6%	0	1292478	1292478	90
1992	11847318	0	0	11847318	0	11847318	6%	0	10662586	10662586	90
1993	13353615	0	0	13353615	0	13353615	6%	0	12018254	12018254	90
1994	14030878	0	0	14030878	0	14030878	6%	0	12627790	12627790	90
1995	19405026	0	0	19405026	0	19405026	6%	0	17464523	17464523	90
1996	9675990	0	0	9675990	0	9675990	6%	0	8708391	8708391	90
1997	35435043	0	0	35435043	0	35435043	6%	0	31891539	31891539	90
1998	46681393	0	0	46681393	0	46681393	6%	0	42013254	42013254	90
1999	20891589	0	0	20891589	0	20891589	6%	0	18802430	18802430	90
2000	24031153	0	0	24031153	0	24031153	6%	0	21628038	21628038	90
2001	34093868	0	0	34093868	0	34093868	5.28%	0	30684481	30684481	90
2002	48386819	0	0	48386819	0	48386819	5.28%	0	43548137	43548137	90
2003	18891836	0	0	18891836	0	18891836	5.28%	0	17002652	17002652	90
2004	29098079	0	0	29098079	0	29098079	5.28%	0	26188272	26188272	90
2005	11575967	0	0	11575967	0	11575967	5.28%	0	10418371	10418371	90
2006	10808482	0	0	10808482	0	10808482	5.28%	0	9727634	9727634	90
2007	3051851	0	0	3051851	0	3051851	5.28%	58596	2688070	2746666	90
2008	7663048	0	0	7663048	0	7663048	5.28%	404609	6289830	6694439	87
2009	13592326	0	0	13592326	0	13592326	5.28%	717675	10341042	11058716	81
2010	16304978	0	0	16304978	0	16304978	5.28%	860903	11426529	12287431	75
2011	16338193	0	0	16338193	0	16338193	5.28%	862657	9489222	10351879	63
2012	7088085	0	0	7088085	0	7088085	5.28%	374251	3742509	4116760	58
2013	5556338	0	0	5556338	0	5556338	5.28%	293375	2640372	2933746	53
2014	48578223	0	0	48578223	0	48578223	5.28%	2564930	20519441	23084372	48
2015	15569846	0	0	15569846	0	15569846	5.28%	822088	5754615	6576703	42
2016	18235339	0	0	18235339	0	18235339	5.28%	962826	5776955	6739781	37
2017	18077317	0	0	18077317	0	18077317	5.28%	954482	4772412	5726894	32
2018	368275181	0	0	368275181	73815497	294459684	5.28%	#######	62189885	77737357	26
2019	553783762	0	0	553783762	185730094	368053668	5.28%	#######	58299701	77732935	21
2020	49874571	0	0	49874571	0	49874571	5.28%	2633377	5266755	7900132	16
2021	95876543	0	0	95876543	0	95876543	5.28%	5062281	5062281	10124563	11
2022	58807951	0	0	58807951	0	58807951	5.28%	3105060	0	3105060	5
TOTAL :	1681633737	0	0	1681633737	259545591	1422088146		#######	560723787	615381601	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 17 YEARS LIFE : 15 YEARS RATE OF DEP.: 6 %

METERS (CONVENTIONAL)

FROM 2011-12

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	11	12	14	15	16	17	18	
				(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1999	31839079	0	20811105	11027974	0	11027974	6%	0	9925177	9925177	90
2000	45007000	0	0	45007000	0	45007000	6%	0	40506300	40506300	90
2001	49820192	0	0	49820192	0	49820192	5.28%	0	44838173	44838173	90
2002	26588512	0	0	26588512	0	26588512	5.28%	0	23929660	23929660	90
2003	45752708	0	0	45752708	8200000	37552708	5.28%	0	33797437	33797437	90
2004	26813967	0	0	26813967	8200000	18613967	5.28%	0	16752570	16752570	90
2005	33382472	0	0	33382472	7075000	26307472	5.28%	0	23676725	23676725	90
2006	52581078	0	0	52581078	2.4E+07	28831078	5.28%	0	25947970	25947970	90
2007	28461442	0	0	28461442	0	28461442	5.28%	546460	25068838	25615298	90
2008	14912906	0	0	14912906	3000000	11912906	5.28%	629001	9778113	10407115	87
2009	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2010	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2011	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2022	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	355159356	0	20811105	334348251	#######	284123251		1175461	254220964	255396425	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 8 YEARS LIFE : 15 YEARS RATE OF DEP.: 6 %

METERS (ELECTRONIC)

FROM 2011-12 22-23 LIFE 10 YRS RATE OF DEP. : 9%

RATE OF DEP : 11.25 %

YEAR	BOOK VALUE AS ON 01.04.2022	WRITE OFF DURING THE YEAR 2022-23	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	9	11	12	14	15	16	17	18	
			(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
2000	0	0	0	0	0	6%	0	0	0	0
2001	24021622	6266587	17755034	0	17755034	11.25%	0	15979531	15979531	90
2002	40255448	8493649	31761799	0	31761799	11.25%	0	28585617	28585617	90
2003	10181565	4509919	5671647	12800000	-7128353	11.25%	0	-6415518	-6415518	90
2004	50587402	0	50587402	25600000	24987402	11.25%	0	22488661	22488661	90
2005	15236100	402047	14834053	7075000	7759053	11.25%	0	6983148	6983148	90
2006	13829170	3283337	10545833	23750000	-13204167	11.25%	0	-11883750	-11883750	90
2007	6154881	57045	6097836	0	6097836	11.25%	0	5488052	5488052	90
2008	2876447	3572637	-696190	3000000	-3696190	11.25%	0	-3326571	-3326571	90
2009	14375447	9080268	5295179	2000000	3295179	11.25%	0	2965660	2965660	90
2010	36330913	4977204	31353709	0	31353709	11.25%	0	28218339	28218339	90
2011	0	0	0	0	0	11.25%	0	0	0	90
2012	115860406	22804471	93055935	0	93055935	11.25%	0	83750341	83750341	90
2013	96363994	37920	96326074	0	96326074	11.25%	0	86693466	86693466	90
2014	109948014	5161401	104786612	0	104786612	11.25%	0	94307951	94307951	90
2015	72538033	2162512	70375521	0	70375521	11.25%	7917246	55420723	63337969	90
2016	92771671	2387739	90383933	0	90383933	11.25%	10409951	61009154	71419105	79
2017	98678058	452400	98225658	0	98225658	11.25%	11050387	55251933	66302319	67
2018	122032406	445058	121587348	41720343	79867005	11.25%	8985038	35940152	44925190	56
2019	178796310	289927	178506382	32942044	145564338	11.25%	16375988	49127964	65503952	45
2020	62960296	275840	62684456	0	62684456	11.25%	7052001	14104003	21156004	34
2021	146232442	142717	146089725	0	146089725	9.00%	13148075	13148075	26296150	18
2022	10273216	0	10273216	0	10273216	9.00%	924589	0	924589	9
TOTAL :	1320303840	74802679	1245501161	148887387	1096613774		75863276	637836934	713700210	

DEPRECIATION FOR THE YEAR 2023-24 LIFE : 6 YEARS RATE OF DEP.: 15 %

BUSINESS PROCESS AUTOMATION

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
2010	316100000	0	0	0	316100000	316100000	15%	0	284490000	284490000	90
2011	39532722	0	0	0	39532722	39532722	15%	0	35579450	35579450	90
2012	64685052	0	0	0	64685052	64685052	15%	0	58216547	58216547	90
2013	60000000	0	0	0	60000000	60000000	15%	0	54000000	54000000	90
2014	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2015	8342289	0	0	0	8342289	8342289	15%	0	7508060	7508060	90
2016	187500	0	0	0	187500	187500	15%	0	168750	168750	90
2017	75000	0	0	0	75000	75000	15%	11250	56250	67500	90
2018	1754025	0	0	0	1754025	1754025	15%	263104	1052415	1315519	75
2019	1017066	0	0	0	1017066	1017066	15%	152560	457680	610240	60
2020	3875066	0	0	0	3875066	3875066	15%	581260	1162520	1743780	45
2021	4764983	0	0	0	4764983	4764983	15%	714747	714747	1429495	30
2022	290822	0	0	0	290822	290822	15%	43623	0	43623	15
TOTAL :	500624525	0	0	0	500624525	500624525		1766544	443406419	445172963	

DEPRECIATION FOR THE YEAR 2023-24 — MERC ORDER : LIFE 17 YEARS — FROM 1994-95 LIFE : 25 YEARS — PAST : 1947 LIFE : 20 YEARS

SWITCHGEARS

FROM 2011-12 — RATE OF DEP : 3.60% — RATE OF DEP : 4.50 %

RATE OF DEP : 5.28 %

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.2023	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	12	14	15	16	17	18	
					(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1966	2178431	0	0	0	2178431	0	2178431	4.50%	0	1960587	1960587	90
1967	1447202	0	0	0	1447202	0	1447202	4.50%	0	1302482	1302482	90
1968	2800556	0	0	0	2800556	0	2800556	4.50%	0	2520500	2520500	90
1969	1810513	0	0	0	1810513	0	1810513	4.50%	0	1629462	1629462	90
1970	771699	0	0	0	771699	0	771699	4.50%	0	694529	694529	90
1971	987179	0	0	0	987179	0	987179	4.50%	0	888461	888461	90
1972	5525257	0	66299	0	5458958	0	5458958	4.50%	0	4913063	4913063	90
1973	954472	0	0	0	954472	0	954472	4.50%	0	859024	859024	90
1974	2449570	0	0	0	2449570	0	2449570	4.50%	0	2204613	2204613	90
1975	4836088	0	0	0	4836088	0	4836088	4.50%	0	4352479	4352479	90
1976	3341126	0	0	0	3341126	0	3341126	4.50%	0	3007014	3007014	90
1977	1161983	0	0	0	1161983	0	1161983	4.50%	0	1045785	1045785	90
1978	1167912	0	0	0	1167912	0	1167912	4.50%	0	1051121	1051121	90
1979	1100156	0	42366	0	1057789	0	1057789	4.50%	0	952011	952011	90
1980	295799	0	0	0	295799	0	295799	4.50%	0	266216	266216	90
1981	5306352	0	0	0	5306352	0	5306352	4.50%	0	4775717	4775717	90
1982	5368852	0	0	0	5368852	0	5368852	4.50%	0	4831966	4831966	90
1983	2994507	0	0	0	2994507	0	2994507	4.50%	0	2695057	2695057	90
1984	12601217	0	0	0	12601217	0	12601217	4.50%	0	11341096	11341096	90
1985	24498309	0	0	0	24498309	0	24498309	4.50%	0	22048478	22048478	90
1986	14049383	0	0	0	14049383	0	14049383	4.50%	0	12644445	12644445	90
1987	52050932	0	0	0	52050932	0	52050932	4.50%	0	46845839	46845839	90
1988	84562060	0	14684	0	84547377	0	84547377	4.50%	0	76092638	76092638	90
1989	78087644	0	318200	0	77769444	0	77769444	4.50%	0	69992499	69992499	90
1990	48528479	0	283272	0	48245206	0	48245206	4.50%	0	43420686	43420686	90
1991	104264404	0	107506	0	104156898	0	104156898	4.50%	0	93741209	93741209	90
1992	145704590	0	252600	0	145451990	0	145451990	4.50%	0	130906792	130906792	90
1993	176287439	0	0	0	176287439	0	176287439	4.50%	0	158658695	158658695	90
1994	186064570	0	838967	0	185225603	0	185225603	5.28%	0	166703042	166703042	90
1995	111773770	0	126143	0	111647626	0	111647626	5.28%	0	100482864	100482864	90
1996	95099988	0	72624	0	95027364	0	95027364	5.28%	0	85524628	85524628	90
1997	97643665	0	3101364	0	94542301	0	94542301	5.28%	0	85088071	85088071	90
1998	408481911	0	3255103	0	405226808	0	405226808	5.28%	0	364704126	364704126	90
1999	144725536	0	618151	0	144107385	0	144107385	5.28%	0	129696647	129696647	90
2000	51844556	0	105042	0	51739514	0	51739514	5.28%	0	46565562	46565562	90
2001	60602460	0	0	0	60602460	0	60602460	5.28%	0	54542214	54542214	90
2002	86942207	0	0	0	86942207	0	86942207	5.28%	0	78247986	78247986	90
2003	178936447	0	0	0	178936447	32700000	146236447	5.28%	0	131612802	131612802	90
2004	184994063	0	0	0	184994063	57000000	127994063	5.28%	3993415	111201242	115194657	90
2005	210478018	0	0	0	210478018	41363000	169115018	5.28%	8929273	140838987	149768260	89
2006	207161448	0	0	0	207161448	90000000	117161448	5.28%	6186124	93354242	99540366	85
2007	471718292	0	0	0	471718292	600000	471118292	5.28%	24875046	358426797	383301842	81
2008	381302545	0	0	0	381302545	16700000	364602545	5.28%	19251014	264263924	283514939	78
2009	218271780	0	0	0	218271780	2700000	215571780	5.28%	11382190	148485842	159868032	74
2010	328175487	0	0	0	328175487	0	328175487	5.28%	17327666	214232958	231560624	71
2011	227716134	0	0	0	227716134	0	227716134	5.28%	12023412	132257531	144280942	63
2012	136268674	0	0	0	136268674	0	136268674	5.28%	7194986	71949860	79144846	58
2013	168787484	0	0	0	168787484	0	168787484	5.28%	8911979	80207812	89119792	53
2014	228701478	0	0	0	228701478	0	228701478	5.28%	12075438	96603504	108678942	48
2015	189884676	0	0	0	189884676	0	189884676	5.28%	10025911	70181376	80207287	42
2016	231221455	0	0	0	231221455	0	231221455	5.28%	12208493	73250957	85459450	37
2017	173331522	0	0	0	173331522	0	173331522	5.28%	9151904	45759522	54911426	32
2018	224297319	0	0	0	224297319	0	224297319	5.28%	11842898	47371594	59214492	26
2019	323664652	0	0	-858082	322806571	70539232	252267339	5.28%	13319715	39959146	53278862	21
2020	189533998	0	0	0	189533998	0	189533998	5.28%	10007395	20014790	30022185	16
2021	189069147	0	0	0	189069147	0	189069147	5.28%	9977620	9982851	19960471	11
2022	268037100	1378910	0	0	269416010	0	269416010	5.28%	14225165	0	14225165	5
TOTAL :	6759862492	1378910	9202321	-858082	6751180999	311602232	6439578767		222909646	3967153338	4190062984	

DEPRECIATION FOR THE YEAR 2022-23 MERC ORDER : LIFE 17 YEARS PAST : 1947 LIFE : 35 YEARS

TRANSFORMER

FROM 2011-12 RATE OF DEP : 2.57 %

RATE OF DEP : 5.28 % FROM 1994-95 LIFE : 25 YEARS RATE OF DEP : 3.60%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	12	14	15	16	17	18	
					(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1948	118043	0	0	0	118043	0	118043	2.57%	0	106239	106239	90
1949	393459	0	0	0	393459	0	393459	2.57%	0	354113	354113	90
1950	35070	0	0	0	35070	0	35070	2.57%	0	31563	31563	90
1951	116886	0	0	0	116886	0	116886	2.57%	0	105197	105197	90
1952	77694	0	0	0	77694	0	77694	2.57%	0	69925	69925	90
1953	374990	0	0	0	374990	0	374990	2.57%	0	337491	337491	90
1954	22531	0	0	0	22531	0	22531	2.57%	0	20278	20278	90
1955	-2211537	0	0	0	-2211537	0	-2211537	2.57%	0	-1990383	-1990383	90
1956	0	0	0	0	0	0	0	2.57%	0	0	0	#DIV/0!
1957	364808	0	0	0	364808	0	364808	2.57%	0	328327	328327	90
1958	-756981	0	0	0	-756981	0	-756981	2.57%	0	-681283	-681283	90
1959	52171	0	0	0	52171	0	52171	2.57%	0	46954	46954	90
1960	1139739	0	0	0	1139739	0	1139739	2.57%	0	1025765	1025765	90
1961	-2599572	0	0	0	-2599572	0	-2599572	2.57%	0	-2339615	-2339615	90
1962	141426	0	0	0	141426	0	141426	2.57%	0	127283	127283	90
1963	160185	0	0	0	160185	0	160185	2.57%	0	144167	144167	90
1964	114126	0	0	0	114126	0	114126	2.57%	0	102713	102713	90
1965	-183484	0	0	0	-183484	0	-183484	2.57%	0	-165136	-165136	90
1966	309882	0	0	0	309882	0	309882	2.57%	0	278894	278894	90
1967	686285	0	21337	0	664948	0	664948	2.57%	0	598453	598453	90
1968	1325713	0	0	0	1325713	0	1325713	2.57%	0	1193142	1193142	90
1969	1380151	0	0	0	1380151	0	1380151	2.57%	0	1242136	1242136	90
1970	115387	0	0	0	115387	0	115387	2.57%	0	103848	103848	90
1971	670727	0	0	0	670727	0	670727	2.57%	0	603655	603655	90
1972	307610	0	19400	0	288210	0	288210	2.57%	0	259389	259389	90
1973	0	0	0	0	0	0	0	2.57%	0	0	0	0
1974	1369818	0	0	0	1369818	0	1369818	2.57%	0	1232836	1232836	90
1975	1344384	0	0	0	1344384	0	1344384	2.57%	0	1209946	1209946	90
1976	470	0	0	0	470	0	470	2.57%	0	423	423	90
1977	365036	0	0	0	365036	0	365036	2.57%	0	328533	328533	90
1978	1300129	0	0	0	1300129	0	1300129	2.57%	0	1170116	1170116	90
1979	250247	0	0	0	250247	0	250247	2.57%	0	225223	225223	90
1980	0	0	0	0	0	0	0	2.57%	0	0	0	#DIV/0!
1981	7871517	0	0	0	7871517	0	7871517	2.57%	0	7084365	7084365	90
1982	5664139	0	0	0	5664139	0	5664139	2.57%	0	5097728	5097728	90
1983	3278419	0	0	0	3278419	0	3278419	2.57%	0	2950577	2950577	90
1984	2233783	0	236553	0	1997230	0	1997230	2.57%	0	1797506	1797506	90
1985	3593436	0	0	0	3593436	0	3593436	5.28%	0	3234092	3234092	90
1986	7049192	0	0	0	7049192	0	7049192	5.28%	0	6344273	6344273	90
1987	3653031	0	0	0	3653031	0	3653031	5.28%	0	3287728	3287728	90
1988	336377	0	251000	0	85377	0	85377	5.28%	0	76839	76839	90
1989	18090741	0	0	0	18090741	0	18090741	5.28%	0	16281667	16281667	90
1990	23464558	0	0	0	23464558	0	23464558	5.28%	0	21118102	21118102	90
1991	10918268	0	0	0	10918268	0	10918268	5.28%	0	9826441	9826441	90
1992	61799498	0	0	0	61799498	0	61799498	5.28%	0	55619549	55619549	90
1993	63773953	0	0	0	63773953	0	63773953	5.28%	0	57396557	57396557	90
1994	40002278	0	0	0	40002278	0	40002278	5.28%	0	36002050	36002050	90
1995	32322691	0	596900	0	31725791	0	31725791	5.28%	0	28553212	28553212	90
1996	215354695	0	2510475	0	212844220	0	212844220	5.28%	0	191559798	191559798	90
1997	129366708	0	0	0	129366708	0	129366708	5.28%	0	116430037	116430037	90
1998	209522333	0	0	0	209522333	0	209522333	5.28%	0	188570100	188570100	90
1999	103861998	0	0	0	103861998	0	103861998	5.28%	0	93475798	93475798	90
2000	74459436	0	0	0	74459436	0	74459436	5.28%	0	67013492	67013492	90
2001	87284536	0	0	0	87284536	0	87284536	5.28%	0	78556083	78556083	90
2002	104943575	0	0	0	104943575	0	104943575	5.28%	0	94449218	94449218	90
2003	64501802	0	0	0	64501802	11800000	52701802	5.28%	0	47431622	47431622	90
2004	146735900	0	0	0	146735900	44800000	101935900	5.28%	3180400	88561910	91742310	90
2005	101747362	0	0	0	101747362	20681500	81065862	5.28%	4280278	67511650	71791927	89
2006	128614466	0	0	0	128614466	55000000	73614466	5.28%	3886844	58656007	62542850	85
2007	445257553	0	0	0	445257553	600000	444657553	5.28%	23477919	338295466	361773385	81
2008	246928535	0	0	0	246928535	10700000	236228535	5.28%	12472867	171218442	183691309	78
2009	178813794	0	0	0	178813794	2200000	176613794	5.28%	9325208	121651581	130976790	74
2010	255598811	0	0	0	255598811	0	255598811	5.28%	13495617	166854904	180350521	71
2011	111382068	0	0	0	111382068	0	111382068	5.28%	5880973	64690705	70571678	63
2012	166905888	0	0	0	166905888	0	166905888	5.28%	8812631	88126309	96938940	58
2013	139163531	0	0	0	139163531	0	139163531	5.28%	7347834	66130510	73478344	53
2014	256664275	0	0	0	256664275	0	256664275	5.28%	13551874	108414990	121966863	48
2015	220889720	0	0	0	220889720	0	220889720	5.28%	11662977	81640841	93303818	42
2016	107130646	0	0	0	107130646	0	107130646	5.28%	5656498	33938989	39595487	37
2017	126712854	0	0	0	126712854	0	126712854	5.28%	6690439	33452193	40142632	32
2018	253396310	0	0	0	253396310	53143197	200253113	5.28%	10573364	42293457	52866822	26
2019	429539880	0	0	0	429539880	155875654	273664226	5.28%	14449471	43348413	57797884	21
2020	171989719	0	0	0	171989719	0	171989719	5.28%	9081057	18162114	27243171	16
2021	144921189	0	0	0	144921189	0	144921189	5.28%	7651839	7651839	15303678	11
2022	188043510	1345287	0	0	189388797	0	189388797	5.28%	9999728	0	9999728	5
TOTAL :	5100568368	1345287	3635664	0	5098277991	354800351	4743477640		181477818	2738827348	2920305167	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 6 YEARS FROM 2011-12 RATE OF DEP : 15 %

LIFE : 12 YEARS RATE OF DEP :7.50%

SCADA

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISI ON FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	12	14	15	16	17	18	
					(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
2001	113465411	0	0	0	113465411	0	113465411	7.50%	0	102118870	102118870	90
2002	42372935	0	0	0	42372935	0	42372935	7.50%	0	38135642	38135642	90
2003	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2004	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2005	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2006	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2007	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2008	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2009	15597509	0	0	0	15597509	0	15597509	15%	0	14037758	14037758	90
2010	29964040	0	0	0	29964040	0	29964040	15%	0	26967636	26967636	90
2011	6575457	0	0	0	6575457	0	6575457	15%	0	5917911	5917911	90
2012	174384544	0	0	0	174384544	0	174384544	15%	0	156946090	156946090	90
2013	600000	0	0	0	600000	0	600000	15%	0	540000	540000	90
2014	25090125	0	0	0	25090125	0	25090125	15%	0	22581113	22581113	90
2015	8297243	0	0	0	8297243	0	8297243	15%	0	7467519	7467519	90
2016	21909143	0	0	0	21909143	0	21909143	15%	0	19718229	19718229	90
2017	19953228	0	0	0	19953228	0	19953228	15%	2992984	14964921	17957905	90
2018	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2019	-89586	0	0	555120	465534	0	465534	15%	69830	209490	279320	60
2020	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2021	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
2022	0	0	0	0	0	0	0	15%	0	0	0	#DIV/0!
TOTAL :	458120050	0	0	555120	458675170	0	458675170		3062814	409605179	412667993	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 17 YEARS LIFE : 10 YEARS

BATTERIES

FROM 2011-12 22-23 RATE OF DEP : 9 %

RATE OF DEP : 5.28 % 18% FROM 1994-95 LIFE : 5 YEARS RATE OF DEP : 18%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2022-23
1	7	8	9	10	11	12	14	15	16	17	18	
					(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
1989	2055	0	0	0	2055	0	2055	9%	0	1850	1850	90
1990	428864	0	0	0	428864	0	428864	9%	0	385978	385978	90
1991	0	0	0	0	0	0	0	9%	0	0	0	#DIV/0!
1992	395	0	0	0	395	0	395	9%	0	356	356	90
1993	106722	0	0	0	106722	0	106722	9%	0	96050	96050	90
1994	0	0	0	0	0	0	0	18%	0	0	0	#DIV/0!
1995	607422.25	0	0	0	607422	0	607422	18%	0	546680	546680	90
1996	44570	0	0	0	44570	0	44570	18%	0	40113	40113	90
1997	390674	0	0	0	390674	0	390674	18%	0	351607	351607	90
1998	371549	0	0	0	371549	0	371549	18%	0	334394	334394	90
1999	4921	0	0	0	4921	0	4921	18%	0	4429	4429	90
2000	1282890	0	0	0	1282890	0	1282890	18%	0	1154601	1154601	90
2001	6361665	0	0	0	6361665	0	6361665	18%	0	5725499	5725499	90
2002	360950	0	0	0	360950	0	360950	18%	0	324855	324855	90
2003	1847699.5	0	0	0	1847700	0	1847700	18%	0	1662930	1662930	90
2004	3159591	0	0	0	3159591	0	3159591	18%	0	2843632	2843632	90
2005	1881946.98	0	0	0	1881947	0	1881947	18%	0	1693752	1693752	90
2006	3859176	0	0	0	3859176	0	3859176	18%	0	3473258	3473258	90
2007	2728145	0	0	0	2728145	0	2728145	18%	0	2455331	2455331	90
2008	643820	0	0	0	643820	0	643820	18%	0	579438	579438	90
2009	401150	0	0	0	401150	0	401150	5.28%	0	361035	361035	90
2010	8941196	0	0	0	8941196	0	8941196	5.28%	0	8047076	8047076	90
2011	7142155	0	0	0	7142155	0	7142155	5.28%	377106	4148164	4525269	63
2012	8937826	0	0	0	8937826	0	8937826	5.28%	471917	4719172	5191089	58
2013	5932726	0	0	0	5932726	0	5932726	5.28%	313248	2819231	3132479	53
2014	15654021	0	0	0	15654021	0	15654021	5.28%	826532	6612258	7438791	48
2015	11613220	0	0	0	11613220	0	11613220	5.28%	613178	4292246	4905424	42
2016	3822093	0	0	0	3822093	0	3822093	5.28%	201807	1210839	1412646	37
2017	6303908	0	0	0	6303908	0	6303908	5.28%	332846	1664232	1997078	32
2018	1442032	0	0	0	1442032	0	1442032	5.28%	76139	304557	380697	26
2019	14400851	0	0	0	14400851	150851	14250000	5.28%	752400	2257200	3009600	21
2020	9009137	0	0	0	9009137	0	9009137	5.28%	475682	951365	1427047	16
2021	13299583	0	0	0	13299583	0	13299583	18.00%	2393925	2393925	4787850	36
2022	5984176	25226	0	0	6009402	0	6009402	18.00%	1081692	0	1081692	18
TOTAL :	136967130	25226	0	0	136992356	150851	136841504.9		7916473	#######	#######	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 17 YEARS

FROM 2011-12

RATE OF DEP : 5.28 %

LIFE : 10 YEARS

RATE OF DEP :9 %

CAPACITORS

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISI ON FOR YEAR 2023-24	CUMM.D EP. PROVIDE D UPTO 2022-23	CUMM. DEP. PROVIDE D UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	12	14	15	16	17	18	
					(7-8-9-/+10)		(11-12-13)		(14*15)		(16+17)	
2001	0	0	0	0	0	0	0	9%	0	0	0	0
2002	3245920	0	3880	0	3242040	0	3242040	9%	0	2917836	2917836	90
2003	4721610.8	0	22700	0	4698911	0	4698911	9%	0	4229020	4229020	90
2004	14502387	0	0	0	14502387	0	14502387	9%	0	#######	#######	90
2005	647939	0	0	0	647939	0	647939	5.28%	0	583145	583145	90
2006	11319	0	0	0	11319	0	11319	5.28%	0	10187	10187	90
2007	19009834	0	0	0	19009834	0	19009834	5.28%	0	#######	#######	90
2008	3976507	0	0	0	3976507	0	3976507	5.28%	0	3578856	3578856	90
2009	3156963	0	0	0	3156963	0	3156963	5.28%	155323	2685944	2841267	90
2010	16089136	0	0	0	16089136	0	16089136	5.28%	849506	#######	#######	81
2011	16316545	0	0	0	16316545	0	16316545	5.28%	861514	9476649	#######	63
2012	6136188	0	0	0	6136188	0	6136188	5.28%	323991	3239907	3563898	58
2013	6053230	0	0	0	6053230	0	6053230	5.28%	319611	2876495	3196105	53
2014	10728845	0	0	0	10728845	0	10728845	5.28%	566483	4531864	5098347	48
2015	10432479	0	0	0	10432479	0	10432479	5.28%	550835	3855844	4406679	42
2016	17820039	0	0	0	17820039	0	17820039	5.28%	940898	5645388	6586286	37
2017	8604750	0	0	0	8604750	0	8604750	5.28%	454331	2271654	2725985	32
2018	3741572	0	0	0	3741572	0	3741572	5.28%	197555	790220	987775	26
2019	10875101	0	0	0	10875101	3615733	7259368	5.28%	383295	1149884	1533179	21
2020	3326469	0	0	0	3326469	0	3326469	5.28%	175638	351275	526913	16
2021	7603124	0	0	0	7603124	0	7603124	5.28%	401445	401445	802890	11
2022	159168	0	0	0	159168	0	159168	5.28%	8404	0	8404	5
TOTAL :	167159126	0	26580	0	167132546	3615733	163516813		6188827	#######	#######	

DEPRECIATION FOR THE YEAR 2023-24

MERC ORDER : LIFE 17 YEARS FROM 2011-12 RATE OF DEP : 5.28 %

LIFE : 7 YEARS RATE OF DEP : 12.86 %

D.E.A. ON HIRE

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM. DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1986	77814	0	0	0	77814	77814	12.86%	0	70033	70033	90
1987	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
1988	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
1989	176571	0	0	0	176571	176571	12.86%	0	158914	158914	90
1990	66151	0	0	0	66151	66151	12.86%	0	59536	59536	90
1991	1628	0	0	0	1628	1628	12.86%	0	1465	1465	90
1992	-814	0	0	0	-814	-814	12.86%	0	-733	-733	90
1993	1154	0	0	0	1154	1154	12.86%	0	1039	1039	90
1994	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
1995	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
1996	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
1997	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
1998	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
1999	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2000	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2001	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2002	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2003	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2004	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2005	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2006	97425	0	0	0	97425	97425	12.86%	0	87683	87683	90
2007	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2008	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2009	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2010	0	0	0	0	0	0	12.86%	0	0	0	#DIV/0!
2011	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2022	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	419929	0	0	0	419929	419929		0	377936	377936	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 17 YEARS LIFE : 1 YEARS

LOOSE TOOLS

FROM : 2011-12 RATE OF DEP : 90 %

RATE OF DEP.: 5.28%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM.DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1980	207131	0	0	0	207131	207131	90%	0	186418	186418	90
1981	0	0	0	0	0	0	90%	0	0	0	#DIV/0!
1982	5080	0	0	0	5080	5080	90%	0	4572	4572	90
1983	1069016	0	0	0	1069016	1069016	90%	0	962114	962114	90
1984	-1077774	0	0	0	-1077774	-1E+06	90%	0	-969997	-969997	90
1985	57103	0	0	0	57103	57103	90%	0	51393	51393	90
1986	16290	0	0	0	16290	16290	90%	0	14661	14661	90
1987	54640	0	0	0	54640	54640	90%	0	49176	49176	90
1988	95093	0	0	0	95093	95093	90%	0	85584	85584	90
1989	40883	0	0	0	40883	40883	90%	0	36795	36795	90
1990	94539	0	17820	0	76719	76719	90%	0	69047	69047	90
1991	4343601	0	0	0	4343601	4343601	90%	0	3909241	3909241	90
1992	30747	0	0	0	30747	30747	90%	0	27672	27672	90
1993	-5101356	0	0	0	-5101356	-5E+06	90%	0	-4591220	#######	90
1994	35034	0	0	0	35034	35034	90%	0	31531	31531	90
1995	-68947	0	0	0	-68947	-68947	90%	0	-62052	-62052	90
1996	120515	0	0	0	120515	120515	90%	0	108464	108464	90
1997	82983	0	0	0	82983	82983	90%	0	74685	74685	90
1998	-72471	0	0	0	-72471	-72471	90%	0	-65224	-65224	90
1999	303622	0	0	0	303622	303622	90%	0	273260	273260	90
2000	206852	0	0	0	206852	206852	90%	0	186167	186167	90
2001	51500	0	0	0	51500	51500	90%	0	46350	46350	90
2002	393168	0	0	0	393168	393168	90%	0	353851	353851	90
2003	84857	0	0	0	84857	84857	90%	0	76371	76371	90
2004	7218	0	0	0	7218	7218	90%	0	6496	6496	90
2005	0	0	0	0	0	0	90%	0	0	0	#DIV/0!
2006	0	0	0	0	0	0	90%	0	0	0	#DIV/0!
2007	0	0	0	0	0	0	90%	0	0	0	#DIV/0!
2008	0	0	0	0	0	0	90%	0	0	0	#DIV/0!
2009	0	0	0	0	0	0	90%	0	0	0	#DIV/0!
2010	0	0	0	0	0	0	90%	0	0	0	#DIV/0!
2011	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2012	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2013	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2014	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2015	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2016	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2017	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2018	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2019	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2020	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2021	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
2022	0	0	0	0	0	0	5.28%	0	0	0	#DIV/0!
TOTAL :	979324	0	17820	0	961504	961504		0	865354	865354	

DEPRECIATION FOR THE YEAR 2023-24 MERC ORDER : LIFE 14 YEARS LIFE : 10 YEARS

OFFICE EQUIPMENTS

FROM 2011-12 RATE OF DEP : 9 %

RATE OF DEP : 6.33 % FROM 1994-95 LIFE : 18 YEARS RATE OF DEP : 5%

YEAR	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2023-24	ASSET TRANSFER	BALANCE VALUE OF ASSETS	NET ASSETS VALUE AS ON 31.03.23	RATE OF DEP.	DEP. PROVISION FOR YEAR 2023-24	CUMM. DEP. PROVIDED UPTO 2022-23	CUMM. DEP. PROVIDED UPTO 2023-24	TOTAL % OF DEP PROVIDED UP TO 2023-24
1	7	8	9	10	11	14	15	16	17	18	
					(7-8-9-/+10)	(11-12-13)		(14*15)		(16+17)	
1981	0	0	0	0	0	0	9%	0	0	0	#DIV/0!
1982	109008	0	0	0	109008	109008	9%	0	98107	98107	90
1983	39013	0	0	0	39013	39013	9%	0	35112	35112	90
1984	32576	0	0	0	32576	32576	9%	0	29318	29318	90
1985	204157	0	0	0	204157	204157	9%	0	183741	183741	90
1986	33187	0	0	0	33187	33187	9%	0	29868	29868	90
1987	191169	0	0	0	191169	191169	9%	0	172052	172052	90
1988	949	0	0	0	949	949	9%	0	854	854	90
1989	0	0	0	0	0	0	9%	0	0	0	#DIV/0!
1990	0	0	0	0	0	0	9%	0	0	0	#DIV/0!
1991	110075	0	0	0	110075	110075	9%	0	99068	99068	90
1992	347849	0	0	0	347849	347849	9%	0	313064	313064	90
1993	0	0	0	0	0	0	5%	0	0	0	#DIV/0!
1994	0	0	0	0	0	0	5%	0	0	0	#DIV/0!
1995	0	0	0	0	0	0	5%	0	0	0	#DIV/0!
1996	0	0	0	0	0	0	5%	0	0	0	#DIV/0!
1997	2352	0	0	0	2352	2352	5%	0	2117	2117	90
1998	122352	0	0	0	122352	122352	6.33%	0	110117	110117	90
1999	674564	0	0	0	674564	674564	6.33%	0	607107	607107	90
2000	23096	0	0	0	23096	23096	6.33%	0	20787	20787	90
2001	0	0	0	0	0	0	6.33%	0	0	0	#DIV/0!
2002	2717	0	0	0	2717	2717	6.33%	0	2445	2445	90
2003	3397819	0	0	0	3397819	3397819	6.33%	0	3058037	3058037	90
2004	2544858	0	0	0	2544858	2544858	6.33%	0	2290373	2290373	90
2005	2920371	0	0	0	2920371	2920371	6.33%	0	2628334	2628334	90
2006	410000	0	0	0	410000	410000	6.33%	0	369000	369000	90
2007	27800	0	0	0	27800	27800	6.33%	0	25020	25020	90
2008	0	0	0	0	0	0	6.33%	0	0	0	#DIV/0!
2009	1335726	0	20450	0	1315276	1315276	6.33%	70631	1113118	1183749	90
2010	3156042	0	0	0	3156042	3156042	6.33%	199777	2513156	2712934	86
2011	489066	0	25758	0	463308	463308	6.33%	29327	322602	351929	76
2012	548165	0	0	0	548165	548165	6.33%	34699	346988	381687	70
2013	6550985	0	0	0	6550985	6550985	6.33%	414677	3732096	4146774	63
2014	268993	0	0	0	268993	268993	6.33%	17027	136218	153245	57
2015	181304	0	0	0	181304	181304	6.33%	11477	80336	91812	51
2016	3034985	0	0	0	3034985	3034985	6.33%	192115	1152687	1344802	44
2017	0	0	0	0	0	0	6.33%	0	0	0	#DIV/0!
2018	109540	0	0	0	109540	109540	6.33%	6934	27736	34669	32
2019	0	0	0	0	0	0	6.33%	0	0	0	#DIV/0!
2020	0	0	0	0	0	0	6.33%	0	0	0	#DIV/0!
2021	34482	0	0	0	34482	34482	6.33%	2183	2183	4365	13
2022	247466	0	0	0	247466	247466	6.33%	15665	0	15665	6
TOTAL :	27150666	0	46208	0	27104458	27104458		994512	#######	#######	

SUMMARY OF PROVISION OF DEPRECIATION ON ASSETS OF SUPPLY DIVISION
FOR THE YEAR 2023-24

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	ASSET TRANSFER	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.23	DEP. PROVISION FOR YEAR 2023-24
1	7		8	9	10	11	12	13	15
					(7-8-/+9)			(10-11-12)	(13*14)
LAND	22953418	0	0	0	22953418	0	0	22953418	0
BUILDING	883842833	0	0	-6237000	877605833	0	0	877605833	28107199
BLDG CASH COLLN PORT CWK	149466	0	0	0	149466	0	0	149466	4229
MOTOR VEHICLE	138266695	0	15989559	0	122277136	0	0	122277136	2337929
MACHINE TOOLS	402530882	0	458290	1490942	403563535	0	0	403563535	18138231
FURNITURE	27906103	0	0	0	27906103	0	0	27906103	417763
ROOM A.C.	27063917	0	455830	0	26608088	0	0	26608088	1190473
PERSONAL COMPUTER	198843842	0	4968283	0	193875559	0	0	193875559	7584247
ELECTRONIC EQUIP	5380858	0	0	0	5380858	0	0	5380858	163162
ELECTRONIC EQUIP SEPRATED M.T.	27419074	0	0	858082	28277156	0	0	28277156	1685524
CYCLOSTYLE MACH	1428550	0	0	0	1428550	0	0	1428550	0
CABLE & MAINS	12758450000	1650577	9262163	-446475	12750391938	384979655	1577310527	10788101756	456826552
DIST PILLARS	436214362	0	0	0	436214362	8101520	0	428112842	15319073
ST LTG LAMPS	1681633737	0	0	0	1681633737	259545591	0	1422088146	54657815
METERS (CONVENTIONAL)	355159356	0	20811105	0	334348251	50225000	0	284123251	1175461
METERS (ELECTRONICS)	1320303840	0	74802679	0	1245501161	148887387	0	1096613774	75863276
BUSINESS PROC AUTOMATION	500624525	0	0	0	500624525	0	0	500624525	1766544
SWITCHGEARS	6759862492	1378910	9202321	-858082	6751180999	311602232	0	6439578767	222909646
TRANSFORMER	5100568368	1345287	3635664	0	5098277991	354800351	0	4743477640	181477818
SCADA	458120050	0	0	555120	458675170	0	0	458675170	3062814
BATTERIES	136967130	25226	0	0	136992356	150851	0	136841505	7916473
CAPACITORS	167159126	0	26580	0	167132546	3615733	0	163516813	6188827
DEA ON HIRE	419929	0	0	0	419929	0	0	419929	0
LOOSE TOOLS	979324	0	17820	0	961504	0	0	961504	0
OFFICE EQUIPMENTS	27150666	0	46208	0	27104458	0	0	27104458	994512
TOTAL :	31439398543	4400000	139676503	-4637413	31299484628	1521908320	1577310527	28200265780	1087787569

DETAILS OF E-6 WISE ASSETS GROUPING - SUPPLY DIVISION

DEPRECITION PROVISION FOR THE YEAR 2023-24

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2022	IDC	WRITE OFF DURING THE YEAR 2022-23	BALANCE VALUE OF ASSETS	GOVT. GRANT	CABEL CAPITAL CONN. FEES	NET ASSETS VALUE AS ON 31.03.23	DEP. PROVISION FOR YEAR 2023-24
LAND	**22953418**	**0**	**0**	**22953418**	**0**	**0**	**22953418**	**0**
BUILDING	883842833	0	0	877605833	0	0	877605833	28107199
BLDG CASH COLL CHOK	149466	0	0	149466	0	0	149466	4229
BUILDINGS	**883992299**	**0**	**0**	**877755299**	**0**	**0**	**877755299**	**28111428**
BUSINESS PROCESSH AUTOMATION	500624525	0	0	500624525	0	0	500624525	1766544
SWITCHGEARS	6759862492	1378910	9202321	6751180999	311602232	0	6439578767	222909646
TRANSFORMER	5100568368	1345287	3635664	5098277991	354800351	0	4743477640	181477818
SCADA	458120050	0	0	458675170	0	0	458675170	3062814
BATTERIES	136967130	25226	0	136992356	150851	0	136841505	7916473
CAPACITORS	167159126	0	26580	167132546	3615733	0	163516813	6188827
PLANT & MACHINERY	**13123301691**	**2749423**	**12864566**	**13112883587**	**670169167**	**0**	**12442714420**	**423322123**
CABLE & MAINS	12758450000	1650577	9262163	12750391938	384979655	1577310527	10788101756	456826552
DIST PILLARS	436214362	0	0	436214362	8101520	0	428112842	15319073
CABLE & MAINS	**13194664361**	**1650577**	**9262163**	**13186606300**	**393081175**	**1577310527**	**11216214598**	**472145624**
METERS (CONVENTIONAL)	355159356	0	20811105	334348251	50225000	0	284123251	1175461
METERS (ELECTRONICS)	1320303840	0	74802679	1245501161	148887387	0	1096613774	75863276
METERS AND INSTALLATIONS	**1675463196**	**0**	**95613784**	**1579849412**	**199112387**	**0**	**1380737025**	**77038737**
STREET LIGHTING LAMPS	**1681633737**	**0**	**0**	**1681633737**	**259545591**	**0**	**1422088146**	**54657815**
D.E.A. ON HIRE	**419929**	**0**	**0**	**419929**	**0**	**0**	**419929**	**0**
MOTOR VEHICLES	**138266695**	**0**	**15989559**	**122277136**	**0**	**0**	**122277136**	**2337929**
MACHINE TOOLS	402530882	0	458290	403563535	0	0	403563535	18138231
ELECTRONIC EQUIP SEPRATED M.T.	27419074	0	0	28277156	0	0	28277156	1685524
LOOSE TOOLS	979324	0	17820	961504	0	0	961504	0
TOOLS AND EQUIPMENTS	**430929280**	**0**	**476110**	**432802195**	**0**	**0**	**432802195**	**19823755**
FURNITURE	27906103	0	0	27906103	0	0	27906103	417763
ROOM A.C.	27063917	0	455830	26608088	0	0	26608088	1190473
PERSONAL COMPUTER	198843842	0	4968283	193875559	0	0	193875559	7584247
ELECTRONIC EQUIP	5380858	0	0	5380858	0	0	5380858	163162
CYCLOSTYLE MACH	1428550	0	0	1428550	0	0	1428550	0
OFFICE EQUIPMENTS	27150666	0	46208	27104458	0	0	27104458	994512
FURNITURE AND OFFICE EQUIPMENTS	**287773936**	**0**	**5470321**	**282303616**	**0**	**0**	**282303616**	**10350157**
TOTAL :	**31439398543**	**4400000**	**139676503**	**31299484628**	**1521908320**	**1577310527**	**28200265780**	**1087787569**

SUMMARY OF DEPRECIATION CHARGED ON ASSETS OF SUPPLY DIVISION
DURING FINANCIAL YEAR 2023-24

ASSETS DESCREPTION	BOOK VALUE AS ON 01.04.2022	BALANCE VALUE OF ASSETS (after w/off & other adjustments)	NET ASSETS VALUE AS ON 31.03.23 (after GOVT. grant & Capital conn fees	DEP. CHARGED FOR YEAR 2023-24
1	7	10	13	15
		(7-8-/+9)	(10-11-12)	(13*14)
LAND	22953418	22953418	22953418	0
BUILDING	883842833	877605833	877605833	28107199
BLDG CASH COLLN PORT CWK	149466	149466	149466	4229
MOTOR VEHICLE	138266695	122277136	122277136	2337929
MACHINE TOOLS	402530882	403563535	403563535	18138231
FURNITURE	27906103	27906103	27906103	417763
ROOM A.C.	27063917	26608088	26608088	1190473
PERSONAL COMPUTER	198843842	193875559	193875559	7584247
ELECTRONIC EQUIP	5380858	5380858	5380858	163162
ELECTRONIC EQUIP SEPRATED M.T.	27419074	28277156	28277156	1685524
CYCLOSTYLE MACH	1428550	1428550	1428550	0
CABLE & MAINS	12758450000	12750391938	10788101756	456826552
DIST PILLARS	436214362	436214362	428112842	15319073
ST LTG LAMPS	1681633737	1681633737	1422088146	54657815
METERS (CONVENTIONAL)	355159356	334348251	284123251	1175461
METERS (ELECTRONICS)	1320303840	1245501161	1096613774	75863276
BUSINESS PROC AUTOMATION	500624525	500624525	500624525	1766544
SWITCHGEARS	6759862492	6751180999	6439578767	222909646
TRANSFORMER	5100568368	5098277991	4743477640	181477818
SCADA	458120050	458675170	458675170	3062814
BATTERIES	136967130	136992356	136841505	7916473
CAPACITORS	167159126	167132546	163516813	6188827
DEA ON HIRE	419929	419929	419929	0
LOOSE TOOLS	979324	961504	961504	0
OFFICE EQUIPMENTS	27150666	27104458	27104458	994512
TOTAL : OF SUPPLY DIVISION	31439398543	31299484628	28200265780	1087787569
ADD : SHARE OF GEN. ADM.@50% (85291643.00)				42645821.5
TOTAL :				1130433390

Received Government Grant distributed proportionatly in the year 2020-2021

IPDS Grant Received Rs.568813229/- Less 189900000/- consider in 2019-20
balance Grant Rs.378913229/- Distributed Proportionatly to Concern Assets.

				378913229.00
ASSETS		IPDS EXP		PROPORTIONATE
METERS ELECTONIC		62540000.00	62540000.00	32826592.05
CABLE	2910	99280978.73		
	2911	35632921.60		
	2913	207885.42		
	2935	45350423.75		
	2924	37597726.00	218069935.50	114462628.9
TRANSFORMER	2903	252798326.45		
	2930	43129381.34	295927707.79	155329359.4
SWITCHGEAR	2901	32449908.60		
	2902	17250068.76		
	2904	57611303.99		
	2905	9223426.77		
	2908	2775112.00		
	2914	293321.79		
	2915	12007614.00		
	2921	0.00		
	2931	2306971.00	133917726.91	70292014.54
CAPACITOR	2906	6864418.00	6864418.00	3603061.23
BATTERIES	2907	2816388.00	2816388.00	1478292.61
PILARS	2932	1647575.81		
	2937	107612.95	1755188.76	921280.227
			721891364.96	378913229.00

इंडियन बैंक
Indian Bank

Mumbai Fort Branch, Treasury Department,
Ground Floor, United Indian Building
Sir P.M. Road
Fort, MUMBAI 400 001

TEL: 022-22658977
FAX: 022-22658975

Date :30/09/2024

To
THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
BEST BHAVAND BEST MARG

Dear Sir,

Sub: Government Securities held on your behalf in our Constituent Account.

This is to certify that, we are holding in our SGL Constituents A/c with RBI-PDO, Mumbai, the following securities as on 30/09/2024 on account of THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING

Name of the CSGL account holder : Indian Bank

CSGL Account No. SG20077

GOI SECURITIES

ISIN NO	SECURITY	AMOUNT	LAST IP DT	NEXT IP DT
IN0020120062	8.30% GOI 31-12-2042	1000000	30/06/2024	30/12/2024
	GOVT. SECURITIES TOTAL :	1000000		

STATE GOVT. SECURITIES

ISIN NO	SECURITY	AMOUNT	LAST IP DT	NEXT IP DT
IN1620150186	8.21% HARYANA SDL UDAY 31/03/2026	50000000	30/03/2024	30/09/2024
IN2920160123	8.19% RAJASTHAN SDL UDAY 23/06/2026	5000000	23/06/2024	23/12/2024
IN3420170109	7.73% WEST BENGAL SDL 08/11/2032	60000000	08/05/2024	08/11/2024
IN1220180245	8.45% ASSAM SDL 06/03/2029	46000000	06/09/2024	06/03/2025
IN2920180196	8.84% RAJASTHAN SDL 12/09/2028	10000000	12/09/2024	12/03/2025
IN1620160045	8.18% HARYANA SDL UDAY 15/06/2025	26000000	15/06/2024	15/12/2024
IN1620170127	8.20% HARYANA SDL 07/02/2028	36000000	07/08/2024	07/02/2025
IN2920130183	10.03% RAJASTHAN SDL SPECIAL 18/10/2028	45000000	18/04/2024	18/10/2024
IN2220210248	6.91% MAHARASHTRA SDL 2033	12000000	15/09/2024	15/03/2025
IN2020210174	7.14 KERALA SDL 2035	71200000	29/06/2024	29/12/2024
IN2920220042	7.83% RAJASTHAN SDL 2032	50000000	22/06/2024	22/12/2024
IN3120220170	7.79% TAMIL NADU SGS 04/10/2032	74000000	20/04/2024	20/10/2024
IN1720220111	7.87% HIMACHAL PRADESH SGS 2035	50000000	30/05/2024	30/11/2024
IN3420220300	7.89% WEST BENGAL SGS 29/03/2040	50000000	29/03/2024	29/09/2024
IN3420220318	7.85% WEST BENGAL SGS 29/03/2042	28000000	29/03/2024	29/09/2024
	STATE GOVT. SECURITIES TOTAL :	611200000		

Grand Total For The Constituent Held Securities : 612200000

For INDIAN BANK

Branch Manager/CHIEF MANAGER

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING

Tel No: 022-22841134 (D)
: 022-227799613

BEST BHAVAN
BEST MARG,
POST BOX NO.192,
COLABA,
MUMBAI 400 001

Res.: AM(CASH)/ECRF21/ 3076 /2022

Date : 27.06.2022

Indian Bank,
Treassury Dept.,
MUMBAI

PHONE NO. 022 2266 4924

Kind Attention: Ms. Pallavi Madam

Dear Sir,

We have undertaken a transaction which needs to be settled through the SGL account which we hold with You. The details of the same are as under:-

SR.	PARTICULAR	DETAILS
1	DEAL TYPE	Our Purchase
2	COUNTER PARTY	SBI DFHI LTD.
3	COUNTER PARTY SGL A/C WITH	Reserve Bank of India
4	ISIN NUMBER	IN2920220042
5	SECURITY NAME	07.83% RJ SDL 2032
6	INTEREST PAYMENT DATE	Semi Annually, 22/12, 22/06
7	REDEMPTION DATE	22/06/2032 – 100%
8	LAST INTEREST PAYMENT DATE	26/06/2022
9	QUANTUM (Rs.)	5,00,00,000.00 (Rs. Five Crore Only)
10	PRICE (Rs.)	100.24
11	YIELD	Annualise 7.9465%, Semi 7.7946%
12	DEAL DATE	27.06.2022 at DEAL TIME : 13.00 P.M.
13	VALUE DATE	28.06.2022
14	PRINCIPAL AMOUNT (Rs.)	5,01,20,000.00
15	NO. OF DAYS	6 days(Last IP Dt: 22/06/2022)
16	ACCRUED/EX-INTEREST (Rs.)	65,250.00
17	SETTLEMENT AMOUNT (Rs.)	5,01,85,250.00 (Rs. Five Crore One Lac Eighty Five Thousand Two Hundred Fifty Only)
18	OUR SGL A/C NO.	03
19	SGL BANK A/C NO.	415 241 492
20	SETTLEMENT MODE	NDS
21	PAN NO.	AAALM0042L
22	LEI No.	335800JHQJCQVE6DZN65

You are Authorized to settle the Transaction and Debit our Saving A/C No. 415 241 492 and also credit the above said Security to our SGL A/C No. 03.

Yours faithfully,

AUTHORISED SIGNATORY
B.E.S.& T. UNDERTAKING

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING

Tel No: 022-22841134 (D)
: 022-227799613

BEST BHAVAN
BEST MARG,
POST BOX NO.192,
COLABA,
MUMBAI 400 001

Res.: AM(CASH)/ECRF25/ ----- /2023

Date : 05.07.2023

Indian Bank,
Treassury Dept.,
MUMBAI

PHONE NO. 022 2266 4924

Kind Attention:Ms. Pallavi Madam

Dear Sir,

We have undertaken a transaction which needs to be settled through the SGL account which we hold with You. The details of the same are as under:-

SR.	PARTICULAR	DETAILS
1	DEAL TYPE	Our Purchase
2	COUNTER PARTY	Taurrus Finsec Pvt. Ltd.
3	COUNTER PARTY SGL A/C WITH	The Federal Bank of India
4	ISIN NUMBER	IN3420220300
5	SECURITY NAME	07.89% West Bengal SDL 2040
6	INTEREST PAYMENT DATE	Semi Annually, 29/03, 29/09
7	REDEMPTION DATE	29/03/2040 – 100%
8	LAST INTEREST PAYMENT DATE	29/03/2023
9	QUANTUM (Rs.)	5,00,00,000.00 (Rs.Five Crore Only)
10	PRICE (Rs.)	103.6070
11	YIELD	Annualise 7.6500%,
12	DEAL DATE	05.07.2023 at DEAL TIME : 14.00 P.M.
13	VALUE DATE	06.07.2023
14	PRINCIPAL AMOUNT (Rs.)	5,18,03,500.00
15	NO. OF DAYS	97 days(Last IP Dt: 29/03/2023)
16	ACCRUED/EX-INTEREST (Rs.)	10,62,958.33
17	SETTLEMENT AMOUNT (Rs.)	5,28,66,458.33 (Rs. Five Crore Twenty Eight Lac Sixty Six Thousand Four Hundred Fifty Eight And Paise Thirty Three Only)
18	OUR SGL A/C NO.	03
19	SGL BANK A/C NO.	415 241 492
20	SETTLEMENT MODE	NDS
21	PAN NO.	AAALM0042L
22	LEI No.	335800JHQJCQVE6DZN65

You are Authorized to settle the Transaction and Debit our Saving A/C No. 415 241 492 and also credit the above said Security to our SGL A/C No. 03.

Yours faithfully,

AUTHORISED SIGNATORY
B.E.S.& T. UNDERTAKING

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING

Tel No: 022-22841134 (D)
: 022-227799613

BEST BHAVAN
BEST MARG,
POST BOX NO.192,
COLABA,
MUMBAI 400 001

Res.: AM(CASH)/ECRF22/ /2022

Date : 19.10.2022

Indian Bank,
Treassury Dept.,
MUMBAI

PHONE NO. 022 2266 4924

Dear Sir,

Kind Attention: Ms. Pallavi Madam

We have undertaken a transaction which needs to be settled through the SGL account which we hold with You. The details of the same are as under:-

SR.	PARTICULAR	DETAILS
1	DEAL TYPE	Our Purchase
2	COUNTER PARTY	SBI DFHI LTD.
3	COUNTER PARTY SGL A/C WITH	Reserve Bank of India
4	ISIN NUMBER	IN3120220170
5	SECURITY NAME	07.79% TN SGS 2032
6	INTEREST PAYMENT DATE	Semi Annually, 04/10, 04/04
7	REDEMPTION DATE	04/10/2032 – 100%
8	LAST INTEREST PAYMENT DATE	04/10/2022
9	QUANTUM (Rs.)	7,40,00,000.00 (Rs. Seven Crore Forty Lac Only)
10	PRICE (Rs.)	100.5325
11	YIELD	Annualise 7.8602%, Semi 7.7115%
12	DEAL DATE	19.10.2022 at DEAL TIME : 12.00 P.M.
13	VALUE DATE	20.10.2022
14	PRINCIPAL AMOUNT (Rs.)	7,43,94,050.00
15	NO. OF DAYS	16 days(Last IP Dt: 04/10/2022)
16	ACCRUED/EX-INTEREST (Rs.)	2,56,204.44
17	SETTLEMENT AMOUNT (Rs.)	7,46,50,254.44 (Rs. Seven Crore Forty Six Lac Fifty Thousand Two Hundred Fifty Four and Paise Forty Four Only)
18	OUR SGL A/C NO.	03
19	SGL BANK A/C NO.	415 241 492
20	SETTLEMENT MODE	NDS
21	PAN NO.	AAALM0042L
22	LEI No.	335800JHQJCQVE6DZN65

You are Authorized to settle the Transaction and Debit our Saving A/C No. 415 241 492 and also credit the above said Security to our SGL A/C No. 03.

Yours faithfully,

AUTHORISED SIGNATORY
B.E.S.& T. UNDERTAKING

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING

Tel No: 022-22841134 (D)
: 022-227799613

BEST BHAVAN
BEST MARG,
POST BOX NO.192,
COLABA,
MUMBAI 400 001

Res.: AM(CASH)/ECRF23/ --- /2022 Date : 29.11.2022

Indian Bank,
Treassury Dept.,
MUMBAI

PHONE NO. 022 2266 4924

Kind Attention: Ms. Pallavi Madam

Dear Sir,

We have undertaken a transaction which needs to be settled through the SGL account which we hold with You. The details of the same are as under:-

SR.	PARTICULAR	DETAILS
1	DEAL TYPE	Our Purchase
2	COUNTER PARTY	STCI Primary Dealer Ltd.
3	COUNTER PARTY SGL A/C WITH	Reserve Bank of India
4	ISIN NUMBER	IN1720220111
5	SECURITY NAME	07.87% HP SDL 2035
6	INTEREST PAYMENT DATE	Semi Annually, 09/11, 09/05
7	REDEMPTION DATE	09/11/2035 – 100%
8	LAST INTEREST PAYMENT DATE	09/11/2022
9	QUANTUM (Rs.)	5,00,00,000.00 (Rs. Five Crore Only)
10	PRICE (Rs.)	101.9000
11	YIELD	Annualise 7.7811%, Semi 7.6354%
12	DEAL DATE	29.11.2022 at DEAL TIME : 2.30 P.M.
13	VALUE DATE	30.11.2022
14	PRINCIPAL AMOUNT (Rs.)	5,09,50,000.00
15	NO. OF DAYS	21 days(Last IP Dt: 09/11/2022)
16	ACCRUED/EX-INTEREST (Rs.)	2,29,541.67
17	SETTLEMENT AMOUNT (Rs.)	5,11,79,541.67 (Rs. Five Crore Eleven Lac Seventy Nine Thousand Five Hundred Forty One and Sixty Seven Only)
18	OUR SGL A/C NO.	03
19	SGL BANK A/C NO.	415 241 492
20	SETTLEMENT MODE	NDS
21	PAN NO.	AAALM0042L
22	LEI No.	335800JHQJCQVE6DZN65

You are Authorized to settle the Transaction and Debit our Saving A/C No. 415 241 492 and also credit the above said Security to our SGL A/C No. 03.

Yours faithfully,

2)

AUTHORISED SIGNATORY
B.E.S.& T. UNDERTAKING

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING

Tel No: 022-22841134 (D)
: 022-227799613

BEST BHAVAN
BEST MARG,
POST BOX NO.192,
COLABA,
MUMBAI 400 001

Date : 05.07.2023

Res.: AM(CASH)/ECRF24/ ----- /2023

Indian Bank,
Treassury Dept.,
MUMBAI

PHONE NO. 022 2266 4924

Kind Attention:Ms. Pallavi Madam

Dear Sir,

We have undertaken a transaction which needs to be settled through the SGL account which we hold with You. The details of the same are as under:-

SR.	PARTICULAR	DETAILS
1	DEAL TYPE	Our Purchase
2	COUNTER PARTY	SBI DFHI LTD.
3	COUNTER PARTY SGL A/C WITH	Reserve Bank of India
4	ISIN NUMBER	IN3420220318
5	SECURITY NAME	07.85% West Bengal SDL 2042
6	INTEREST PAYMENT DATE	Semi Annually, 29/03, 29/09
7	REDEMPTION DATE	29/03/2042 – 100%
8	LAST INTEREST PAYMENT DATE	29/03/2023
9	QUANTUM (Rs.)	2,80,00,000.00 (Rs. Two Crore Eighty Lac Only)
10	PRICE (Rs.)	103.4300
11	YIELD	Annualise 7.6450%,
12	DEAL DATE	05.07.2023 at DEAL TIME : 12.00 P.M.
13	VALUE DATE	06.07.2023
14	PRINCIPAL AMOUNT (Rs.)	2,89,60,400.00
15	NO. OF DAYS	97 days(Last IP Dt: 29/03/2023)
16	ACCRUED/EX-INTEREST (Rs.)	5,92,238.89
17	SETTLEMENT AMOUNT (Rs.)	2,95,52,638.89 (Rs. Two Crore Ninety Five Lac Fifty Two Thousand Six Hundred Thirty Eight and Paise Eighty Nine Only)
18	OUR SGL A/C NO.	03
19	SGL BANK A/C NO.	415 241 492
20	SETTLEMENT MODE	NDS
21	PAN NO.	AAALM0042L
22	LEI No.	335800JHQJCQVE6DZN65

You are Authorized to settle the Transaction and Debit our Saving A/C No. 415 241 492 and also credit the above said Security to our SGL A/C No. 03.

Yours faithfully.

AUTHORISED SIGNATORY
B.E.S.& T. UNDERTAKING

Annexure 16

BEST Unddertaking
MYT Petition Formats - Distribution & Retail Supply
Form 16 : Billing Efficiency and Collection Efficiency

Year : FY 2022-23

Category	No. of consumers (Nos.)			Input Energy (MU)	Energy Sales (MU)					Amount Billed (Rs. Crore)			Amount Collected (Rs. Crore)		
					Metered Sales$										
	Metered Consumers	Unmetered Consumers	Total		Based on Meter Reading	Assessed Sales	Total	Un metered Sales	Total Sales	Metered	Un metered	Total	Metered	Un metered	Total
HT Category															
HT - I Industry	37	-	37		165.58	-	165.58	-	165.58	127.62	-	127.62	124.73	-	124.73
HT - II Commercial	93	-	93		219.93	-	219.93	-	219.93	223.96	-	223.96	222.77	-	222.77
HT - III Group Housing	12	-	12		32.40	-	32.40	-	32.40	23.64	-	23.64	23.48	-	23.48
HT - IV Railways, Metro, Monorail	3	-	3		2.11	-	2.11	-	2.11	2.27	-	2.27	1.88	-	1.88
HT - V (A) Public Services (Govt. Hospitals and Educational Institutions)	4	-	4		27.76	-	27.76	-	27.76	19.74	-	19.74	20.59	-	20.59
HT - V (B) Public Services (Others)	46	-	46		188.73	-	188.73	-	188.73	157.25	-	157.25	159.22	-	159.22
HT - VI Electrical Vehicle Charging	-	-	-		-	-	-	-	-	-	-	-	-	-	-
Sub-total	**195**	-	**195**		**636.52**	-	**636.52**	-	**636.52**	**554.48**	-	**554.48**	**552.66**	-	**552.66**
LT Category															
LT - I (A) Residential (BPL)	68	-	68	4,678.68	0.03	-	0.03	-	0.03	0.01	-	0.01	0.01	-	0.01
LT - I (B) Residential	7,69,247	-	7,69,247		1,992.47	49.00	2,041.47	-	2,041.47	1,607.45	-	1,607.45	1,624.18	-	1,624.18
0-100 units															
101-300 units															
301-500 units															
>500 units															
LT - II (a) Commercial<20kW	2,52,552	-	2,52,552		798.09	22.00	820.09	-	820.09	820.00	-	820.00	826.51	-	826.51
LT - II (b) Commercial >20 kW & <=50 kW	5,809	-	5,809		172.67	-	172.67	-	172.67	195.38	-	195.38	193.76	-	193.76
LT - II (c) Commercial >50 kW	3,068	-	3,068		365.79	-	365.79	-	365.79	406.20	-	406.20	404.45	-	404.45
LT - III (A) Industry (upto 20 kW)	8,108	-	8,108		99.11	4.00	103.11	-	103.11	69.29	-	69.29	68.74	-	68.74
LT - III (B) Industrial (above 20 kW)	1,002	-	1,002		79.53	-	79.53	-	79.53	69.71	-	69.71	69.78	-	69.78
LT - IV (A) Public Services (Govt. Hospitals and Educational Institutions)	664	-	664		61.03	-	61.03	-	61.03	43.05	-	43.05	43.11	-	43.11
LT - IV (B) Public Services (Others)	6,933	-	6,933		168.04	1.00	169.04	-	169.04	128.07	-	128.07	127.97	-	127.97
LT - V (A) Agriculture-Pumpsets		-	-			-	-	-	-		-	-	-	-	
LT - V (B) Agriculture-Others	1	-	1		0.05	-	0.05	-	0.05	0.03	-	0.03	0.02	-	0.02
LT - VI Electrical Vehicle Charging	23	-	23		18.49	-	18.49	-	18.49	12.53	-	12.53	12.79	-	12.79
Sub-total	**10,47,474**	-	**10,47,474**		**3,755.31**	**76.00**	**3,831.31**	-	**3,831.31**	**3,351.73**	-	**3,351.73**	**3,371.33**	-	**3,371.33**
Public Lighting					15.49	-	15.49	-	15.49						
Total	**10,47,669**	-	**10,47,669**		**4,407.32**	**76.00**	**4,483.32**	-	**4,483.32**	**3,906.21**	-	**3,906.21**	**3,923.98**	-	**3,923.98**
Total in %															

2936.83 3046.22
969.38 877.76

Note
$ - Assessed consumption for each category shall be indicated seperately
* - Arrears collected would be included under Amount Collected, but are to be shown separately under these columns

The statement are verified from the data given by IT dept.

1/11/24

THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT *

Year : FY 2023-24

Category	No. of consumers (Nos.)			Input Energy (MU)	Energy Sales (MU)					Amount Billed (Rs. Crore)			Amount Collected (Rs. Crore)		
					Metered Sales$										
	Metered Consumers	Unmetered Consumers	Total		Based on Meter Reading	Assessed Sales	Total	Unmetered Sales	Total Sales	Metered	Unmetered	Total	Metered	Unmetered	Total
HT Category															
HT - I Industry	37	0	37		172.20	-	172.20	-	172.20	153.64	-	153.64	152.14	-	152.14
HT - II Commercial	90	0	90		214.45	-	214.45	-	214.45	248.67	-	248.67	248.05	-	248.05
HT - III Group Housing	12	0	12		35.07	-	35.07	-	35.07	26.27	-	26.27	26.87	-	26.87
HT - IV Railways, Metro, Monorail	3	0	3		2.32	-	2.32	-	2.32	2.67	-	2.67	3.30	-	3.30
HT - V (A) Public Services (Govt. Hospitals and Educational Institutions)	4	0	4		30.24	-	30.24	-	30.24	23.95	-	23.95	23.69	-	23.69
HT - V (B) Public Services (Others)	49	0	49		201.53	-	201.53	-	201.53	195.38	-	195.38	196.69	-	196.69
HT - VI Electrical Vehicle Charging	0	0	0		-	-	-	-	-	-	-	-	-	-	-
Sub-total	**195**	**0**	**195**		**655.82**	-	**655.82**	-	**655.82**	**650.59**	-	**650.59**	**650.74**	-	**650.74**
LT Category															
LT - I (A) Residential (BPL)	70	0	70		0.04	-	0.04	-	0.04	0.01	-	0.01	0.01	-	0.01
LT - I (B) Residential	770751	0	770751		2,122.05	38.00	2,160.05	-	2,160.05	1,861.61	-	1,861.61	1,874.61	-	1,874.61
0-100 units			0	4,944.06								-			-
101-300 units			0									-			-
301-500 units			0									-			-
>500 units			0									-			-
LT - II (a) Commercial<20kW	252839	0	252839		855.49	18.00	873.49	-	873.49	994.47	-	994.47	999.48	-	999.48
LT - II (b) Commercial >20 kW & <=50 kW	5852	0	5852		184.37	-	184.37	-	184.37	209.76	-	209.76	211.71	-	211.71
LT - II (c) Commercial >50 kW	3118	0	3118		393.86	-	393.86	-	393.86	425.29	-	425.29	425.59	-	425.59
LT - III (A) Industry (upto 20 kW)	8033	0	8033		104.72	2.00	106.72	-	106.72	82.25	-	82.25	82.52	-	82.52
LT - III (B) Industrial (above 20 kW)	977	0	977		78.82	-	78.82	-	78.82	75.06	-	75.06	75.81	-	75.81
LT - IV (A) Public Services (Govt. Hospitals and Educational Institutions)	677	0	677		64.41	-	64.41	-	64.41	52.88	-	52.88	49.40	-	49.40
LT - IV (B) Public Services (Others)	6853	0	6853		177.79	1.00	178.79	-	178.79	153.42	-	153.42	156.32	-	156.32
LT - V (A) Agriculture-Pumpsets			0				-	-	-						
LT - V (B) Agriculture-Others	2	0	2		0.16	-	0.16	-	0.16	0.11	-	0.11	0.11	-	0.11
LT - VI Electrical Vehicle Charging	290	0	290		27.00	-	27.00	-	27.00	23.76	-	23.76	23.79	-	23.79
Sub-total	**1049460**	**0**	**1049460**		**4,008.71**	**59.00**	**4,067.71**	-	**4,067.71**	**3,878.61**	-	**3,878.61**	**3,899.36**	-	**3,899.36**
Public Lighting					16.62	-	16.62	-	16.62						
Total	**1049655**	**0**	**1049655**		**4,681.15**	**59.00**	**4,740.15**	-	**4,740.15**	**4,529.20**	-	**4,529.20**	**4,550.10**	-	**4,550.10**
Total in %															
Total in %															
												3438.61			3431.72
												1,090.59			1,118.38

Note

$ - Assessed consumption for each category shall be indicated seperately

* - Arrears collected would be included under Amount Collected, but are to be shown separately under these columns

The statement is verified from the datagiven by IT dept.

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Year : FY 2022-23

Category	Arrears Collected (Rs. Crore)*			Receivables at beginning of year (Rs. Crore)			Receivables at end of year (Rs. Crore)			Billing Efficiency (%)			Collection Efficiency (%)		
	Metered	Un metered	Total	Metered	Un metered	Total	Metered	Un metered	Total	Metered	Un metered	Total	Metered	Un metered	Total
HT Category															
HT - I Industry	15.90	-	15.90	10.99	-	10.99	13.38	-	13.38				97.74%		97.74%
HT - II Commercial	32.11	-	32.11	24.72	-	24.72	28.75	-	28.75				99.47%		99.47%
HT - III Group Housing	1.10	-	1.10	1.12	-	1.12	1.91	-	1.91				99.32%		99.32%
HT - IV Railways, Metro, Monorail	1.28	-	1.28	0.35	-	0.35	0.60	-	0.60				82.48%		82.48%
HT - V (A) Public Services (Govt. Hospitals and Educational Institutions)	1.68	-	1.68	1.51	-	1.51	1.43	-	1.43				104.30%		104.30%
HT - V (B) Public Services (Others)	11.59	-	11.59	9.59	-	9.59	13.09	-	13.09				101.26%		101.26%
HT - VI Electrical Vehicle Charging	-	-	-	-	-	-	-	-	-						
Sub-total	**63.66**	-	**63.66**	**48.27**	-	**48.27**	**59.16**	-	**59.16**				99.67%		99.67%
LT Category															
LT - I (A) Residential (BPL)	0.00	-	0.00	0.00	-	0.00	0.00	-	0.00				107.37%		107.37%
LT - I (B) Residential	421.48	-	421.48	55.17	-	55.17	48.73	-	48.73				101.04%		101.04%
0-100 units									-						
101-300 units									-						
301-500 units									-						
>500 units									-						
LT - II (a) Commercial<20kW	263.30	-	263.30	32.38	-	32.38	26.90	-	26.90				100.79%		100.79%
LT - II (b) Commercial >20 kW & <=50 kW	33.82	-	33.82	17.53	-	17.53	18.07	-	18.07				99.17%		99.17%
LT - II (c) Commercial >50 kW	56.21	-	56.21	37.53	-	37.53	42.88	-	42.88				99.57%		99.57%
LT - III (A) Industry (upto 20 kW)	5.70	-	5.70	5.20	-	5.20	5.76	-	5.76				99.21%		99.21%
LT - III (B) Industrial (above 20 kW)	9.44	-	9.44	7.18	-	7.18	6.95	-	6.95				100.10%		100.10%
LT - IV (A) Public Services (Govt. Hospitals and Educational Institutions)	4.82	-	4.82	5.98	-	5.98	6.55	-	6.55				100.14%		100.14%
LT - IV (B) Public Services (Others)	16.23	-	16.23	23.53	-	23.53	26.73	-	26.73				99.92%		99.92%
LT - V (A) Agriculture-Pumpsets		-	-		-	-		-							
LT - V (B) Agriculture-Others	(0.00)	-	(0.00)	(0.01)	-	(0.01)	0.00	-	0.00				68.04%		68.04%
LT - VI Electrical Vehicle Charging	(0.03)	-	(0.03)	3.31	-	3.31	1.18	-	1.18				102.03%		102.03%
Sub-total	**810.97**	-	**810.97**	**187.81**	-	**187.81**	**183.75**	-	**183.75**				100.58%		100.58%
Public Lighting															
Total	**874.64**	-	**874.64**	**236.08**	-	**236.08**	**242.91**	-	**242.91**				#######		100.46%
Total in %										95.82%		95.82%			

Note

$ - Assessed consumption for each category shall be

* - Arrears collected would be included under Amou

The statement is verified from the data given by IT dept.

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THE BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING * INTERNAL AUDIT DEPARTMENT

Year : FY 2023-24

Category	Arrears Collected (Rs. Crore)*			Receivables at beginning of year (Rs. Crore)			Receivables at end of year (Rs. Crore)			Billing Efficiency (%)			Collection Efficiency (%)		
	Metered	Unmetered	Total	Metered	Unmetered	Total	Metered	Unmetered	Total	Metered	Unmetered	Total	Metered	Unmetered	Total
HT Category															
HT - I Industry	9.87	-	9.87	13.38	-	13.38	13.76	-	13.76				99.02%		99.02%
HT - II Commercial	32.02	-	32.02	28.75	-	28.75	30.41	-	30.41				99.75%		99.75%
HT - III Group Housing	0.51	-	0.51	1.91	-	1.91	1.94	-	1.94				102.28%		102.28%
HT - IV Railways, Metro, Monorail	3.00	-	3.00	0.60	-	0.60	0.46	-	0.46				123.46%		123.46%
HT - V (A) Public Services (Govt. Hospitals and Educational Institutions)	0.27	-	0.27	1.43	-	1.43	1.91	-	1.91				98.90%		98.90%
HT - V (B) Public Services (Others)	7.72	-	7.72	13.09	-	13.09	15.16	-	15.16				100.67%		100.67%
HT - VI Electrical Vehicle Charging	-	-	-	-	-	-	-	-	-						
Sub-total	**53.39**	-	**53.39**	**59.16**	-	**59.16**	**63.63**	-	**63.63**				100.02%		100.02%
LT Category															
LT - I (A) Residential (BPL)	0.01	-	0.01	0.00	-	0.00	0.00	-	0.00				96.97%		96.97%
LT - I (B) Residential	459.00	-	459.00	48.73	-	48.73	43.32	-	43.32				100.70%		100.70%
0-100 units			-			-			-						
101-300 units			-			-			-						
301-500 units			-			-			-						
>500 units			-			-			-						
LT - II (a) Commercial<20kW	290.72	-	290.72	26.90	-	26.90	24.08	-	24.08				100.50%		100.50%
LT - II (b) Commercial >20 kW & <=50 kW	40.18	-	40.18	18.07	-	18.07	16.18	-	16.18				100.93%		100.93%
LT - II (c) Commercial >50 kW	56.85	-	56.85	42.88	-	42.88	41.97	-	41.97				100.07%		100.07%
LT - III (A) Industry (upto 20 kW)	8.32	-	8.32	5.76	-	5.76	6.20	-	6.20				100.33%		100.33%
LT - III (B) Industrial (above 20 kW)	8.95	-	8.95	6.95	-	6.95	6.85	-	6.85				101.01%		101.01%
LT - IV (A) Public Services (Govt. Hospitals and Educational Institutions)	5.28	-	5.28	6.55	-	6.55	8.89	-	8.89				93.42%		93.42%
LT - IV (B) Public Services (Others)	31.08	-	31.08	26.73	-	26.73	22.77	-	22.77				101.89%		101.89%
LT - V (A) Agriculture-Pumpsets			-												
LT - V (B) Agriculture-Others	0.04	-	0.04	0.00	-	0.00	0.03	-	0.03				101.37%		101.37%
LT - VI Electrical Vehicle Charging	2.02	-	2.02	1.18	-	1.18	2.87	-	2.87				100.14%		100.14%
Sub-total	**902.44**	-	**902.44**	**183.75**	-	**183.75**	**173.17**	-	**173.17**				100.54%		100.54%
Public Lighting															
Total	**955.84**	-	**955.84**	**242.91**	-	**242.91**	**236.80**	-	**236.80**	**95.88%**		**95.88%**	**#######**		**100.46%**
Total in %															
Total in %															

Note

$ - Assessed consumption for each category shall be

* - Arrears collected would be included under Amo

The statement is verified from the data given by IT dept

3/11/24

Brihan Mumbai Electric Supply & Transport Undertaking
Balance Sheet of Electric Supply as at 30th Sept. 2024

EQUITY AND LIABILITIES	Notes	As at 30th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
Shareholders' funds			
Reserves and surplus	2	5,06,123.56	4,83,379.33
		5,06,123.56	**4,83,379.33**
Non-current liabilities			
Long- Term Borrowings	3	2,11,792.99	**1,88,450.09**
Other non-current liabilities	4	63,139.96	56,631.54
		2,74,932.94	**2,45,081.63**
Current liabilities			
Trade payables	5	49,583.42	48,010.98
Other current liabilities	6	2,89,130.23	2,49,253.77
		3,38,713.65	**2,97,264.76**
TOTAL		**11,19,770.15**	**10,25,725.72**
ASSETS			
Non-current assets			
Fixed assets			
Tangible assets	7	1,57,861.24	1,62,306.93
Capital work-in-progress		7,213.04	4,603.68
Non-current investments	8	7,247.01	7,022.01
Long-term loans and advances	9	6,088.26	6,073.26
Other non-current assets	10	1,429.11	1,368.58
		1,79,838.66	**1,81,374.46**
Current assets			
Inventories	11	5,311.89	965.80
Trade receivables	12	61,646.84	52,803.15
Cash and Bank Balances	13	2,28,257.83	1,77,483.85
Short-term loans and advances	14	6,43,407.82	6,11,158.80
Other current assets	15	1,307.33	1,939.89
		9,39,931.72	**8,44,351.49**
TOTAL		**11,19,770.15**	**10,25,725.72**
Significant accounting policies	1		

Brihan Mumbai Electric Supply & Transport Undertaking
Statement of Profit and Loss for the period 01/04/2024 to 30/09/2024

	Notes	For the year ended 30th Sept. 2024 (in lakhs)	1st April 2023 - 31st Mar. 2024 (in lakhs)
Income			
Revenue from operation (gross)	**16**	2,45,869.40	4,27,821.77
Less: Excise duty			-
Revenue from operation (net)		**2,45,869.40**	**4,27,821.77**
Other income	**17**	3,084.89	6,460.03
Total Revenue		**2,48,954.29**	**4,34,281.80**
Expenses			
Purchase of electricity		1,69,139.21	3,16,641.06
Emloyee benefit expense	**18**	32,123.93	58,468.06
Finance cost	**19**	9,991.94	17,514.65
Depreciation	**7**	5,812.29	11,304.33
Other expenses	**20**	8,795.48	22,120.87
Total expenses		**2,25,862.84**	**4,26,048.98**
Profit before tax and Exceptional items		**23,091.44**	**8,232.82**
Exceptional items		-	0.00
Profit before tax		**23,091.44**	**8,232.82**

Notes forming part of financial statement

		As at 30th Sept. 2024 (in lakhs)	As at 31st March 2024(in lakhs)
2	**RESERVES AND SURPLUS**		
	STATUTORY RESERVE		
	(As per BMC Act, 1888)		
A.	Sinking Fund for Public Loan	-	-
	Addition during the year	-	-
		-	-
	Less: Deduction During the Year		
		-	-
B.	*Best Staff Benefit Fund	393.83	333.11
	Addition during the year	15.73	60.72
		409.56	393.83
	Less: Adj/Deduction During the Year	-	-
		409.56	**393.83**
C.	Motor Vehicles(Third Party Ins Reserve)		
	Addition/ Adj during the year		
	Less: Adj/Deduction During the Year		
	Total of A+B+C	**409.56**	**393.83**
	NON-STATUTORY RESERVE		
D.	Property Insurance Reserve	10,014.73	10,014.73
	Addition during the year	-	-
		10,014.73	10,014.73
	Less:Adj/ Deduction During the Year	-	0
		10,014.73	**10,014.73**
E.	Third Party Insurance Reserve		
	Addition during the year		
	Less: Deduction During the Year		
F.	Depreciation Fund		
	Addition during the year	(0.01)	**0.00**
		(0.01)	0.00
	Less: Deduction during the year		
		(0.01)	0.00
G.	Fidelity Insurance Reserve	7.03	7.03
	Addition/Adj during the year	-	-
		7.03	7.03
	Less: Adj/Deduction During the Year	-	-
		7.03	**7.03**

Notes forming part of financial statement

		As at 30th Sept. 2024 (in lakhs)	As at 31st March 2024(in lakhs)
H.	Grant/Consumer Cont.	44,917.13	40,585.12
	Addition/ Adj during the year	457.77	4,332.01
		45,374.90	44,917.13
	Less: Deduction / Adjustments During the Year		
		45,374.90	**44,917.13**
I.	BEST Group Ins. Fund	0.00	(11.91)
	Addition during the year	0.01	11.91
		0.01	0.00
	Less: Deduction/Adj During the Year		
		0.01	**0.00**
J.	Electric Supply Contingencies Reserve	8,456.79	7,658.64
	Addition/Adj during the year	1.02	798.14
		8,457.80	8,456.79
	Less: Deduction During the Year	-	-
		8,457.80	8,456.79
	less: Invested amount as per regulation & investable amount	-	-
		8,457.80	**8,456.79**
K.	* Generation Of Electricity Fund	19,687.30	19,687.30
	Addition/Adj during the year	-	-
		19,687.30	19,687.30
	Less: Deduction During the Year		
		19,687.30	**19,687.30**
	Total of D+E+F+G+H+I+K	**83,541.76**	**83,082.98**
J.	*Minimum Cash Balance as per Section 460KK1	0.50	0.50
	Addition/Adj during the year		
		0.50	0.50
	Less: Deduction During the Year		
		0.50	**0.50**
K.	B. E. S. T. Staff Amenities Reserve	0.30	**0.30**
	Provided during the year	-	-
		0.30	**0.30**
	Less: Deduction During the Year	-	-
		0.30	**0.30**
L.	Obsolescence of stores	14.53	14.53
	Addition/Adj during the year		
		14.53	14.53
	Less: Deduction / Adjustments During the Year	-	-
		14.53	**14.53**
M.	Surplus		
	Opening balances as per last financials	3,99,887.18	3,88,386.88
	Add: Profit/(Loss) for the year	23,091.44	8,232.82
	Less: Prior period items	821.72	4,065.62
		4,22,156.90	**4,00,685.32**
	Deduct : Transfer to Contingency reserve fund	-	(798.14)
		4,22,156.90	**3,99,887.18**
	Total of J+ K+L+M	**4,22,172.23**	**3,99,902.51**
	Total	**5,06,123.56**	**4,83,379.33**

Notes forming part of financial statement

		As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
3	**Long-term borrowings**		
	Secured loan		
	Secured against first charge on plant & machinery from Canara Bank^		
	Long Term finance *	-	-
	Unsecured loan		
	APDRP Loan**	164.82	10.79
	Short Term Finance *	51,000.00	30380.15
	REC #	15,812.71	19,765.89
	TATA BILL Discounting	1,44,815.46	1,38,293.26
	DEPOSIT WITH BEST FUND (FROM SBF)		-
		2,11,792.99	**1,88,450.09**

^ Rate of Interest 12.95% and secured against first charge on plant & machinery

** The maturity period of the loan will be 20 years and repayments being made in 20 installments. The loan carries interest @ 10.50%.

* The repayment to be made in 6 monthly installments. The loan carries interest @ 10.00%

Rate of Interest 11.75%

		As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
4	**Other Non-Current Liabilities**		
	Security Deposit		
	- Deposit from Employees	33.77	34.51
	- Deposit from Customer	63,106.19	56,597.03
		63,139.96	**56,631.54**

		As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
5	**Trade payables**		
	Trade payables *	49,583.42	48,010.98
		49,583.42	**48,010.98**

* The Company has not received information from Creditors regarding their status under the Micro, disclosure relating to amounts unpaid as on 31st March 2018 together with Interest paid / payable have not been ascertained.

		As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
6	**Other current liabilities**		
	Statutory Liabiliities (Contributions to PF,Pension, ESIC, withholding Taxes,VAT etc.)	2,31,200.37	1,84,414.29
	Empolyee dues payable	9,374.90	2,893.66
	Current maturities for long term borrowings	-	4,174.76
	Other payables	48,554.95	57,771.06
		2,89,130.23	**2,49,253.77**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
8 Non-current investments		
Unquoted Bond	425.00	
General Securities :		
8.20% Oil Bond 2023	-	0.00
8.83%IRFC Bond 2034	350.00	350.00
9.97%APPFCL Bond 2024	-	0.00
9.97%APPFCL Bond 2024	-	0.00
	775.00	**350.00**
BEST Group Insurance Scheme Fund		
Central Bank of India Fort Branch		
Indian Bank Fort Branch		
Bank of India Electric House		
Punjab National Bank Colaba		
Central Bank of India Pedder Road Branch	-	-
Canara Bank Colaba	-	-
Syndicate Bank,Fort	-	-
State Bank of Patiala	-	-
	-	-
Generation of Electricity Fund Investment	-	200.00
Unquoted Shares		
Shares in Saraswat Co-op Bank	0.01	0.01
Contingencies Reserve Fund Investment	6,472.00	6,472.00
	6,472.01	**6,472.01**
Total	**7,247.01**	**7,022.01**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
9 Long term Loans and advances		
(Unsecured, Considered good)		
Deposits	6,088.26	6,073.26
	6,088.26	**6,073.26**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
10 Other Non - Current Assets (Considered good)		
Deferred Revenue Expenditure		
Staff Benefit Fund Investment (Fixed Deposit)	791.78	731.25
Fixed Deposit with Chetna Co - operative Bank	166.32	166.32
Term Deposit with Canara Bank for LC	471.01	471.01
	1,429.11	**1,368.58**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
11 Inventories		
Inventories	5,311.89	965.80
	5,311.89	**965.80**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
12 Trade receivables		
Unsecured, considered good stated otherwise		
Debts outstanding for a period exceeding six months from the date they are due for payment	**48,951.45**	**39,575.29**
	48,951.45	**39,575.29**
Other receivables	12,695.38	**13,227.87**
	12,695.38	**13,227.87**
Total	**61,646.84**	**52,803.15**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
13 Cash and bank balances		
Cash and cash equivalents		
Balance with banks in Current accounts	2,57,005.94	1,99,350.32
Cash on hand	(28,748.10)	(21,866.47)
	2,28,257.83	**1,77,483.85**
Balance in banks for margin money		
Staff Benefit Fund Investment (Fixed Deposit)	791.78	731.25
Fixed Deposit with Chetna Co - operative Bank	166.32	166.32
Term Deposit with Canara Bank for LC	471.01	471.01
CLTD A/C (FAME) WITH BANK OF INDIA		
	1,429.11	**1,368.58**
Less: Shown under other non current assets	(1,429.11)	(1,368.58)
	2,28,257.83	**1,77,483.85**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)
14 Short term Loans and advances		
(Unsecured, Considered good)		
Deposits		
Other loans and advances		
Loans to employees	79.04	50.79
Prepaid expenses	292.22	325.06
Advances recoverable in cash or kind		
- Others	6,464.48	6,270.44
- From Transport Division	6,34,674.96	6,05,634.42
- From suppliers	1,897.13	(1,121.91)
	6,43,407.82	**6,11,158.80**

	As at 30 th Sept. 2024 (in lakhs)	As at 31st March 2024 (in lakhs)

15 Other current assets

Interest Accrued but not received :		
Accrued Interest On contingencey reserve	0.40	157.06
Interest Accrued On Fixed And Call Deposit	116.67	116.67
Accrued Interest On Generation Of Electricty Fund	1,190.26	1,666.16
Accrued Interest On Staff benefit Fund	-	-
Accrued Interest On BEST Group Insu. Fund	-	-
	1,307.33	**1,939.89**

		Year ended 30th Sept. 2024 (in lakhs)	Year ended 31ST MARCH,2024 (in lakhs)
16	**Revenue from operations**		
	Sale of service	2,45,756.91	4,26,608.01
	Other operating income		
	Sale of Scrap	112.49	1213.75
	Revenue from operations (Gross)	**2,45,869.40**	**4,27,821.77**
	Sale of Service		
	Distribution of energy by meter	2,41,637.40	418514.48
	Distribution of energy	606.21	1121.68
	Repairs & Maintenance of Street lighting	3,513.31	6971.85
		2,45,756.91	**4,26,608.01**
17	**Interest income on**		
	Bank deposits	0.00	67.90
	Rent of Building & land	520.65	399.32
	E. D collection & D P charges	1,790.29	3832.93
	Profit on Sale of Assets	-	983.94
	Miscellaneous income	0.29	10.08
	Discount, sundry balances written back	391.96	437.27
	Advertisement receipts	381.69	728.59
		3,084.89	**6,460.03**

	Year ended 30th Sept. 2024 (in lakhs)	Year ended 31ST MARCH,2024 (in lakhs)
18 Employee benefit expense		
Salaries, wages and bonus	29,401.17	44,061.77
Contribution to provident and	2,638.09	14,216.18
Staff welfare expense	84.66	190.11
	32,123.93	**58,468.06**
19 Finance cost		
Interest expense	8,349.52	14,950.98
Other borrowing cost	1,642.42	2,563.68
	9,991.94	**17,514.65**
20 Other expenses		
Power, Fuel and Electricity	266.64	453.28
Rent	60.25	1,210.78
Repairs and Maintenance		
Building	138.27	669.32
Machinery	134.22	286.39
Others	1,228.27	3,177.41
Insurance	-	-
Incentive charges	798.46	1,600.24
Advertisement Expenses	12.36	171.31
Network charges	2,295.74	3,237.67
Payment to Auditors (Refer details Below)	-	300.00
Printing and Stationery	69.90	182.99
Communication cost	103.37	676.48
Travelling and Conveyance	385.74	1,448.61
Legal and Professional Fees	231.70	438.36
Rates and taxes	177.92	1.43
Bad debts	-	660.00
Bank Charges	53.16	368.36
Discount on Electricity charges	1,319.51	2,622.51
Permanent Reinstatement	506.77	2,644.52
Other Establishment Expenses	961.03	1,884.59
Best staff amenities reserve expense	52.20	82.57
Property insurance fund	-	-
Provision for Obsolescence of stores	-	4.05
Transfer to MCGM u/s 460 KK(2)e		
	8,795.48	**22,120.87**
Payment to auditors		
As auditor		
Audit fee	-	300.00
Tax audit fee		
Limited review		
	-	**300.00**

Annexure 18

EC Trade Report (Buy/Sell)

Date: 10-Jul-24

Trade Date	10-Jul-24
Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Portfolio ID	W2MH0BST0001
Portfolio Name	BEST Undertaking
State	Maharashtra
Registration Number	MH0MBESTWR01IE
Financial Year	2024-25

Trade Obligation(Rs.)	31872000.00
Net Exchange Fees	0.00
Exchange Fees IGST/UTGST	0.00
Exchange Fees SGST	0.00
Exchange Fees CGST	0.00
GST On Buy Trade	5736960.00
GST On Sell Trade	0.00
TCS Amount	0.00
TDS Amount	0.00
Funds Pay-In	37608960.00
Funds Pay-Out	0.00

Section A - Total (B+C)

Certificate Number	Certificate for Financial Year	Symbol	Invoice (Rs.)	Charges & Taxes (Rs.)	Pay-In Amount (Rs.)	Pay-Out Amount (Rs.)
C-IEX_REC000233	249000	REC	31872000.00	5736960.00	37608960.00	0.00

Section B - Trade Details

Certificate Number	Certificate for Financial Year	Buy/Sell	Symbol	Rate (Rs.)	Quantity	Invoice (Rs.)
C-IEX_REC000233	249000	Buy	REC	128.00	249000.00	31872000.00

Section C - Charges and Taxes Details

Certificate Number	Buy/Sell	Symbol	Exchange Fees (Rs.)	Discount on Exchange Fees (Rs.)	Rebate on Exchange Fees (Rs.)	Net Exchange Fees (Rs.)	IGST/UTGST on Exchange Fees (Rs.)	SGST on Exchange Fees (Rs.)	CGST on Exchange Fees (Rs.)	GST on Trade (Rs.)	TCS (Rs.)	TDS (Rs.)	Charges & Taxes Total
C-IEX_REC000233	Buy	REC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5736960.00	0.00	0.00	5736960.00

** This is a computer generated report*

Certificate of Purchase of Renewable Energy Certificate

INDIAN ENERGY EXCHANGE LTD.

Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000233 **Issued On: 10-Jul-2024**

BEST Undertaking

Number of Certificates: 249000

This certifies that BEST Undertaking is the holder of 249000 non transferable Renewable energy certificate(s) bought on 10-Jul-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

This is a computer-generated statement hence doesn’t require signature.

POWER EXCHANGE INDIA LIMITED

Certificate of Purchase of REC(s)

Number C - PXMB07241515 **Issued On - 10-JUL-2024**

Serial No. - PXI/ 10072024/REC/01515

Number of Certificates - 248500

This certifies that BEST is the holder of 248500 non transferable Renewable Energy Certificate(s) bought on 10-JUL-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

Regd. Office: Power Exchange India Ltd.9th Floor, 901 ,Sumer Plaza,Marol Maroshi Road,Marol Andheri (East),Mumbai 400 059, India.

CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in

Note: - This is a computer generated statement hence doesn't require signature.

Auction date: 10-Jul-2024

REC Obligation Report Without GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price(Rs. / Certificate)	Trade Value (Rs.)	Regulatory Fees (Rs.)	Exchange Transaction Charges				Tax Collection at Source (TCS)			Tax Deduction at Source (TDS)			Net Obligation (Rs.)
									Transaction Charges (Rs.)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	
S1020	S1020	NA	MH0MBESTWR01PE	REC	248500	128.00	31808000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31808000.00
	Total						31808000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31808000.00
Total							31808000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31808000.00
Net Obligation							31808000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31808000.00

REC Obligation Report With GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price (Rs. / Certificate)	Trade Value (Rs.)	GST on Trade Value (Rs)			Total GST on Trade Value (Rs)	Net Obligation without GST on Trade Value(Rs.)	Net Obligation with GST on Trade Value (Rs)
								CGST (Rs)	SGST (Rs)	IGST (Rs)	A	B (Please refer above table)	(A+B)
S1020	S1020	NA	MH0MBESTWR01PE	REC	248500	128.00	31808000.00	14400.00	14400.00	5696640.00	5725440.00	31808000.00	37533440.00
	Total						31808000.00	14400.00	14400.00	5696640.00	5725440.00	31808000.00	37533440.00
Total							31808000.00	14400.00	14400.00	5696640.00	5725440.00	31808000.00	37533440.00
Net Obligation							31808000.00	14400.00	14400.00	5696640.00	5725440.00	31808000.00	37533440.00

Note 1:- Tax Collection at Source (TCS) is as per Ministry of Finance, Government of India, (Department of Revenue), Central Board of Indirect Taxes and Customs notification no 51/2018 - Central Tax dt. 13 September 2018. This is a system generated report and does not require signature.

Note 2:- Tax Deduction at Source (TDS) is applicable based on Ministry of Finance, Government of India ,(Department of Revenue), Central Board of Indirect Taxes and Customs vide their notification no 50/2018 - Central tax dated 13 September 2018. This is a system generated report and does not require signature.

Participant Report - EC

Date: 31-Jul-24

Trade Date	31-Jul-24
Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Selected Portfolio	1

Trade Obligation(Rs.)	41148000.00
Net Exchange Fees	0.00
Exchange Fees IGST/UTGST	0.00
Exchange Fees SGST	0.00
Exchange Fees CGST	0.00
GST On Buy Trade	7406640.00
GST On Sell Trade	0.00
TCS Amount	0.00
TDS Amount	0.00
Funds Pay-In	48554640.00
Funds Pay-Out	0.00

Section A - Total (B+C)

Portfolio ID	Portfolio ID NLDC	Symbol	Invoice (Rs.)	Charges & Taxes (Rs.)	Pay-In Amount (Rs.)	Pay-Out Amount (Rs.)
W2MH0BST0001	MH0MBESTWR01IE	REC	41148000.00	7406640.00	48554640.00	0.00

Section B - Trade Details

Portfolio ID	Portfolio ID NLDC	Buy/Sell	Symbol	Rate (Rs.)	Quantity	Invoice (Rs.)
W2MH0BST0001	MH0MBESTWR01IE	Buy	REC	120.00	342900.00	41148000.00

Section C - Charges and Taxes Details

Portfolio ID	Buy/Sell	Symbol	Exchange Fees (Rs.)	Discount on Exchange Fees (Rs.)	Rebate on Exchange Fees (Rs.)	Net Exchange Fees (Rs.)	IGST/UTGST on Exchange Fees (Rs.)	SGST on Exchange Fees (Rs.)	CGST on Exchange Fees (Rs.)	GST on Trade (Rs.)	TCS (Rs.)	TDS (Rs.)	Charges & Taxes Total
W2MH0BST0001	Buy	REC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7406640.00	0.00	0.00	7406640.00

** This is a computer generated report*

EC Trade Report (Buy/Sell)

Date: 31-Jul-24

Trade Date	31-Jul-24
Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Portfolio ID	W2MH0BST0001
Portfolio Name	BEST Undertaking
State	Maharashtra
Registration Number	MH0MBESTWR01IE
Financial Year	2024-25

Trade Obligation(Rs.)	41148000.00
Net Exchange Fees	0.00
Exchange Fees IGST/UTGST	0.00
Exchange Fees SGST	0.00
Exchange Fees CGST	0.00
GST On Buy Trade	7406640.00
GST On Sell Trade	0.00
TCS Amount	0.00
TDS Amount	0.00
Funds Pay-In	48554640.00
Funds Pay-Out	0.00

Section A - Total (B+C)

Certificate Number	Certificate for Financial Year	Symbol	Invoice (Rs.)	Charges & Taxes (Rs.)	Pay-In Amount (Rs.)	Pay-Out Amount (Rs.)
C-IEX_REC000274	591900	REC	41148000.00	7406640.00	48554640.00	0.00

Section B - Trade Details

Certificate Number	Certificate for Financial Year	Buy/Sell	Symbol	Rate (Rs.)	Quantity	Invoice (Rs.)
C-IEX_REC000274	591900	Buy	REC	120.00	342900.00	41148000.00

Section C - Charges and Taxes Details

Certificate Number	Buy/Sell	Symbol	Exchange Fees (Rs.)	Discount on Exchange Fees (Rs.)	Rebate on Exchange Fees (Rs.)	Net Exchange Fees (Rs.)	IGST/UTGST on Exchange Fees (Rs.)	SGST on Exchange Fees (Rs.)	CGST on Exchange Fees (Rs.)	GST on Trade (Rs.)	TCS (Rs.)	TDS (Rs.)	Charges & Taxes Total
C-IEX_REC000274	Buy	REC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7406640.00	0.00	0.00	7406640.00

** This is a computer generated report*

Certificate of Purchase of Renewable Energy Certificate

INDIAN ENERGY EXCHANGE LTD.

Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000274 **Issued On: 31-Jul-2024**

BEST Undertaking

Number of Certificates: 342900

This certifies that BEST Undertaking is the holder of 342900 non transferable Renewable energy certificate(s) bought on 31-Jul-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

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POWER EXCHANGE INDIA LIMITED

Certificate of Purchase of REC(s)

Number C - PXMB07241542 **Issued On - 31-JUL-2024**

Serial No. - PXI/ 31072024/REC/01542

Number of Certificates - 342100

This certifies that BEST is the holder of 342100 non transferable Renewable Energy Certificate(s) bought on 31-JUL-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

Regd. Office: Power Exchange India Ltd.9th Floor, 901 ,Sumer Plaza,Marol Maroshi Road,Marol Andheri (East),Mumbai 400 059, India.

CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in

Note: - This is a computer generated statement hence doesn't require signature.

Auction date: 31-Jul-2024

REC Obligation Report Without GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price(Rs. / Certificate)	Trade Value (Rs.)	Regulatory Fees (Rs.)	Exchange Transaction Charges				Tax Collection at Source (TCS)			Tax Deduction at Source (TDS)			Net Obligation (Rs.)
									Transaction Charges (Rs.)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	
S1020	S1020	NA	MH0MBESTWR01PE	REC	342100	120.00	41052000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41052000.00
	Total						41052000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41052000.00
Total							41052000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41052000.00
Net Obligation							41052000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41052000.00

REC Obligation Report With GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price (Rs. / Certificate)	Trade Value (Rs.)	GST on Trade Value (Rs)			Total GST on Trade Value (Rs)	Net Obligation without GST on Trade Value(Rs.)	Net Obligation with GST on Trade Value (Rs)
								CGST (Rs)	SGST (Rs)	IGST (Rs)	A	B (Please refer above table)	(A+B)
S1020	S1020	NA	MH0MBESTWR01PE	REC	342100	120.00	41052000.00	0.00	0.00	7389360.00	7389360.00	41052000.00	48441360.00
	Total						41052000.00	0.00	0.00	7389360.00	7389360.00	41052000.00	48441360.00
Total							41052000.00	0.00	0.00	7389360.00	7389360.00	41052000.00	48441360.00
Net Obligation							41052000.00	0.00	0.00	7389360.00	7389360.00	41052000.00	48441360.00

Note 1:- Tax Collection at Source (TCS) is as per Ministry of Finance, Government of India, (Department of Revenue), Central Board of Indirect Taxes and Customs notification no 51/2018 - Central Tax dt. 13 September 2018. This is a system generated report and does not require signature.

Note 2:- Tax Deduction at Source (TDS) is applicable based on Ministry of Finance, Government of India ,(Department of Revenue), Central Board of Indirect Taxes and Customs vide their notification no 50/2018 - Central tax dated 13 September 2018. This is a system generated report and does not require signature.

Participant Report - EC

Date: 14-Aug-24

Trade Date	14-Aug-24
Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Selected Portfolio	1

Trade Obligation(Rs.)	37370600.00
Net Exchange Fees	0.00
Exchange Fees IGST/UTGST	0.00
Exchange Fees SGST	0.00
Exchange Fees CGST	0.00
GST On Buy Trade	6726708.00
GST On Sell Trade	0.00
TCS Amount	0.00
TDS Amount	0.00
Funds Pay-In	44097308.00
Funds Pay-Out	0.00

Section A - Total (B+C)

Portfolio ID	Portfolio ID NLDC	Symbol	Invoice (Rs.)	Charges & Taxes (Rs.)	Pay-In Amount (Rs.)	Pay-Out Amount (Rs.)
W2MH0BST0001	MH0MBESTWR01IE	REC	37370600.00	6726708.00	44097308.00	0.00

Section B - Trade Details

Portfolio ID	Portfolio ID NLDC	Buy/Sell	Symbol	Rate (Rs.)	Quantity	Invoice (Rs.)
W2MH0BST0001	MH0MBESTWR01IE	Buy	REC	118.00	316700.00	37370600.00

Section C - Charges and Taxes Details

Portfolio ID	Buy/Sell	Symbol	Exchange Fees (Rs.)	Discount on Exchange Fees (Rs.)	Rebate on Exchange Fees (Rs.)	Net Exchange Fees (Rs.)	IGST/UTGST on Exchange Fees (Rs.)	SGST on Exchange Fees (Rs.)	CGST on Exchange Fees (Rs.)	GST on Trade (Rs.)	TCS (Rs.)	TDS (Rs.)	Charges & Taxes Total
W2MH0BST0001	Buy	REC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6726708.00	0.00	0.00	6726708.00

** This is a computer generated report*

EC Trade Report (Buy/Sell)

Date: 14-Aug-24

Trade Date	14-Aug-24
Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Portfolio ID	W2MH0BST0001
Portfolio Name	BEST Undertaking
State	Maharashtra
Registration Number	MH0MBESTWR01IE
Financial Year	2024-25

Trade Obligation(Rs.)	37370600.00
Net Exchange Fees	0.00
Exchange Fees IGST/UTGST	0.00
Exchange Fees SGST	0.00
Exchange Fees CGST	0.00
GST On Buy Trade	6726708.00
GST On Sell Trade	0.00
TCS Amount	0.00
TDS Amount	0.00
Funds Pay-In	44097308.00
Funds Pay-Out	0.00

Section A - Total (B+C)

Certificate Number	Certificate for Financial Year	Symbol	Invoice (Rs.)	Charges & Taxes (Rs.)	Pay-In Amount (Rs.)	Pay-Out Amount (Rs.)
C-IEX_REC000296	908600	REC	37370600.00	6726708.00	44097308.00	0.00

Section B - Trade Details

Certificate Number	Certificate for Financial Year	Buy/Sell	Symbol	Rate (Rs.)	Quantity	Invoice (Rs.)
C-IEX_REC000296	908600	Buy	REC	118.00	316700.00	37370600.00

Section C - Charges and Taxes Details

Certificate Number	Buy/Sell	Symbol	Exchange Fees (Rs.)	Discount on Exchange Fees (Rs.)	Rebate on Exchange Fees (Rs.)	Net Exchange Fees (Rs.)	IGST/UTGST on Exchange Fees (Rs.)	SGST on Exchange Fees (Rs.)	CGST on Exchange Fees (Rs.)	GST on Trade (Rs.)	TCS (Rs.)	TDS (Rs.)	Charges & Taxes Total
C-IEX_REC000296	Buy	REC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6726708.00	0.00	0.00	6726708.00

** This is a computer generated report*

Certificate of Purchase of Renewable Energy Certificate

INDIAN ENERGY EXCHANGE LTD.

Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000296 **Issued On: 14-Aug-2024**

BEST Undertaking

Number of Certificates: 316700

This certifies that BEST Undertaking is the holder of 316700 non transferable Renewable energy certificate(s) bought on 14-Aug-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

This is a computer-generated statement hence doesn't require signature.

POWER EXCHANGE INDIA LIMITED

Certificate of Purchase of REC(s)

Number C - PXMB08241555 **Issued On - 14-AUG-2024**

Serial No. - PXI/ 14082024/REC/01555

Number of Certificates - 316000

This certifies that BEST is the holder of 316000 non transferable Renewable Energy Certificate(s) bought on 14-AUG-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

Regd. Office: Power Exchange India Ltd.9th Floor, 901 ,Sumer Plaza,Marol Maroshi Road,Marol Andheri (East),Mumbai 400 059, India.

CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in

Note: - This is a computer generated statement hence doesn't require signature.

Auction date: 14-Aug-2024

REC Obligation Report Without GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price(Rs. / Certificate)	Trade Value (Rs.)	Regulatory Fees (Rs.)	Exchange Transaction Charges				Tax Collection at Source (TCS)			Tax Deduction at Source (TDS)			Net Obligation (Rs.)
									Transaction Charges (Rs.)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	
S1020	S1020	NA	MH0MBESTWR01PE	REC	316000	118.00	37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00
	Total						37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00
Total							37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00
Net Obligation							37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00

REC Obligation Report With GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price (Rs. / Certificate)	Trade Value (Rs.)	GST on Trade Value (Rs)			Total GST on Trade Value (Rs)	Net Obligation without GST on Trade Value(Rs.)	Net Obligation with GST on Trade Value (Rs)
								CGST (Rs)	SGST (Rs)	IGST (Rs)	A	B (Please refer above table)	(A+B)
S1020	S1020	NA	MH0MBESTWR01PE	REC	316000	118.00	37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00
	Total						37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00
Total							37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00
Net Obligation							37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00

Note 1:- Tax Collection at Source (TCS) is as per Ministry of Finance, Government of India, (Department of Revenue), Central Board of Indirect Taxes and Customs notification no 51/2018 - Central Tax dt. 13 September 2018. This is a system generated report and does not require signature.

Note 2:- Tax Deduction at Source (TDS) is applicable based on Ministry of Finance, Government of India ,(Department of Revenue), Central Board of Indirect Taxes and Customs vide their notification no 50/2018 - Central tax dated 13 September 2018. This is a system generated report and does not require signature.

Auction date: 14-Aug-2024

REC Obligation Report Without GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price(Rs. / Certificate)	Trade Value (Rs.)	Regulatory Fees (Rs.)	Exchange Transaction Charges				Tax Collection at Source (TCS)			Tax Deduction at Source (TDS)			Net Obligation (Rs.)
									Transaction Charges (Rs.)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	
S1020	S1020	NA	MH0MBESTWR01PE	REC	316000	118.00	37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00
	Total						37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00
Total							37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00
Net Obligation							37288000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37288000.00

REC Obligation Report With GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price (Rs. / Certificate)	Trade Value (Rs.)	GST on Trade Value (Rs)			Total GST on Trade Value (Rs)	Net Obligation without GST on Trade Value(Rs.)	Net Obligation with GST on Trade Value (Rs)
								CGST (Rs)	SGST (Rs)	IGST (Rs)	A	B (Please refer above table)	(A+B)
S1020	S1020	NA	MH0MBESTWR01PE	REC	316000	118.00	37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00
	Total						37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00
Total							37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00
Net Obligation							37288000.00	5787.90	5787.90	6700264.20	6711840.00	37288000.00	43999840.00

Note 1:- Tax Collection at Source (TCS) is as per Ministry of Finance, Government of India, (Department of Revenue), Central Board of Indirect Taxes and Customs notification no 51/2018 - Central Tax dt. 13 September 2018. This is a system generated report and does not require signature.

Note 2:- Tax Deduction at Source (TDS) is applicable based on Ministry of Finance, Government of India ,(Department of Revenue), Central Board of Indirect Taxes and Customs vide their notification no 50/2018 - Central tax dated 13 September 2018. This is a system generated report and does not require signature.

Participant Report - EC

Date: 28-Aug-24

Trade Date	28-Aug-24
Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Selected Portfolio	1

Trade Obligation(Rs.)	16100000.00
Net Exchange Fees	0.00
Exchange Fees IGST/UTGST	0.00
Exchange Fees SGST	0.00
Exchange Fees CGST	0.00
GST On Buy Trade	2898000.00
GST On Sell Trade	0.00
TCS Amount	0.00
TDS Amount	0.00
Funds Pay-In	18998000.00
Funds Pay-Out	0.00

Section A - Total (B+C)

Portfolio ID	Portfolio ID NLDC	Symbol	Invoice (Rs.)	Charges & Taxes (Rs.)	Pay-In Amount (Rs.)	Pay-Out Amount (Rs.)
W2MH0BST0001	MH0MBESTWR01IE	REC	16100000.00	2898000.00	18998000.00	0.00

Section B - Trade Details

Portfolio ID	Portfolio ID NLDC	Buy/Sell	Symbol	Rate (Rs.)	Quantity	Invoice (Rs.)
W2MH0BST0001	MH0MBESTWR01IE	Buy	REC	115.00	140000.00	16100000.00

Section C - Charges and Taxes Details

Portfolio ID	Buy/Sell	Symbol	Exchange Fees (Rs.)	Discount on Exchange Fees (Rs.)	Rebate on Exchange Fees (Rs.)	Net Exchange Fees (Rs.)	IGST/UTGST on Exchange Fees (Rs.)	SGST on Exchange Fees (Rs.)	CGST on Exchange Fees (Rs.)	GST on Trade (Rs.)	TCS (Rs.)	TDS (Rs.)	Charges & Taxes Total
W2MH0BST0001	Buy	REC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2898000.00	0.00	0.00	2898000.00

** This is a computer generated report*

EC Trade Report (Buy/Sell)

Date: 28-Aug-24

Trade Date	28-Aug-24
Participant ID	W2MH0BST0000
Participant Name	Brihanmumbai Electric Supply & Transport (BEST)
Portfolio ID	W2MH0BST0001
Portfolio Name	BEST Undertaking
State	Maharashtra
Registration Number	MH0MBESTWR01IE
Financial Year	2024-25

Trade Obligation(Rs.)	16100000.00
Net Exchange Fees	0.00
Exchange Fees IGST/UTGST	0.00
Exchange Fees SGST	0.00
Exchange Fees CGST	0.00
GST On Buy Trade	2898000.00
GST On Sell Trade	0.00
TCS Amount	0.00
TDS Amount	0.00
Funds Pay-In	18998000.00
Funds Pay-Out	0.00

Section A - Total (B+C)

Certificate Number	Certificate for Financial Year	Symbol	Invoice (Rs.)	Charges & Taxes (Rs.)	Pay-In Amount (Rs.)	Pay-Out Amount (Rs.)
C-IEX_REC000342	1048600	REC	16100000.00	2898000.00	18998000.00	0.00

Section B - Trade Details

Certificate Number	Certificate for Financial Year	Buy/Sell	Symbol	Rate (Rs.)	Quantity	Invoice (Rs.)
C-IEX_REC000342	1048600	Buy	REC	115.00	140000.00	16100000.00

Section C - Charges and Taxes Details

Certificate Number	Buy/Sell	Symbol	Exchange Fees (Rs.)	Discount on Exchange Fees (Rs.)	Rebate on Exchange Fees (Rs.)	Net Exchange Fees (Rs.)	IGST/UTGST on Exchange Fees (Rs.)	SGST on Exchange Fees (Rs.)	CGST on Exchange Fees (Rs.)	GST on Trade (Rs.)	TCS (Rs.)	TDS (Rs.)	Charges & Taxes Total
C-IEX_REC000342	Buy	REC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2898000.00	0.00	0.00	2898000.00

** This is a computer generated report*

Certificate of Purchase of Renewable Energy Certificate

INDIAN ENERGY EXCHANGE LTD.

Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000342 **Issued On: 28-Aug-2024**

BEST Undertaking

Number of Certificates: 140000

This certifies that BEST Undertaking is the holder of 140000 non transferable Renewable energy certificate(s) bought on 28-Aug-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

This is a computer-generated statement hence doesn't require signature.

POWER EXCHANGE INDIA LIMITED

Certificate of Purchase of REC(s)

Number C - PXMB08241568 **Issued On - 28-AUG-2024**

Serial No. - PXI/ 28082024/REC/01568

Number of Certificates - 140000

This certifies that BEST is the holder of 140000 non transferable Renewable Energy Certificate(s) bought on 28-AUG-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

Regd. Office: Power Exchange India Ltd.9th Floor, 901 ,Sumer Plaza,Marol Maroshi Road,Marol Andheri (East),Mumbai 400 059, India.

CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in

Note: - This is a computer generated statement hence doesn't require signature.

Auction date: 28-Aug-2024

REC Obligation Report Without GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price(Rs. / Certificate)	Trade Value (Rs.)	Regulatory Fees (Rs.)	Exchange Transaction Charges				Tax Collection at Source (TCS)			Tax Deduction at Source (TDS)			Net Obligation (Rs.)
									Transaction Charges (Rs.)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	CGST (Rs)	SGST (Rs)	IGST (Rs)	
S1020	S1020	NA	MH0MBESTWR01PE	REC	140000	115.00	16100000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16100000.00
	Total						16100000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16100000.00
Total							16100000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16100000.00
Net Obligation							16100000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16100000.00

REC Obligation Report With GST

Clearing Member ID	Trading Member ID	AM ID	CA Client ID	REC Type	Certificates Traded	Clearing Price (Rs. / Certificate)	Trade Value (Rs.)	GST on Trade Value (Rs)			Total GST on Trade Value (Rs)	Net Obligation without GST on Trade Value(Rs.)	Net Obligation with GST on Trade Value (Rs)
								CGST (Rs)	SGST (Rs)	IGST (Rs)	A	B (Please refer above table)	(A+B)
S1020	S1020	NA	MH0MBESTWR01PE	REC	140000	115.00	16100000.00	0.00	0.00	2898000.00	2898000.00	16100000.00	18998000.00
	Total						16100000.00	0.00	0.00	2898000.00	2898000.00	16100000.00	18998000.00
Total							16100000.00	0.00	0.00	2898000.00	2898000.00	16100000.00	18998000.00
Net Obligation							16100000.00	0.00	0.00	2898000.00	2898000.00	16100000.00	18998000.00

Note 1:- Tax Collection at Source (TCS) is as per Ministry of Finance, Government of India, (Department of Revenue), Central Board of Indirect Taxes and Customs notification no 51/2018 - Central Tax dt. 13 September 2018. This is a system generated report and does not require signature.

Note 2:- Tax Deduction at Source (TDS) is applicable based on Ministry of Finance, Government of India ,(Department of Revenue), Central Board of Indirect Taxes and Customs vide their notification no 50/2018 - Central tax dated 13 September 2018. This is a system generated report and does not require signature.

DISCOM- Annexure I

	GROSS ENERGY CONSUMPTION (YEAR 2024 - 2025)			
	Reporting Quarter - I			
	Utility : BEST Undertaking.			
1	**GROSS CONSUMPTION**		**Quantum (MUs)**	**Remarks**
O	**Own Generation**			
	Source 1		0	BEST not having own generation
	Source 2		0	
	…………			
	Source N		0	
	Sub Total (1)		0	
P	**Purchase from Other generating Company / Intermediaries**			
	TATA Power Co. (G) & Manikaran Power Ltd.		1454.173198	
	Source 2		0	
	…………		0	
	Source N		0	
	Sub Total (2)		**1454.173198**	
S	**Sale to Other Licensee / intermediaries**			
	Licensee 1		0	
	Licensee 2		0	
	……………		0	
	Inter.1		0	
	Sub Total (3)		0	
	Total GEC for the Quarter - (O+P-S)		**1454.173198**	
2	**RPO Obligation (29.91% of GEC)**		**434.943204**	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

30/9/2024

Divisional Engineer
Power Purchase Dept.
Sign and Seal of
authorized signatory of Company

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Sign and Seal of C.A.

RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(A-Wind)				
Reporting Quarter - I				
Month:	April 2024 to June 2024			
Eligible Person Name : BEST Undertaking.				
1	Own Generation		Quantum (MUs.)	Remarks
	RE 1		0	BEST not having own RE generation
	RE 2		0	
	…………			
	RE...N			
	Sub Total (1)		0	
2	Purchase from Other RE Sources / Licensee			
	Source 1		0	
	Source 2		0	
	………		0	
	…………		0	
	Source N		0	
	Sub Total (2)		0	
3	Purchase through REC		0	
	Sub Total (3)		0	
4	RE Sold to other Person			
	Party - 1		0	
	Party - 2		0	
	………..		0	
	Sub Total (4)		0	
	Total Procurement (1)+(2)+(3)-(4)		0	

Declaration: **We hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.**

30/10/2024

Divisional Engineer
Power Purchase Dept.
Sign and Seal of
authorized signatory of Company

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Sign and Seal of C.A.

DISCOM- Annexure III

RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(B-HPO)				
Reporting Quarter - I				
Month:	April 2024 to June 2024			
Eligible Person Name : BEST Undertaking.				
1	Own Generation		Quantum (MUs.)	Remarks
	RE 1		0	BEST not having own RE generation
	RE 2		0	
	…………			
	RE...N			
	Sub Total (1)		0	
2	Purchase from Other RE Sources / Licensee			
	Source 1		0	
	Source 2		0	
	………			
	………….			
	Source N			
	Sub Total (2)		0	
3	Purchase through REC		0	
	Sub Total (3)		0	
4	RE Sold to other Person			
	Party - 1		0	
	Party - 2		0	
	………..			
	Sub Total (4)		0	
	Total Procurement (1)+(2)+(3)-(4)		0	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

30/10/2024

Divisional Engineer
Power Purchase Dept.

Sign and Seal of
authorized signatory of Company

Sign and Seal of C.A.

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

DISCOM- Annexure IV

RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(C-Distributed RE)				
Reporting Quarter - I				
Month:	April 2024 to June 2024			
Eligible Person Name : BEST Undertaking.				
1	**Own Generation**		**Quantum (MUs.)**	**Remarks**
	RE 1		0	
	RE 2		0	BEST not having own RE generation
	…………		0	
	RE...N		0	
	Sub Total (1)		**0**	
2	**Purchase from Other RE Sources / Licensee**			
	Solar Generation of Net metered consumers		4.156737	
	Source 2		0	
	………		0	
	………….		0	
	Source N		0	
	Sub Total (2)		**4.156737**	
3	**Purchase through REC**		0	
	Sub Total (3)		**0**	
4	**RE Sold to other Person**			
	Party - 1		0	
	Party - 2		0	
	………..		0	
	Sub Total (4)		**0**	
	Total Procurement (1)+(2)+(3)-(4)		**4.156737**	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our

30/10/2024

Divisional Engineer
Power Purchase Dept.

Sign and Seal of
authorized signatory of Company

Sign and Seal of C.A.

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

DISCOM- Annexure V

RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(D-Other)				
Reporting Quarter - I				
Month:	April 2024 to June 2024			
Eligible Person Name : BEST Undertaking.				
1	**Own Generation**		**Quantum (MUs.)**	**Remarks**
	RE 1		0	BEST not having own RE generation
	RE 2		0	
	…………		0	
	RE...N		0	
	Sub Total (1)		**0**	
2	**Purchase from Other RE Sources / Licensee**			
	Walwhan Solar MH Ltd		8.122835	
	Solar Energy from Power Exchange IEX		81.60513	
	Non Solar Energy from Power Exchange IEX		16.60437	
	Hydro Energy from Power Exchange IEX		0.9698	
	Hydro Energy from Power Exchange from TPC G		229.943616	
	Sub Total (2)		**337.245751**	
3	**Purchase through REC**		0	
	Sub Total (3)		**0**	
4	**RE Sold to other Person**			
	Party - 1			
	Party - 2			
	………..		0	
	Sub Total (4)		**0**	
	Total Procurement (1)+(2)+(3)-(4)		**337.245751**	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

30/10/2024

Divisional Engineer
Power Purchase Dept.

Sign and Seal of
authorized signatory of Company

Sign and Seal of C.A.

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

RPO Settlement Account (Yearly) - YEAR 2024-25											
A - Wind											
Name : Eligible Person - BEST Undertaking.											
Gross Energy		RPO % Obligation (0.67 %)	RPO % Up to Previous month	RPO% Cumulative upto the month	RE purchase for the month		RE purchase up to previous Month		RE cumulative upto the month		Short if any
Consumption				-1					-2		(1-2)
MUs.		MUs.	MUs.	MUs.	MUs.		MUs.		MUs.		MUs.
Fiscal Year (2024-25)					Preferential Tariff	REC	Preferential Tariff	REC	Preferential Tariff	REC	
April	461.418943	3.0915069	0.00	3.091507	0	0	0	0	0	0	3.091507
May	512.303484	3.4324333	3.091507	6.523940	0	0	0	0	0	0	6.523940
June	480.450772	3.2190202	6.523940	9.742960	0	0	0	0	0	0	9.742960
July											
August											
September											
October											
November											
December											
January											
February											
March											
Total	**1454.173198**	**9.742960**			**0**	**0**					**9.742960**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

30/10/2024

Divisional Engineer
Power Purchase Dept.

Sign and Seal of
authorized signatory of Company

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Sign and Seal of C.A.

DISCOM- Annexure VII

RPO Settlement Account (Yearly) - YEAR 2024-25											
B-HPO											
Name : Eligible Person - BEST Undertaking											
	Gross Energy	RPO % Obligation (0.38 %)	RPO % Up to Previous month	RPO% Cumulative upto the month	RE purchase for the month		RE purchase up to previous Month		RE cumulative upto the month		Short if any
	Consumption			-1					-2		(1-2)
	MUs.	MUs.	MUs.	MUs.	MUs.		MUs.		MUs.		MUs.
Fiscal Year (2024-25)					Preferential Tariff	REC	Preferential Tariff	REC	Preferential Tariff	REC	
April	461.418943	1.753392	0.00	1.753392	0	0	0	0	0	0	1.753392
May	512.303484	1.946753	1.753392	3.700145	0	0	0	0	0	0	3.700145
June	480.450772	1.825713	3.700145	5.525858	0	0	0	0	0	0	5.525858
July											
August											
September											
October											
November											
December											
January											
February											
March											
Total	**1454.173198**	**5.525858**			**0**	**0**					**5.525858**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

Divisional Engineer
Power Purchase Dept.
Sign and Seal of
authorized signatory of Company

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Sign and Seal of C.A.

DISCOM- Annexure VIII

RPO Settlement Account (Yearly) - YEAR 2024-25

C – Distributed RE

Name : Eligible Person - BEST Undertaking

Gross Energy Consumption MUs.		RPO % Obligation (1.50 %) MUs.	RPO % Up to Previous month MUs.	RPO% Cumulative upto the month -1 MUs.	RE purchase for the month MUs.		RE purchase up to previous Month MUs.		RE cumulative upto the month -2 MUs.		Short if any (1-2) MUs.
Fiscal Year (2024-25)					Preferential Tariff	REC	Preferential Tariff	REC	Preferential Tariff	REC	
April	461.4189427	6.921284	0.000000	6.921284	1.406313	0	0	0	1.406313	0	5.514971
May	512.3034838	7.684552	6.921284	14.605836	1.571223	0	1.406313	0	2.977536	0	11.628300
June	480.4507716	7.206762	14.605836	21.812598	1.179201	0	1.571223	0	4.156737	0	17.655861
July											
August											
September											
October											
November											
December											
January											
February											
March											
Total	**1454.173198**	**21.812598**			**4.156737**	**0**					**17.655861**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

Divisional Engineer
Power Purchase Dept.
Sign and Seal of
authorized signatory of Company

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Sign and Seal of C.A.

DISCOM- Annexure IX

RPO Settlement Account (Yearly) - YEAR 2024-25											
D- Other RE											
Name : Eligible Person - BEST Undertaking											
Gross Energy		RPO % Obligation (27.35 %)	RPO % Up to Previous month	RPO% Cumulative upto the month	RE purchase for the month		RE purchase up to previous Month		RE cumulative upto the month		Short if any
Consumption				-1					-2		(1-2)
MUs.		MUs.	MUs.	MUs.	MUs.		MUs.		MUs.		MUs.
Fiscal Year (2024-25)					Preferential Tariff	REC	Preferential Tariff	REC	Preferential Tariff	REC	
April	461.4189427	126.198081	0.00	126.198081	96.9194313	0	0	0	96.919431	0	29.278649
May	512.3034838	140.115003	126.198081	266.313084	129.358563	0	96.919431	0	226.277994	0	40.035089
June	480.4507716	131.403286	266.313084	397.716370	110.967756	0	129.358563	0	337.245751	0	60.470619
July											
August											
September											
October											
November											
December											
January											
February											
March											
Total	**1454.173198**	**397.71637**			**337.245751**	**0**					**60.470619**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network

31/10/2024

Divisional Engineer
Power Purchase Dept.

Sign and Seal of
authorized signatory of Company

B. E. S. & T. Undertaking
बेस्ट
Power Purchase Dept.

Sign and Seal of C.A.

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : April-2024 **Issued on :** 01/05/2024
Portfolio Name: **BEST**

This is certified that BEST has purchased 19905.67 MWh (at regional periphery) of Renewable Energy for the period 01/04/2024 to 30/04/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
17753.51	1951.31	200.85	19905.67

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
Sr VP Market Operations

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Apr-24	838.96	98.19	26.32	963.47
02-Apr-24	1208.9	110.22	28.12	1347.24
03-Apr-24	1642.39	177.64	25.21	1845.24
04-Apr-24	1354.31	98.74	15.95	1469
05-Apr-24	786.35	40.69	16.24	843.28
06-Apr-24	529.27	26.6	8.63	564.5
07-Apr-24	33.26	3.33	2.41	39
08-Apr-24	802.98	57.02	0	860
09-Apr-24	306.9	25.6	0	332.5
10-Apr-24	994.04	141.5	0	1135.54
11-Apr-24	451.31	66.71	0	518.02
12-Apr-24	905.41	97.23	0	1002.64
13-Apr-24	383.29	47.36	0	430.65
14-Apr-24	29.23	12.93	0.78	42.94
15-Apr-24	529.67	51.69	0	581.36
16-Apr-24	656.41	74.33	2.29	733.03
17-Apr-24	186.04	14.96	0	201
18-Apr-24	449.51	41.99	0	491.5
19-Apr-24	548.85	87.77	0	636.62
20-Apr-24	394.5	45.32	4.18	444
21-Apr-24	110.32	7.76	2.17	120.25
22-Apr-24	418.61	36.99	8.46	464.06
23-Apr-24	899.1	126.54	14.44	1040.08
24-Apr-24	737.68	89.92	3.4	831
25-Apr-24	696.92	106.65	16.09	819.66
26-Apr-24	574.93	96.6	22.5	694.03
27-Apr-24	705.12	88.39	1.24	794.75
28-Apr-24	25.12	7.88	1.31	34.31
29-Apr-24	335.71	47.43	1.11	384.25

*Computer generated report signature not required.

B.E.S. & T. Undertaking * Power Purchase Dept. * बेस्ट

INDIAN ENERGY EXCHANGE

30-Apr-24	218.42	23.33	0	241.75
Grand Total				19905.67

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Apr-24	807.41	94.5	25.34	927.25
02-Apr-24	1163.48	106.07	27.07	1296.62
03-Apr-24	1580.66	170.95	24.27	1775.88
04-Apr-24	1303.4	95.02	15.35	1413.77
05-Apr-24	756.81	39.16	15.62	811.59
06-Apr-24	509.37	25.6	8.31	543.28
07-Apr-24	32.01	3.2	2.32	37.53
08-Apr-24	774.34	54.97	0	829.31
09-Apr-24	295.95	24.68	0	320.63
10-Apr-24	958.56	136.44	0	1095
11-Apr-24	435.23	64.31	0	499.54
12-Apr-24	873.09	93.76	0	966.85
13-Apr-24	369.63	45.67	0	415.3
14-Apr-24	28.19	12.47	0.75	41.41
15-Apr-24	511.51	49.91	0	561.42
16-Apr-24	633.89	71.79	2.2	707.88
17-Apr-24	179.67	14.44	0	194.11
18-Apr-24	434.1	40.55	0	474.65
19-Apr-24	530.01	84.76	0	614.77
20-Apr-24	380.96	43.76	4.05	428.77
21-Apr-24	106.53	7.49	2.09	116.11
22-Apr-24	403.83	35.69	8.16	447.68
23-Apr-24	867.37	122.07	13.93	1003.37
24-Apr-24	711.65	86.75	3.28	801.68
25-Apr-24	672.31	102.88	15.53	790.72
26-Apr-24	554.63	93.2	21.7	669.53
27-Apr-24	680.23	85.27	1.2	766.7
28-Apr-24	24.24	7.59	1.27	33.1
29-Apr-24	324.68	45.87	1.07	371.62
30-Apr-24	211.23	22.57	0	233.8
Grand Total				19189.87

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Apr-24	781.74	91.49	24.53	897.76
02-Apr-24	1126.48	102.71	26.19	1255.38
03-Apr-24	1530.38	165.52	23.51	1719.41
04-Apr-24	1261.95	92	14.86	1368.81

*Computer generated report signature not required.

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

IEX INDIAN ENERGY EXCHANGE

05-Apr-24	732.74	37.91	15.13	785.78
06-Apr-24	493.17	24.78	8.05	526
07-Apr-24	30.99	3.1	2.25	36.34
08-Apr-24	749.7	53.23	0	802.93
09-Apr-24	286.54	23.9	0	310.44
10-Apr-24	928.07	132.11	0	1060.18
11-Apr-24	421.39	62.26	0	483.65
12-Apr-24	845.34	90.77	0	936.11
13-Apr-24	357.88	44.21	0	402.09
14-Apr-24	27.29	12.08	0.72	40.09
15-Apr-24	495.23	48.33	0	543.56
16-Apr-24	613.73	69.5	2.14	685.37
17-Apr-24	173.94	13.98	0	187.92
18-Apr-24	420.3	39.26	0	459.56
19-Apr-24	513.16	82.07	0	595.23
20-Apr-24	368.85	42.37	3.92	415.14
21-Apr-24	103.15	7.25	2.03	112.43
22-Apr-24	390.98	34.55	7.9	433.43
23-Apr-24	839.8	118.18	13.5	971.48
24-Apr-24	689.02	83.99	3.18	776.19
25-Apr-24	650.94	99.6	15.03	765.57
26-Apr-24	536.99	90.24	21.01	648.24
27-Apr-24	658.62	82.56	1.15	742.33
28-Apr-24	23.47	7.36	1.22	32.05
29-Apr-24	314.35	44.41	1.04	359.8
30-Apr-24	204.51	21.85	0	226.36
Grand Total				18579.63

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Apr-24	781.74	91.49	24.53	897.76
02-Apr-24	1126.48	102.71	26.19	1255.38
03-Apr-24	1530.38	165.52	23.51	1719.41
04-Apr-24	1261.95	92	14.86	1368.81
05-Apr-24	732.74	37.91	15.13	785.78
06-Apr-24	493.17	24.78	8.05	526
07-Apr-24	30.99	3.1	2.25	36.34
08-Apr-24	749.7	53.23	0	802.93
09-Apr-24	286.54	23.9	0	310.44
10-Apr-24	928.07	132.11	0	1060.18
11-Apr-24	421.39	62.26	0	483.65
12-Apr-24	845.34	90.77	0	936.11
13-Apr-24	357.88	44.21	0	402.09

*Computer generated report signature not required.

B. E. S. & T. Undertaking * Power Purchase Dept. * बेस्ट

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : May-2024 **Issued on :** 01/06/2024

Portfolio Name: **BEST**

This is certified that BEST has purchased 49339.07 MWh (at regional periphery) of Renewable Energy for the period 01/05/2024 to 31/05/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
40169	8656.88	513.19	49339.07

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
ED Market Operations

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-May-24	95.22	44.01	0.82	140.05
03-May-24	646.6	74.74	0.3	721.64
04-May-24	350.3	121.16	2.28	473.74
05-May-24	92.8	30.98	1.72	125.5
06-May-24	515.9	80.8	0.3	597
07-May-24	1739.49	129.45	0.28	1869.22
08-May-24	1477.68	238.75	0.69	1717.12
09-May-24	1990.8	279.36	1.85	2272.01
10-May-24	2091.61	391.34	8.68	2491.63
11-May-24	1408.99	316.29	28.22	1753.5
12-May-24	369.83	105.68	29.74	505.25
13-May-24	1745.47	155.4	39.18	1940.05
14-May-24	1688.55	183.1	7.08	1878.73
15-May-24	1659.23	149.24	3.55	1812.02
16-May-24	1581.47	244.15	6.67	1832.29
17-May-24	1977.59	154.08	3.58	2135.25
18-May-24	1382.25	157.75	12.25	1552.25
19-May-24	794.4	272.36	49.92	1116.68
20-May-24	527.62	70.37	21.13	619.12
21-May-24	1391.15	233.88	70.16	1695.19
22-May-24	2096.48	290.64	84.15	2471.27
23-May-24	1952.57	256.99	6.52	2216.08
24-May-24	2260.1	255.62	17.5	2533.22
25-May-24	2019.87	417.08	6.27	2443.22
26-May-24	819.2	612.66	5.89	1437.75
27-May-24	1951.25	906.65	55.58	2913.48
28-May-24	1339.13	1075.48	9.39	2424
29-May-24	1972.56	714.92	21.08	2708.56
30-May-24	2230.89	693.95	18.41	2943.25

*Computer generated report signature not required.

B.E.S. & T. Undertaking बेस्ट Power Purchase Dept.

INDIAN ENERGY EXCHANGE

Grand Total	49339.07

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-May-24	92.09	42.56	0.79	135.44
03-May-24	625.32	72.27	0.29	697.88
04-May-24	338.76	117.17	2.21	458.14
05-May-24	89.75	29.96	1.66	121.37
06-May-24	499.06	78.16	0.3	577.52
07-May-24	1682.77	125.23	0.27	1808.27
08-May-24	1429.5	230.97	0.67	1661.14
09-May-24	1925.9	270.25	1.79	2197.94
10-May-24	2023.42	378.58	8.41	2410.41
11-May-24	1363.06	305.97	27.3	1696.33
12-May-24	357.78	102.23	28.76	488.77
13-May-24	1687.35	150.23	37.86	1875.44
14-May-24	1632.32	177	6.86	1816.18
15-May-24	1603.99	144.28	3.43	1751.7
16-May-24	1528.79	236.02	6.45	1771.26
17-May-24	1911.76	148.94	3.46	2064.16
18-May-24	1336.22	152.5	11.85	1500.57
19-May-24	767.95	263.29	48.27	1079.51
20-May-24	509.33	67.92	20.4	597.65
21-May-24	1342.88	225.75	67.72	1636.35
22-May-24	2023.74	280.55	81.23	2385.52
23-May-24	1884.82	248.07	6.29	2139.18
24-May-24	2181.69	246.76	16.89	2445.34
25-May-24	1949.76	402.59	6.05	2358.4
26-May-24	790.78	591.41	5.68	1387.87
27-May-24	1885.7	876.19	53.7	2815.59
28-May-24	1294.14	1039.33	9.07	2342.54
29-May-24	1906.27	690.91	20.37	2617.55
30-May-24	2155.93	670.63	17.8	2844.36
Grand Total				47682.38

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-May-24	89.15	41.21	0.77	131.13
03-May-24	605.43	69.98	0.28	675.69
04-May-24	327.99	113.44	2.13	443.56
05-May-24	86.89	29.01	1.61	117.51
06-May-24	483.19	75.67	0.28	559.14
07-May-24	1629.27	121.24	0.26	1750.77

B.E.S. & T. Undertaking बेस्ट Power Purchase Dept.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

08-May-24	1384.04	223.62	0.65	1608.31
09-May-24	1864.67	261.64	1.73	2128.04
10-May-24	1959.07	366.55	8.14	2333.76
11-May-24	1319.72	296.24	26.43	1642.39
12-May-24	346.39	98.98	27.84	473.21
13-May-24	1633.68	145.44	36.67	1815.79
14-May-24	1580.42	171.37	6.64	1758.43
15-May-24	1552.98	139.68	3.33	1695.99
16-May-24	1480.18	228.52	6.24	1714.94
17-May-24	1850.94	144.22	3.35	1998.51
18-May-24	1293.73	147.64	11.48	1452.85
19-May-24	743.53	254.9	46.74	1045.17
20-May-24	493.14	65.77	19.75	578.66
21-May-24	1300.18	218.57	65.56	1584.31
22-May-24	1959.37	271.63	78.65	2309.65
23-May-24	1824.89	240.18	6.09	2071.16
24-May-24	2112.31	238.91	16.36	2367.58
25-May-24	1887.76	389.78	5.86	2283.4
26-May-24	765.62	572.6	5.5	1343.72
27-May-24	1825.73	848.32	52.01	2726.06
28-May-24	1252.99	1006.28	8.79	2268.06
29-May-24	1845.65	668.94	19.72	2534.31
30-May-24	2087.38	649.3	17.23	2753.91
Grand Total				46166.01

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-May-24	89.15	41.21	0.77	131.13
03-May-24	605.43	69.98	0.28	675.69
04-May-24	327.99	113.44	2.13	443.56
05-May-24	86.89	29.01	1.61	117.51
06-May-24	483.19	75.67	0.28	559.14
07-May-24	1629.27	121.24	0.26	1750.77
08-May-24	1384.04	223.62	0.65	1608.31
09-May-24	1864.67	261.64	1.73	2128.04
10-May-24	1959.07	366.55	8.14	2333.76
11-May-24	1319.72	296.24	26.43	1642.39
12-May-24	346.39	98.98	27.84	473.21
13-May-24	1633.68	145.44	36.67	1815.79
14-May-24	1580.42	171.37	6.64	1758.43
15-May-24	1552.98	139.68	3.33	1695.99
16-May-24	1480.18	228.52	6.24	1714.94
17-May-24	1850.94	144.22	3.35	1998.51

*Computer generated report signature not required.

B.E.S. & T. Undertaking
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Power Purchase Dept.

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : June-2024 **Issued on :** 01/07/2024

Portfolio Name: **BEST**

This is certified that BEST has purchased 33460.36 MWh (at regional periphery) of Renewable Energy for the period 01/06/2024 to 30/06/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
26585.64	6584.29	290.43	33460.36

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
ED Market Operations

B. E. S. & T. Undertaking * Power Purchase Dept. *

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jun-24	1849.06	355.07	3.63	2207.76
02-Jun-24	660.03	253.2	6.45	919.68
03-Jun-24	1775.66	440.43	5.3	2221.39
04-Jun-24	2121.72	404	4.31	2530.03
05-Jun-24	1505.2	243.4	8.76	1757.36
06-Jun-24	1156.72	219.71	3.22	1379.65
07-Jun-24	1716.01	283.73	3.37	2003.11
08-Jun-24	856.34	251.5	6.62	1114.46
09-Jun-24	699.65	423.69	27.84	1151.18
10-Jun-24	929.03	358.96	11.41	1299.4
11-Jun-24	798.07	132.77	1.26	932.1
12-Jun-24	697.53	154.55	1.17	853.25
13-Jun-24	834.15	197.33	0.92	1032.4
14-Jun-24	919.14	289.22	3.51	1211.87
15-Jun-24	498.22	86.17	0.61	585
16-Jun-24	440.9	73.47	15.38	529.75
17-Jun-24	666.67	191.48	37.85	896
18-Jun-24	785.57	160.07	6.11	951.75
19-Jun-24	919.47	249.78	41.81	1211.06
20-Jun-24	482.88	112.43	16.94	612.25
21-Jun-24	579.5	175.69	29.04	784.23
22-Jun-24	938.01	167.74	16	1121.75
23-Jun-24	324.91	224.1	3.09	552.1
24-Jun-24	763.38	145.96	0.41	909.75
25-Jun-24	707.66	180.21	1.38	889.25
26-Jun-24	735.51	185.22	2.02	922.75
27-Jun-24	838.92	189.77	3.81	1032.5
28-Jun-24	753.15	191.78	6.65	951.58
29-Jun-24	409.02	106.49	4.99	520.5

*Computer generated report signature not required.

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30-Jun-24	223.56	136.37	16.57	376.5
Grand Total				33460.36

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jun-24	1786.92	343.12	3.51	2133.55
02-Jun-24	637.85	244.68	6.23	888.76
03-Jun-24	1714.94	425.37	5.11	2145.42
04-Jun-24	2049.15	390.19	4.16	2443.5
05-Jun-24	1453.74	235.07	8.46	1697.27
06-Jun-24	1117.16	212.2	3.11	1332.47
07-Jun-24	1657.32	274.02	3.26	1934.6
08-Jun-24	827.08	242.89	6.39	1076.36
09-Jun-24	675.72	409.2	26.89	1111.81
10-Jun-24	896.41	346.37	11.01	1253.79
11-Jun-24	770.06	128.11	1.22	899.39
12-Jun-24	673.06	149.13	1.12	823.31
13-Jun-24	804.88	190.41	0.88	996.17
14-Jun-24	886.88	279.07	3.39	1169.34
15-Jun-24	480.75	83.13	0.59	564.47
16-Jun-24	425.41	70.89	14.85	511.15
17-Jun-24	644	184.97	36.57	865.54
18-Jun-24	758.84	154.62	5.91	919.37
19-Jun-24	888.2	241.3	40.38	1169.88
20-Jun-24	466.46	108.61	16.37	591.44
21-Jun-24	559.78	169.72	28.05	757.55
22-Jun-24	906.13	162.03	15.46	1083.62
23-Jun-24	313.88	216.47	2.98	533.33
24-Jun-24	736.43	140.82	0.39	877.64
25-Jun-24	682.68	173.85	1.33	857.86
26-Jun-24	709.54	178.68	1.95	890.17
27-Jun-24	809.29	183.05	3.68	996.02
28-Jun-24	726.53	185	6.41	917.94
29-Jun-24	394.58	102.73	4.82	502.13
30-Jun-24	215.66	131.56	15.98	363.2
Grand Total				32307.05

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jun-24	1730.09	332.22	3.4	2065.71
02-Jun-24	617.56	236.9	6.03	860.49
03-Jun-24	1660.4	411.84	4.95	2077.19
04-Jun-24	1984	377.77	4.03	2365.8

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INDIAN ENERGY EXCHANGE

05-Jun-24	1407.51	227.59	8.2	1643.3
06-Jun-24	1081.64	205.45	3.02	1290.11
07-Jun-24	1604.63	265.3	3.15	1873.08
08-Jun-24	800.76	235.18	6.19	1042.13
09-Jun-24	654.22	396.2	26.03	1076.45
10-Jun-24	867.91	335.35	10.66	1213.92
11-Jun-24	745.57	124.04	1.18	870.79
12-Jun-24	651.66	144.38	1.09	797.13
13-Jun-24	779.28	184.35	0.86	964.49
14-Jun-24	858.69	270.2	3.27	1132.16
15-Jun-24	465.46	80.49	0.57	546.52
16-Jun-24	411.9	68.63	14.37	494.9
17-Jun-24	623.52	179.08	35.4	838
18-Jun-24	734.71	149.71	5.72	890.14
19-Jun-24	859.96	233.61	39.11	1132.68
20-Jun-24	451.64	105.15	15.84	572.63
21-Jun-24	541.98	164.32	27.16	733.46
22-Jun-24	877.3	156.89	14.97	1049.16
23-Jun-24	303.89	209.58	2.89	516.36
24-Jun-24	713.02	136.33	0.38	849.73
25-Jun-24	660.96	168.31	1.3	830.57
26-Jun-24	686.98	173	1.88	861.86
27-Jun-24	783.55	177.24	3.56	964.35
28-Jun-24	703.42	179.12	6.2	888.74
29-Jun-24	382.04	99.45	4.67	486.16
30-Jun-24	208.8	127.37	15.48	351.65
Grand Total				31279.66

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jun-24	1730.09	332.22	3.4	2065.71
02-Jun-24	617.56	236.9	6.03	860.49
03-Jun-24	1660.4	411.84	4.95	2077.19
04-Jun-24	1984	377.77	4.03	2365.8
05-Jun-24	1407.51	227.59	8.2	1643.3
06-Jun-24	1081.64	205.45	3.02	1290.11
07-Jun-24	1604.63	265.3	3.15	1873.08
08-Jun-24	800.76	235.18	6.19	1042.13
09-Jun-24	654.22	396.2	26.03	1076.45
10-Jun-24	867.91	335.35	10.66	1213.92
11-Jun-24	745.57	124.04	1.18	870.79
12-Jun-24	651.66	144.38	1.09	797.13
13-Jun-24	779.28	184.35	0.86	964.49

*Computer generated report signature not required.

B. E. S. & T. Undertaking * Power Purchase Dept. *

DISCOM- Annexure I

GROSS ENERGY CONSUMPTION (YEAR 2024 - 2025)				
	Reporting Quarter - II			
	Utility : BEST Undertaking.			
1	**GROSS CONSUMPTION**		**Quantum (MUs)**	**Remarks**
O	**Own Generation**			
	Source 1		0	BEST not having own generation
	Source 2		0	
	…………			
	Source N		0	
	Sub Total (1)		0	
P	**Purchase from Other generating Company / Intermediaries**			
	TATA Power Co. (G) & Manikaran Power Ltd.		1321.149519	
	Source 2		0	
	…………		0	
	Source N		0	
	Sub Total (2)		**1321.149519**	
S	**Sale to Other Licensee / intermediaries**			
	Licensee 1		0	
	Licensee 2		0	
	……………		0	
	Inter.1		0	
	Sub Total (3)		0	
	Total GEC for the Quarter - (O+P-S)		**1321.149519**	
2	**RPO Obligation (29.91% of GEC)**		**395.155821**	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

30/11/2024

Divisional Engineer
Power Purchase Dept.
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RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(A-Wind)				
Reporting Quarter - II				
Month:	**July 2024 to September 2024**			
Eligible Person Name : BEST Undertaking.				
1	**Own Generation**		**Quantum (MUs.)**	**Remarks**
	RE 1		0	BEST not having own RE generation
	RE 2		0	
	…………		0	
	RE...N		0	
	Sub Total (1)		**0**	
2	**Purchase from Other RE Sources / Licensee**			
	Source 1		0	
	Source 2		0	
	………		0	
	………….		0	
	Source N		0	
	Sub Total (2)		**0**	
3	**Purchase through REC**		**0**	
	Sub Total (3)		**0**	
4	RE Sold to other Person		0	
	Party - 1		0	
	Party - 2		0	
	………..		0	
	Sub Total (4)		**0**	
	Total Procurement (1)+(2)+(3)-(4)		**0**	

Declaration: We hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

Divisional Engineer
Power Purchase Dept.

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authorized signatory of Company

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DISCOM- Annexure III

RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(B-HPO)				
Reporting Quarter - II				
Month:	**July 2024 to September 2024**			
Eligible Person Name : BEST Undertaking.				
1	**Own Generation**		**Quantum (MUs.)**	**Remarks**
	RE 1		0	BEST not having own RE generation
	RE 2		0	
	…………		0	
	RE...N		0	
	Sub Total (1)		**0**	
2	**Purchase from Other RE Sources / Licensee**			
	Source 1		0	
	Source 2		0	
	………		0	
	………….		0	
	Source N		0	
	Sub Total (2)		**0**	
3	**Purchase through REC**		0	
	Sub Total (3)		**0**	
4	**RE Sold to other Person**			
	Party - 1		0	
	Party - 2		0	
	……….		0	
	Sub Total (4)		**0**	
	Total Procurement (1)+(2)+(3)-(4)		**0**	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

3/10/2024

Divisional Engineer
Power Purchase Dept.

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Sign and Seal of C.A.

B.E.S. & T. Undertaking
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Power Purchase Dept.

DISCOM- Annexure IV

RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(C-Distributed RE)				
Reporting Quarter - II				
Month:	**July 2024 to September 2024**			
Eligible Person Name : BEST Undertaking.				
1	**Own Generation**		**Quantum (MUs.)**	**Remarks**
	RE 1		0	
	RE 2		0	BEST not having own RE generation
	…………		0	
	RE...N		0	
	Sub Total (1)		0	
2	**Purchase from Other RE Sources / Licensee**			
	Solar Generation of Net metered consumers		2.960365	
	Source 2		0	
	………		0	
	………….		0	
	Source N		0	
	Sub Total (2)		**2.960365**	
3	**Purchase through REC**		0	
	Sub Total (3)		**0**	
4	**RE Sold to other Person**			
	Party - 1		0	
	Party - 2		0	
	………..			
	Sub Total (4)		0	
	Total Procurement (1)+(2)+(3)-(4)		**2.960365**	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our

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Power Purchase Dept.

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DISCOM- Annexure V

RENEWABLE ENERGY PROCUREMENT (YEAR 2024-25)				
(D-Other)				
Reporting Quarter - II				
Month:	**July 2024 to September 2024**			
Eligible Person Name : BEST Undertaking.				
1	**Own Generation**		**Quantum (MUs.)**	**Remarks**
	RE 1		0	BEST not having own RE generation
	RE 2			
	…………			
	RE...N			
	Sub Total (1)		**0**	
2	**Purchase from Other RE Sources / Licensee**			
	Walwhan Solar MH Ltd		6.085122	
	Solar Energy from Power Exchange IEX		48.72432	
	Non Solar Energy from Power Exchange IEX		28.56561	
	Hydro Energy from Power Exchange IEX		4.65347	
	Hydro Energy Power from TPC G		252.101734	
	Sub Total (2)		**340.130256**	
3	**Purchase through REC**		2095.20	REC purchased to fulfill the cumulative shortfall of FY 2022-23 and FY 2023-24
	Sub Total (3)		**2095.20**	
4	**RE Sold to other Person**			
	Party - 1		0	
	Party - 2		0	
	………..		0	
	Sub Total (4)		**0**	
	Total Procurement (1)+(2)+(3)-(4)		**2435.330256**	

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on

30/10/2024

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DISCOM- Annexure VI

RPO Settlement Account (Yearly) - YEAR 2024-25												
A - Wind												
Name : Eligible Person - BEST Undertaking.												
Gross Energy		RPO % Obligation (0.67 %)	RPO % Up to Previous month	RPO% Cumulative upto the month	RE purchase for the month		RE purchase up to previous Month		RE cumulative upto the month		Short if any
Consumption				-1					-2		(1-2)
MUs.		MUs.	MUs.	MUs.	MUs.		MUs.		MUs.		MUs.
Fiscal Year (2024-25)					Preferential Tariff	REC	Preferential Tariff	REC	Preferential Tariff	REC	
April	461.418943	3.091507	0.000000	3.091507	0	0	0	0	0	0	3.091507
May	512.303484	3.432433	3.091507	6.523940	0	0	0	0	0	0	6.523940
June	480.450772	3.219020	6.523940	9.742960	0	0	0	0	0	0	9.742960
July	436.611694	2.925298	9.742960	12.668259	0	0	0	0	0	0	12.668259
August	449.155440	3.009341	12.668259	15.677600	0	0	0	0	0	0	15.677600
September	435.382386	2.917062	15.677600	18.594662	0	0	0	0	0	0	18.594662
October											
November											
December											
January											
February											
March											
Total	**2775.322717**	**18.594662**			**0**	**0**					**18.594662**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

3/10/2024

Divisional Engineer
Power Purchase Dept.

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B.E.S. & T. Undertaking
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RPO Settlement Account (Yearly) - YEAR 2024-25

B-HPO

Name : Eligible Person - BEST Undertaking

Gross Energy		RPO % Obligation (0.38 %)	RPO % Up to Previous month	RPO% Cumulative upto the month	RE purchase for the month		RE purchase up to previous Month		RE cumulative upto the month		Short if any
Consumption				-1					-2		(1-2)
MUs.		MUs.	MUs.	MUs.	MUs.		MUs.		MUs.		MUs.
Fiscal Year (2024-25)					Preferential Tariff	REC	Preferential Tariff	REC	Preferential Tariff	REC	
April	461.418943	1.753392	0.000000	1.753392	0	0	0	0	0	0	1.753392
May	512.303484	1.946753	1.753392	3.700145	0	0	0	0	0	0	3.700145
June	480.450772	1.825713	3.700145	5.525858	0	0	0	0	0	0	5.525858
July	436.611694	1.659124	5.525858	7.184983	0	0	0	0	0	0	7.184983
August	449.155440	1.706791	7.184983	8.891773	0	0	0	0	0	0	8.891773
September	435.382386	1.654453	8.891773	10.546226	0	0	0	0	0	0	10.546226
October											
November											
December											
January											
February											
March											
Total	**2775.322717**	**10.546226**			**0.00**	**0.00**					**10.546226**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

30/10/2024

Divisional Engineer
Power Purchase Dept.

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Power Purchase Dept.

Sign and Seal of C.A.

DISCOM- Annexure VIII

RPO Settlement Account (Yearly) - YEAR 2024-25

C – Distributed RE

Name : Eligible Person - BEST Undertaking

Gross Energy		RPO % Obligation (1.50 %)	RPO % Up to Previous month	RPO% Cumulative upto the month	RE purchase for the month		RE purchase up to previous Month		RE cumulative upto the month		Short if any
Consumption				-1					-2		(1-2)
MUs.		MUs.	MUs.	MUs.	MUs.		MUs.		MUs.		MUs.
Fiscal Year (2024-25)					Preferential Tariff	REC	Preferential Tariff	REC	Preferential Tariff	REC	
April	461.418943	6.921284	0.00	6.921284	1.406313	0	0	0	1.406313	0	5.514971
May	512.303484	7.684552	6.921284	14.605836	1.571223	0	1.406313	0	2.977536	0	11.628300
June	480.450772	7.206762	14.605836	21.812598	1.179201	0	1.571223	0	4.156737	0	17.655861
July	436.611694	6.549175	21.812598	28.361773	0.768239	0	1.179201	0	4.924976	0	23.436797
August	449.155440	6.737332	28.361773	35.099105	1.053844	0	0.768239	0	5.978820	0	29.120285
September	435.382386	6.530736	35.099105	41.629841	1.138282	0	1.053844	0	7.117102	0	34.512739
October											
November											
December											
January											
February											
March											
Total	**2775.322717**	**41.629841**			**7.117102**	**0**					**34.512739**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network.

30/10/2024

Divisional Engineer
Power Purchase Dept.

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बेस्ट
Power Purchase Dept.

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RPO Settlement Account (Yearly) - YEAR 2024-25											
D- Other RE											
Name : Eligible Person - BEST Undertaking											
Gross Energy		**RPO % Obligation (27.35 %)**	**RPO % Up to Previous month**	**RPO% Cumulative upto the month**	**RE purchase for the month**		**RE purchase up to previous Month**		**RE cumulative upto the month**		**Short if any**
Consumption				**-1**					**-2**		**(1-2)**
MUs.		**MUs.**	**MUs.**	**MUs.**	**MUs.**		**MUs.**		**MUs.**		**MUs.**
Fiscal Year (2024-25)					**Preferential Tariff**	**REC**	**Preferential Tariff**	**REC**	**Preferential Tariff**	**REC**	
April	461.418943	126.198081	0.000000	126.198081	96.919431	0.00	0.000000	0.00	96.919431	0.00	29.278649
May	512.303484	140.115003	126.198081	266.313084	129.358563	0.00	96.919431	0.00	226.277994	0.00	40.035089
June	480.450772	131.403286	266.313084	397.716370	110.967756	0.00	129.358563	0.00	337.245751	0.00	60.470619
July	436.611694	119.413298	397.716370	517.129668	105.061246	1182.50	110.967756	0.00	442.306997	1182.50	-1107.677329
August	449.155440	122.844013	517.129668	639.973681	120.504435	912.70	105.061246	1182.50	562.811432	2095.20	-2018.037751
September	435.382386	119.077083	639.973681	759.050763	114.564575	0.00	120.504435	912.70	677.376007	2095.20	-2013.525244
October											
November											
December											
January											
February											
March											
Total	**2775.322717**	**759.050763**			**677.376007**	**2095.20**					**-2013.525244**

Declaration: WE hereby declare that the gross energy consumption & R.E procurement data submitted above does not includes the gross energy consumption & R.E procurement data of CPP / OA consumers on our network

Divisional Engineer
Power Purchase Dept.

Sign and Seal of
authorized signatory of Company

B.E.S. & T. Undertaking
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Power Purchase Dept.

Sign and Seal of C.A.

INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : July-2024 **Issued on :** 01/08/2024
Portfolio Name: **BEST**

This is certified that BEST has purchased 24870.37 MWh (at regional periphery) of Renewable Energy for the period 01/07/2024 to 31/07/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
13819.52	10207.84	843.01	24870.37

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
ED Market Operations

B. E. S. & T. Undertaking ★ Power Purchase Dept. ★

*Computer generated report signature not required.

IEX
INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-24	630.3	700.34	61.58	1392.22
02-Jul-24	830.05	813.2	78.5	1721.75
03-Jul-24	917.97	608.35	68.51	1594.83
04-Jul-24	952.32	614.25	66.24	1632.81
05-Jul-24	1573.89	821.91	81.2	2477
06-Jul-24	613.95	690.27	21.58	1325.8
07-Jul-24	355.45	526.53	19.77	901.75
08-Jul-24	771.51	448.08	51.77	1271.36
09-Jul-24	665.78	263.31	45.4	974.49
10-Jul-24	647.1	193.48	37.02	877.6
11-Jul-24	376.89	157.95	32.09	566.93
12-Jul-24	265.96	112.15	11.17	389.28
15-Jul-24	357.6	140.13	18.81	516.54
16-Jul-24	399.93	245.97	21.45	667.35
18-Jul-24	388.01	153.9	20.34	562.25
19-Jul-24	337.11	146.07	3.06	486.24
20-Jul-24	136.36	98.42	0.22	235
22-Jul-24	150.97	307.34	11.19	469.5
23-Jul-24	123	359.96	6.54	489.5
24-Jul-24	194.11	246.04	11.85	452
25-Jul-24	273.7	276.47	19.33	569.5
26-Jul-24	196.25	293.95	14.44	504.64
27-Jul-24	172.48	110.56	7.01	290.05
29-Jul-24	1213.22	1301.34	74.62	2589.18
30-Jul-24	376.18	311.93	24.39	712.5
31-Jul-24	899.43	265.94	34.93	1200.3
Grand Total				24870.37

Scheduling details after applying ISTS (POC) loss

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-24	607.54	675.06	59.35	1341.95
02-Jul-24	800.08	783.83	75.68	1659.59
03-Jul-24	884.84	586.37	66.05	1537.26
04-Jul-24	917.94	592.08	63.84	1573.86
05-Jul-24	1517.07	792.25	78.26	2387.58
06-Jul-24	591.79	665.34	20.8	1277.93
07-Jul-24	342.63	507.49	19.07	869.19
08-Jul-24	743.2	431.62	49.87	1224.69
09-Jul-24	641.33	253.65	43.72	938.7
10-Jul-24	623.36	186.37	35.66	845.39
11-Jul-24	363.05	152.15	30.91	546.11
12-Jul-24	256.17	108.04	10.76	374.97
15-Jul-24	343.44	134.59	18.06	496.09
16-Jul-24	384.1	236.24	20.6	640.94
18-Jul-24	372.65	147.82	19.54	540.01
19-Jul-24	323.78	140.28	2.95	467.01
20-Jul-24	130.97	94.51	0.21	225.69
22-Jul-24	145.63	296.45	10.8	452.88
23-Jul-24	118.64	347.22	6.31	472.17
24-Jul-24	187.24	237.33	11.43	436
25-Jul-24	264	266.69	18.66	549.35
26-Jul-24	189.32	283.56	13.92	486.8
27-Jul-24	166.38	106.64	6.76	279.78
29-Jul-24	1168.57	1253.47	71.87	2493.91
30-Jul-24	362.36	300.44	23.5	686.3
31-Jul-24	866.34	256.16	33.64	1156.14
Grand Total				23960.29

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-24	588.22	653.59	57.47	1299.28
02-Jul-24	774.64	758.91	73.27	1606.82
03-Jul-24	856.69	567.72	63.95	1488.36
04-Jul-24	888.75	573.24	61.82	1523.81
05-Jul-24	1468.82	767.05	75.78	2311.65
06-Jul-24	572.96	644.19	20.14	1237.29
07-Jul-24	331.72	491.36	18.45	841.53
08-Jul-24	719.57	417.9	48.28	1185.75
09-Jul-24	620.94	245.57	42.34	908.85
10-Jul-24	603.54	180.44	34.52	818.5
11-Jul-24	351.51	147.31	29.92	528.74
12-Jul-24	248.03	104.6	10.42	363.05

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INDIAN ENERGY EXCHANGE

15-Jul-24	332.52	130.29	17.5	480.31
16-Jul-24	371.88	228.73	19.95	620.56
18-Jul-24	360.82	143.12	18.9	522.84
19-Jul-24	313.49	135.82	2.85	452.16
20-Jul-24	126.78	91.51	0.21	218.5
22-Jul-24	140.99	287.03	10.45	438.47
23-Jul-24	114.87	336.18	6.1	457.15
24-Jul-24	181.28	229.78	11.07	422.13
25-Jul-24	255.62	258.19	18.07	531.88
26-Jul-24	183.29	274.55	13.48	471.32
27-Jul-24	161.09	103.24	6.55	270.88
29-Jul-24	1131.41	1213.61	69.59	2414.61
30-Jul-24	350.84	290.89	22.74	664.47
31-Jul-24	838.79	248.01	32.58	1119.38
Grand Total				23198.29

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Jul-24	588.22	653.59	57.47	1299.28
02-Jul-24	774.64	758.91	73.27	1606.82
03-Jul-24	856.69	567.72	63.95	1488.36
04-Jul-24	888.75	573.24	61.82	1523.81
05-Jul-24	1468.82	767.05	75.78	2311.65
06-Jul-24	572.96	644.19	20.14	1237.29
07-Jul-24	331.72	491.36	18.45	841.53
08-Jul-24	719.57	417.9	48.28	1185.75
09-Jul-24	620.94	245.57	42.34	908.85
10-Jul-24	603.54	180.44	34.52	818.5
11-Jul-24	351.51	147.31	29.92	528.74
12-Jul-24	248.03	104.6	10.42	363.05
15-Jul-24	332.52	130.29	17.5	480.31
16-Jul-24	371.88	228.73	19.95	620.56
18-Jul-24	360.82	143.12	18.9	522.84
19-Jul-24	313.49	135.82	2.85	452.16
20-Jul-24	126.78	91.51	0.21	218.5
22-Jul-24	140.99	287.03	10.45	438.47
23-Jul-24	114.87	336.18	6.1	457.15
24-Jul-24	181.28	229.78	11.07	422.13
25-Jul-24	255.62	258.19	18.07	531.88
26-Jul-24	183.29	274.55	13.48	471.32
27-Jul-24	161.09	103.24	6.55	270.88
29-Jul-24	1131.41	1213.61	69.59	2414.61
30-Jul-24	350.84	290.89	22.74	664.47

*Computer generated report signature not required.

IEX
INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : August-2024 | Issued on : 01/09/2024

Portfolio Name: **BEST**

This is certified that BEST has purchased 26175.09 MWh (at regional periphery) of Renewable Energy for the period 01/08/2024 to 31/08/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
14179.46	10775.91	1219.72	26175.09

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
ED Market Operations

B.E.S. & T. Undertaking
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Power Purchase Dept.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-24	991.53	460.95	68.46	1520.94
02-Aug-24	1064.9	1238.12	48.66	2351.68
03-Aug-24	674.04	1272.1	41.38	1987.52
04-Aug-24	446.44	1733.53	106.01	2285.98
05-Aug-24	353.97	330.47	51.79	736.23
06-Aug-24	562.15	403.81	59.27	1025.23
07-Aug-24	710.12	462.68	80.2	1253
08-Aug-24	633.4	320.31	71.99	1025.7
09-Aug-24	471.57	215.66	29.06	716.29
10-Aug-24	146.25	87.27	17.98	251.5
12-Aug-24	417.65	416.51	81.38	915.54
13-Aug-24	439.36	262.59	42.05	744
14-Aug-24	756.09	231.55	28.7	1016.34
16-Aug-24	539.53	215	42.56	797.09
17-Aug-24	188.73	70.42	17.85	277
19-Aug-24	461.09	93.19	25.67	579.95
20-Aug-24	826.84	236.32	35.28	1098.44
21-Aug-24	683.87	367.49	62.19	1113.55
22-Aug-24	778.45	293.66	38.98	1111.09
23-Aug-24	839.46	326.48	20.31	1186.25
24-Aug-24	204.06	176.04	15.93	396.03
26-Aug-24	308.36	320.34	29.8	658.5
27-Aug-24	248.08	191.41	29.76	469.25
28-Aug-24	384.89	376.18	72.18	833.25
29-Aug-24	476.44	274.88	39.92	791.24
30-Aug-24	418.23	344.95	49.07	812.25
31-Aug-24	153.96	54	13.29	221.25
Grand Total				26175.09

*Computer generated report signature not required.

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INDIAN ENERGY EXCHANGE

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-24	955.05	444.01	65.95	1465.01
02-Aug-24	1025.71	1192.57	46.87	2265.15
03-Aug-24	649.25	1225.3	39.85	1914.4
04-Aug-24	430.02	1669.72	102.12	2201.86
05-Aug-24	340.84	318.21	49.88	708.93
06-Aug-24	541.28	388.84	57.08	987.2
07-Aug-24	683.8	445.52	77.23	1206.55
08-Aug-24	609.91	308.43	69.33	987.67
09-Aug-24	454.07	207.65	27.99	689.71
10-Aug-24	140.82	84.03	17.32	242.17
12-Aug-24	401.64	400.56	78.25	880.45
13-Aug-24	422.53	252.54	40.43	715.5
14-Aug-24	727.12	222.68	27.6	977.4
16-Aug-24	518.88	206.77	40.93	766.58
17-Aug-24	181.5	67.73	17.17	266.4
19-Aug-24	445.27	89.98	24.8	560.05
20-Aug-24	798.46	228.21	34.05	1060.72
21-Aug-24	660.4	354.89	60.06	1075.35
22-Aug-24	751.73	283.6	37.64	1072.97
23-Aug-24	810.66	315.26	19.62	1145.54
24-Aug-24	197.05	169.99	15.4	382.44
26-Aug-24	298.78	310.37	28.87	638.02
27-Aug-24	240.37	185.46	28.83	454.66
28-Aug-24	372.91	364.5	69.93	807.34
29-Aug-24	461.62	266.33	38.7	766.65
30-Aug-24	405.24	334.23	47.54	787.01
31-Aug-24	149.19	52.31	12.88	214.38
Grand Total				25240.11

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-24	924.69	429.88	63.85	1418.42
02-Aug-24	993.1	1154.64	45.38	2193.12
03-Aug-24	628.58	1186.35	38.59	1853.52
04-Aug-24	416.34	1616.63	98.88	2131.85
05-Aug-24	330	308.1	48.29	686.39
06-Aug-24	524.08	376.48	55.25	955.81
07-Aug-24	662.06	431.36	74.76	1168.18
08-Aug-24	590.51	298.62	67.13	956.26
09-Aug-24	439.64	201.05	27.09	667.78
10-Aug-24	136.33	81.36	16.77	234.46

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*Computer generated report signature not required.

12-Aug-24	388.87	387.82	75.77	852.46
13-Aug-24	409.1	244.51	39.13	692.74
14-Aug-24	704	215.6	26.72	946.32
16-Aug-24	502.37	200.2	39.64	742.21
17-Aug-24	175.73	65.58	16.62	257.93
19-Aug-24	431.11	87.12	24.01	542.24
20-Aug-24	773.08	220.93	32.98	1026.99
21-Aug-24	639.39	343.6	58.16	1041.15
22-Aug-24	727.83	274.56	36.46	1038.85
23-Aug-24	784.9	305.23	18.99	1109.12
24-Aug-24	190.79	164.58	14.92	370.29
26-Aug-24	289.28	300.5	27.95	617.73
27-Aug-24	232.74	179.57	27.91	440.22
28-Aug-24	361.06	352.9	67.71	781.67
29-Aug-24	446.94	257.87	37.46	742.27
30-Aug-24	392.35	323.6	46.03	761.98
31-Aug-24	144.45	50.65	12.47	207.57
Grand Total				24437.53

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
01-Aug-24	924.69	429.88	63.85	1418.42
02-Aug-24	993.1	1154.64	45.38	2193.12
03-Aug-24	628.58	1186.35	38.59	1853.52
04-Aug-24	416.34	1616.63	98.88	2131.85
05-Aug-24	330	308.1	48.29	686.39
06-Aug-24	524.08	376.48	55.25	955.81
07-Aug-24	662.06	431.36	74.76	1168.18
08-Aug-24	590.51	298.62	67.13	956.26
09-Aug-24	439.64	201.05	27.09	667.78
10-Aug-24	136.33	81.36	16.77	234.46
12-Aug-24	388.87	387.82	75.77	852.46
13-Aug-24	409.1	244.51	39.13	692.74
14-Aug-24	704	215.6	26.72	946.32
16-Aug-24	502.37	200.2	39.64	742.21
17-Aug-24	175.73	65.58	16.62	257.93
19-Aug-24	431.11	87.12	24.01	542.24
20-Aug-24	773.08	220.93	32.98	1026.99
21-Aug-24	639.39	343.6	58.16	1041.15
22-Aug-24	727.83	274.56	36.46	1038.85
23-Aug-24	784.9	305.23	18.99	1109.12
24-Aug-24	190.79	164.58	14.92	370.29
26-Aug-24	289.28	300.5	27.95	617.73

*Computer generated report signature not required.

IEX
INDIAN ENERGY EXCHANGE

Certificate of Purchase of Renewable Energy in Green-Day Ahead Market

For the Month of : September-2024 **Issued on :** 01/10/2024

Portfolio Name: **BEST**

This is certified that BEST has purchased 33823.70 MWh (at regional periphery) of Renewable Energy for the period 01/09/2024 to 30/09/2024 through Indian Energy Exchange Limited in Green-Day Ahead Market.

Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
22454.78	8615.91	2753.01	33823.7

This certificate represented hereby is issued on non-transferable and non-tradable basis and shall be held subject to Orders and Regulations of Honorable Central Electricity Regulatory Commission as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

Amit Kumar
ED Market Operations

B.E.S. & T. Undertaking
बेस्ट
Power Purchase Dept.

*Computer generated report signature not required.

INDIAN ENERGY EXCHANGE

Annexure 1- (Date Wise Scheduling Details)

Participant ID	**W2MH0BST0000**
Participant Name	**Brihanmumbai Electric Supply & Transport (BEST)**
Portfolio ID	**W2MH0BST0001**
Portfolio Name	**BEST**

Scheduling details at Regional Periphery (Traded)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Sep-24	619.91	184.55	48.79	853.25
03-Sep-24	430.72	245.36	66.96	743.04
04-Sep-24	458.06	258.35	59.71	776.12
05-Sep-24	566.2	294.98	69.3	930.48
06-Sep-24	521.36	251.09	44.3	816.75
07-Sep-24	184.38	81.03	14.09	279.5
09-Sep-24	927.1	277.64	74.51	1279.25
10-Sep-24	1045.7	268.94	62.36	1377
11-Sep-24	860.88	281.92	66.2	1209
12-Sep-24	698.37	435.65	105.72	1239.74
13-Sep-24	759.56	433.54	70.15	1263.25
14-Sep-24	422.42	174.23	33.88	630.53
15-Sep-24	169.15	177.32	40.06	386.53
16-Sep-24	812.39	176.05	43.99	1032.43
17-Sep-24	489.99	108.48	33.78	632.25
18-Sep-24	743.04	245.91	106.28	1095.23
19-Sep-24	833.32	230.73	102.7	1166.75
20-Sep-24	852.84	194.78	82.38	1130
21-Sep-24	710.46	167.12	70.17	947.75
22-Sep-24	163.77	41.93	10.55	216.25
23-Sep-24	646.82	410.96	252.15	1309.93
24-Sep-24	1632.17	504.56	198.96	2335.69
25-Sep-24	1815.47	290.65	137.88	2244
26-Sep-24	289.73	200.16	123.9	613.79
27-Sep-24	1664.22	783.22	213.21	2660.65
28-Sep-24	1138	503.66	156.56	1798.22
29-Sep-24	693.15	694.8	249.3	1637.25
30-Sep-24	2305.6	698.3	215.17	3219.07
Grand Total				33823.7

*Computer generated report signature not required.

B.E.S. & T. Undertaking बेस्ट Power Purchase

INDIAN ENERGY EXCHANGE

Scheduling details after applying ISTS (POC) loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Sep-24	599.99	178.64	47.22	825.85
03-Sep-24	416.91	237.46	64.8	719.17
04-Sep-24	443.33	250.04	57.8	751.17
05-Sep-24	548.01	285.51	67.08	900.6
06-Sep-24	504.62	243.03	42.87	790.52
07-Sep-24	178.46	78.43	13.64	270.53
09-Sep-24	897.88	268.88	72.17	1238.93
10-Sep-24	1012.79	260.46	60.39	1333.64
11-Sep-24	833.77	273.03	64.11	1170.91
12-Sep-24	676.36	421.93	102.4	1200.69
13-Sep-24	735.63	419.88	67.94	1223.45
14-Sep-24	409.1	168.74	32.82	610.66
15-Sep-24	163.83	171.73	38.79	374.35
16-Sep-24	787.35	170.62	42.64	1000.61
17-Sep-24	474.92	105.14	32.72	612.78
18-Sep-24	720.16	238.33	103	1061.49
19-Sep-24	807.64	223.63	99.54	1130.81
20-Sep-24	826.57	188.78	79.84	1095.19
21-Sep-24	688.6	161.96	68.01	918.57
22-Sep-24	158.71	40.63	10.23	209.57
23-Sep-24	625.96	397.69	244.03	1267.68
24-Sep-24	1579.43	488.27	192.54	2260.24
25-Sep-24	1756.82	281.26	133.43	2171.51
26-Sep-24	280.38	193.7	119.9	593.98
27-Sep-24	1610.5	757.93	206.33	2574.76
28-Sep-24	1101.22	487.38	151.51	1740.11
29-Sep-24	670.76	672.35	241.24	1584.35
30-Sep-24	2228.1	674.84	207.94	3110.88
Grand Total				32743

Scheduling details after applying ISTS (POC) and State loss

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Sep-24	580.92	172.95	45.72	799.59
03-Sep-24	403.65	229.91	62.73	696.29
04-Sep-24	429.23	242.08	55.97	727.28
05-Sep-24	530.59	276.42	64.95	871.96
06-Sep-24	488.56	235.31	41.52	765.39
07-Sep-24	172.78	75.95	13.2	261.93
09-Sep-24	869.33	260.33	69.87	1199.53
10-Sep-24	980.55	252.19	58.48	1291.22

*Computer generated report signature not required.

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IEX
INDIAN ENERGY EXCHANGE

11-Sep-24	807.24	264.36	62.07	1133.67
12-Sep-24	654.85	408.51	99.14	1162.5
13-Sep-24	712.23	406.53	65.78	1184.54
14-Sep-24	396.09	163.38	31.78	591.25
15-Sep-24	158.59	166.27	37.56	362.42
16-Sep-24	762.31	165.2	41.28	968.79
17-Sep-24	459.82	101.78	31.7	593.3
18-Sep-24	697.26	230.75	99.73	1027.74
19-Sep-24	781.97	216.51	96.38	1094.86
20-Sep-24	800.29	182.76	77.32	1060.37
21-Sep-24	666.71	156.81	65.84	889.36
22-Sep-24	153.65	39.34	9.9	202.89
23-Sep-24	606.05	385.05	236.27	1227.37
24-Sep-24	1529.23	472.73	186.41	2188.37
25-Sep-24	1700.96	272.32	129.17	2102.45
26-Sep-24	271.46	187.54	116.09	575.09
27-Sep-24	1559.28	733.82	199.78	2492.88
28-Sep-24	1066.21	471.88	146.69	1684.78
29-Sep-24	649.42	650.98	233.58	1533.98
30-Sep-24	2157.26	653.36	201.33	3011.95
Grand Total				31701.75

Scheduling details after applying ISTS (POC) Loss, State Loss, Distribution Loss and Other Loss if any (at Ex-bus)

Delivery Date	Solar (in MWh)	Non-Solar (in MWh)	Hydro (in MWh)	Total (in MWh)
02-Sep-24	580.92	172.95	45.72	799.59
03-Sep-24	403.65	229.91	62.73	696.29
04-Sep-24	429.23	242.08	55.97	727.28
05-Sep-24	530.59	276.42	64.95	871.96
06-Sep-24	488.56	235.31	41.52	765.39
07-Sep-24	172.78	75.95	13.2	261.93
09-Sep-24	869.33	260.33	69.87	1199.53
10-Sep-24	980.55	252.19	58.48	1291.22
11-Sep-24	807.24	264.36	62.07	1133.67
12-Sep-24	654.85	408.51	99.14	1162.5
13-Sep-24	712.23	406.53	65.78	1184.54
14-Sep-24	396.09	163.38	31.78	591.25
15-Sep-24	158.59	166.27	37.56	362.42
16-Sep-24	762.31	165.2	41.28	968.79
17-Sep-24	459.82	101.78	31.7	593.3
18-Sep-24	697.26	230.75	99.73	1027.74
19-Sep-24	781.97	216.51	96.38	1094.86
20-Sep-24	800.29	182.76	77.32	1060.37
21-Sep-24	666.71	156.81	65.84	889.36

*Computer generated report signature not required.

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Certificate of Purchase of Renewable Energy Certificate

IEX
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INNOVATION TECHNOLOGY FUTURE

INDIAN ENERGY EXCHANGE LTD.

Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000233 **Issued On: 10-Jul-2024**

BEST Undertaking

Number of Certificates: 249000

This certifies that BEST Undertaking is the holder of 249000 non transferable Renewable energy certificate(s) bought on 10-Jul-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

This is a computer-generated statement hence doesn't require signature.

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PXIL
Transforming Power Markets

POWER EXCHANGE INDIA LIMITED

Certificate of Purchase of REC(s)

Number C - PXMB07241515 **Issued On - 10-JUL-2024**

Serial No. - PXI/ 10072024/REC/01515

Number of Certificates - 248500

This certifies that BEST is the holder of 248500 non transferable Renewable Energy Certificate(s) bought on 10-JUL-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

Regd. Office: Power Exchange India Ltd.9th Floor, 901 ,Sumer Plaza,Marol Maroshi Road,Marol Andheri (East),Mumbai 400 059, India.

CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in

Note: - This is a computer generated statement hence doesn't require signature.

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Certificate of Purchase of Renewable Energy Certificate

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INNOVATION TECHNOLOGY FUTURE

INDIAN ENERGY EXCHANGE LTD.

Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000274 **Issued On: 31-Jul-2024**

BEST Undertaking

Number of Certificates: 342900

This certifies that BEST Undertaking is the holder of 342900 non transferable Renewable energy certificate(s) bought on 31-Jul-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

This is a computer-generated statement hence doesn't require signature.

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Power Purchase Dept.

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Transforming Power Markets

POWER EXCHANGE INDIA LIMITED

Certificate of Purchase of REC(s)

Number C - PXMB07241542 **Issued On - 31-JUL-2024**
Serial No. - PXI/ 31072024/REC/01542
Number of Certificates - 342100

This certifies that BEST is the holder of 342100 non transferable Renewable Energy Certificate(s) bought on 31-JUL-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

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CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in
Note: - This is a computer generated statement hence doesn't require signature.

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Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000296 **Issued On: 14-Aug-2024**

BEST Undertaking

Number of Certificates: 316700

This certifies that BEST Undertaking is the holder of 316700 non transferable Renewable energy certificate(s) bought on 14-Aug-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

This is a computer-generated statement hence doesn't require signature.

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Certificate of Purchase of REC(s)

Number C - PXMB08241555 **Issued On - 14-AUG-2024**

Serial No. - PXI/ 14082024/REC/01555

Number of Certificates - 316000

This certifies that BEST is the holder of 316000 non transferable Renewable Energy Certificate(s) bought on 14-AUG-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

Regd. Office: Power Exchange India Ltd.9th Floor, 901 ,Sumer Plaza,Marol Maroshi Road,Marol Andheri (East),Mumbai 400 059, India.

CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in

Note: - This is a computer generated statement hence doesn't require signature.

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Certificate of Purchase of Renewable Energy Certificate

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Certificate of Purchase of REC(s)

Certificate Number : C-IEX_REC000342

Issued On: 28-Aug-2024

BEST Undertaking

Number of Certificates: 140000

This certifies that BEST Undertaking is the holder of 140000 non transferable Renewable energy certificate(s) bought on 28-Aug-2024 , through Indian Energy Exchange Limited.

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye-laws, Rules and Business Rules of Indian Energy Exchange Limited.

This is a computer-generated statement hence doesn't require signature.

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PXIL
Transforming Power Markets

POWER EXCHANGE INDIA LIMITED

Certificate of Purchase of REC(s)

Number C - PXMB08241568 **Issued On - 28-AUG-2024**

Serial No. - PXI/ 28082024/REC/01568

Number of Certificates - 140000

This certifies that BEST is the holder of 140000 non transferable Renewable Energy Certificate(s) bought on 28-AUG-2024, through *Power Exchange India Limited.*

This certificate represented hereby is issued and shall be held subject to all the provisions of the regulations of Honorable CERC as amended from time to time and the Bye - laws, Rules and Business Rule of *Power Exchange India Limited.*

Power Exchange India Limited

Regd. Office: Power Exchange India Ltd.9th Floor, 901 ,Sumer Plaza,Marol Maroshi Road,Marol Andheri (East),Mumbai 400 059, India.

CIN:- U74900MH2008PLC179152, Phone no.+ 91 22 4009 6667/87, Fax: + 91 22 40096690/33, Website: www.powerexindia.in

Email : pxi_mktops@pxil.co.in

Note: - This is a computer generated statement hence doesn't require signature.

B. E. S. & T. Undertaking * Power Purchase Dept. *
बेस्ट

MAHATRANSCO
Maharashtra State Electricity Transmission Co. Ltd.
MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO.LTD.
CIN NO. U40109MH2005SGC153646

MAHATRANSCO
Maharashtra State Electricity Transmission Co. Ltd.
MAHARASHTRA STATE ELECTRICITY TRANSMISSION CO.LTD.
CIN NO. U40109MH2005SGC153646

Maharashtra State Load Dispatch Center

Tele :91-022-27601762 (P)
91-022-27601931 (O) Extn.1003
Email : cesldc@mahasldc.in
website : www.mahasldc.in

Office of The Chief Engineer
Maharashtra State Load Dispatch Center
Thane-Belapur Road, P.O. Airoli
Navi Mumbai Pin – 400 708.

RIGHT TO INFORMATION

Ref: CE/MSLDC/EA/ No 0 2 3 8 0 **Date:** 19 NOV 2024

To,
As per the mailing list

Sub: Apportionment of Legacy Charges for the period from Oct 2023 to Sept 2024
Ref: WRLDC/MO/DSM-2024/1250 dated 11/11/2024

Dear Sir,

This office is in receipt of above mentioned letter from WRLDC as regards Net Deviation and Ancillary Service Pool Account Deficit Recovery Statement for the period prior to 16.09.2024 (Statement of Legacy Dues)

In this context, the methodology for apportionment of Legacy dues amongst the corresponding State Entities was discussed by conducting an emergency meeting on 18.11.2024. The methodology for apportionment of Legacy dues is as below-

- The charges under the head **'50% in proportion to Actual Drawl (Rs)'** in WRLDC Statement are apportioned on the basis of DSM payable to the State DSM Pool A/c by respective State Entities for the weeks when the State DSM Pool A/c is under deficit.
- The charges under the head **'50% in proportion to GNA granted (Rs)'** are apportioned to the State Entities on the basis of respective GNA granted.

Accordingly, the legacy dues are apportioned and attached herewith as an Annexure-I. The Legacy due amount corresponding to the State Entity pertains to the 1st installment of a total nos. of 20 such equal installments. If payments are delayed beyond ten (10) days from the installment due date, then the defaulting State Entities shall be liable to pay a simple interest @ 0.04% for each day of delay. Installment date and due date of payment is attached as Annexure-II.

The DSM Pool A/c details are as below-
A/c Name: MSLDC DSM Pool A/c
Bank Name: Bank of Maharashtra
A/c No.: 604096305880
IFSC Code: MAHB0001283

It is requested to make the payments within the due date of each installment so as to make timely payments to WRLDC.

Thanking you.

Yours faithfully

(Girish Pantoji)
Chief Engineer-I/C,
MSLDC, Airoli

Copy s.w.r.to-
The Executive Director, MSLDC, Airoli

Apportionment of Net Deviation and Ancillary Services Pool Account Deficit Recovery (Legacy Dues of WRLDC) for the period from 16/09/2023 to 15/09/2024

Sr.No.	State/Drawee DIC	Actual Drawal (MU)	GNA granted (MW)	50% in proportion to Actual drawal (Rs)	50% in proportion to GNA Granted (Rs)	Total Recovery (Rs)	Per Instalment Amount (Rs)
3	Maharashtra	69520.16	9624.22	₹ 1,40,07,61,934.00	₹ 1,27,70,49,737.00	₹ 2,67,78,11,671.00	₹ 13,38,90,584.00

Apportionment of above charges to State Entities for the period from October 2023 to September 2024 is as below:

Sr.No.	State Entity	DSM Payable to Pool under Supplementary Bill (Rs)	GNA granted (MW)	50% in proportion to DSM Payable (Rs)	50% in proportion to GNA Granted (Rs)	Total Recovery (Rs)	Per Instalment Amount (Rs)
1	ADTPS	₹ 1,09,39,032.00		₹ 1,16,02,910.01	₹ 0.00	₹ 1,16,02,910.01	₹ 5,80,145.50
2	APML	₹ 2,32,17,311.00		₹ 2,46,26,344.46	₹ 0.00	₹ 2,46,26,344.46	₹ 12,31,317.22
3	AEML	₹ 13,04,37,971.00	728.33	₹ 13,83,54,110.21	₹ 9,64,27,000.71	₹ 23,47,81,110.93	₹ 1,17,39,055.55
4	AEML SEEPZ Ltd(ASL)	₹ 22,13,875.00		₹ 23,48,232.68	₹ 0.00	₹ 23,48,232.68	₹ 1,17,411.63
5	BEST	₹ 2,16,75,458.00		₹ 2,29,90,918.07	₹ 0.00	₹ 2,29,90,918.07	₹ 11,49,545.90
6	DAUND SUGAR PRIVATE LIMITED	₹ 1,49,25,114.00		₹ 1,58,30,903.01	₹ 0.00	₹ 1,58,30,903.01	₹ 7,91,545.15
7	EON KHARADI (Ph-1)	₹ 9,59,302.00		₹ 10,17,521.00	₹ 0.00	₹ 10,17,521.00	₹ 50,876.05
8	EON KHARADI (Ph-2)	₹ 7,18,720.00		₹ 7,62,338.34	₹ 0.00	₹ 7,62,338.34	₹ 38,116.92
9	GEPL SEZ	₹ 7,41,777.00		₹ 7,86,794.64	₹ 0.00	₹ 7,86,794.64	₹ 39,339.73
10	HADAPSAR SEZ	₹ 4,04,508.00		₹ 4,29,057.15	₹ 0.00	₹ 4,29,057.15	₹ 21,452.86
11	IDEAL ENERGY PROJECTS LIMITED	₹ 34,91,221.00		₹ 37,03,099.42	₹ 0.00	₹ 37,03,099.42	₹ 1,85,154.97
12	JINDAL POWER LIMITED	₹ 1,03,85,335.00		₹ 1,10,15,609.74	₹ 0.00	₹ 1,10,15,609.74	₹ 5,50,780.49
13	JNPT	₹ 51,091.00		₹ 54,191.66	₹ 0.00	₹ 54,191.66	₹ 2,709.58
14	JSW ENERGYLIMITED	₹ 4,07,62,675.00		₹ 4,32,36,517.60	₹ 0.00	₹ 4,32,36,517.60	₹ 21,61,825.88
15	KRC	₹ 25,25,699.00		₹ 26,78,980.94	₹ 0.00	₹ 26,78,980.94	₹ 1,33,949.05
16	LBSCML	₹ 1,28,842.00		₹ 1,36,661.28	₹ 0.00	₹ 1,36,661.28	₹ 6,833.06
17	LLOYDS METALS AND ENERGY LIMITED	₹ 86,17,604.00		₹ 91,40,597.05	₹ 0.00	₹ 91,40,597.05	₹ 4,57,029.85
18	M/s Grace Industries Ltd.	₹ 1,28,196.00		₹ 1,35,976.08	₹ 0.00	₹ 1,35,976.08	₹ 6,798.80
19	M/s. Omsairam Steels & Alloys Pvt Ltd.	₹ 2,14,216.00		₹ 2,27,216.54	₹ 0.00	₹ 2,27,216.54	₹ 11,360.83
20	MADC	₹ 23,30,768.00		₹ 24,72,219.79	₹ 0.00	₹ 24,72,219.79	₹ 1,23,610.99

Sr.No.	State Entity	DSM Payable to Pool under Supplementary Bill (Rs)	GNA granted (MW)	50% in proportion to DSM Payable (Rs)	50% in proportion to GNA Granted (Rs)	Total Recovery (Rs)	Per Instalment Amount (Rs)
21	MSPGCL	₹ 22,25,67,692.00		₹ 23,60,75,084.21	₹ 0.00	₹ 23,60,75,084.21	₹ 1,18,03,754.21
22	MANJARI SEZ	₹ 1,85,341.00		₹ 1,96,589.14	₹ 0.00	₹ 1,96,589.14	₹ 9,829.46
23	MBPPPL SEZ	₹ 11,65,849.00		₹ 12,36,603.11	₹ 0.00	₹ 12,36,603.11	₹ 61,830.16
24	MSEDCL	₹ 28,66,87,306.00	8384.13	₹ 30,40,86,048.15	₹ 1,11,00,14,017.68	₹ 1,41,41,00,065.84	₹ 7,07,05,003.29
25	NIDAR SEZ	₹ 9,90,715.00		₹ 10,50,840.42	₹ 0.00	₹ 10,50,840.42	₹ 52,542.02
26	RAILWAY	₹ 23,37,71,888.00	158.32	₹ 24,79,59,250.74	₹ 2,09,60,722.14	₹ 26,89,19,972.87	₹ 1,34,45,998.64
27	RATTANINDIA POWER	₹ 8,38,125.00		₹ 8,88,989.90	₹ 0.00	₹ 8,88,989.90	₹ 44,449.49
28	SAI WARDHA POWER GENERATION PRIVATE	₹ 9,62,442.00		₹ 10,20,851.56	₹ 0.00	₹ 10,20,851.56	₹ 51,042.58
29	SASPL	₹ 14,617.00		₹ 15,504.09	₹ 0.00	₹ 15,504.09	₹ 775.20
30	SHREE SIDDHESHWAR SAHAKARI SAKHAR KARKHANA LTD,KUMATHE	₹ 1,38,884.00		₹ 1,47,312.72	₹ 0.00	₹ 1,47,312.72	₹ 7,365.64
31	TPC-D	₹ 9,72,49,939.00	375	₹ 10,31,51,932.49	₹ 4,96,47,996.47	₹ 15,27,99,928.96	₹ 76,39,996.45
32	TPCL	₹ 20,11,68,164.00		₹ 21,33,76,842.03	₹ 0.00	₹ 21,33,76,842.03	₹ 1,06,68,842.10
33	Topworth Urja & Metals Limited	₹ 5,549.00		₹ 5,885.76	₹ 0.00	₹ 5,885.76	₹ 294.29
	Sub-Total	**₹ 1,32,06,15,226.00**	**9645.78**	**₹ 1,40,07,61,934.00**	**₹ 1,27,70,49,737.00**	**₹ 2,67,78,11,671.00**	**₹ 13,38,90,583.55**

Note: Only those weeks for the period from Oct 2023 to Sept 2024 are considered in which the State DSM Pool is in Deficit (i.e. Week 31,39,40,46,47,49,52 and 53 of FY 2023-24 and Week 1,6,25,26 and 27 of FY 2024-25)

ANEXURE-II

Instalment date and due date of payment by each State Entities		
Instalment Number	**Instalment Date**	**Due date of payment by State Entities**
1	11-11-2024	21-11-2024
2	18-11-2024	28-11-2024
3	25-11-2024	05-12-2024
4	02-12-2024	12-12-2024
5	09-12-2024	19-12-2024
6	16-12-2024	26-12-2024
7	23-12-2024	02-01-2025
8	30-12-2024	09-01-2025
9	06-01-2025	16-01-2025
10	13-01-2025	23-01-2025
11	20-01-2025	30-01-2025
12	27-01-2025	06-02-2025
13	03-02-2025	13-02-2025
14	10-02-2025	20-02-2025
15	17-02-2025	27-02-2025
16	24-02-2025	06-03-2025
17	03-03-2025	13-03-2025
18	10-03-2025	20-03-2025
19	17-03-2025	27-03-2025
20	24-03-2025	03-04-2025

Entity wise GNA in Maharashtra

(In MW)

Entity/Distribution Licensee	Inside Region PPA	Outside Region PPA	Total PPA	Inside Region Deemed GNA	Outside Region Deemed GNA	Total Deemed GNA (A)	Inside Region Additional GNA	Outside Region Additional GNA	Additional GNA (B)	Inside Region Total GNA	Outside Region Total GNA	Total GNA Granted (A+B)
Maharashtra State Electricity Distribution Company Ltd (MSEDCL)	7988.57	1778.05	9766.62	6857.77	1526.36	**8384.13**	0.00	0.00	**0.00**	6857.77	1526.36	**8384.13**
Adani Electricity Mumbai Limited- Distribution (AEML-D	0.00	33	33	0.00	28.33	**28.33**	0.00	700.00	**700.00**	0.00	728.33	**728.33**
The Tata power Company Ltd-Distribution (TPC-D)	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	375.00	**375.00**	0.00	375.00	**375.00**
Central Railway	2.32	95	97.32	1.99	81.55	**83.54**	61.33	13.45	**74.78**	63.32	95.00	**158.32**
Brihanmumbai Electricity Supply and Transport (BEST)	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**
Total	7990.89	1906.05	9896.94	6859.76	1636.24	8496	61.33	1088.45	**1149.78**	6921.09	2724.69	**9645.78**

Annexure 21

The Brihanmumbai Electric Supply and Transport Undertaking (BEST)

DETAILED PROJECT REPORT
FY2022-23, FY2023-24, FY2024-25and FY2025-26
IN-PRINCIPLE CLEARANCEFOR CAPITAL INVESTMENT SCHEMES

BEST Scheme No: BEST/FY23/06

IMPLEMENTATION OF PREPAID SMART METERING PROJECT

INDEX

Abbreviation

AMI	Advanced Metering Infrastructure
AMI-SP	Advanced Metering Infrastructure-Service Provider
ABT	Availability Based Tariff
CT /PT	Current Transformer / Potential Transformer
DER	Distributed Energy Resource
DMS	Distribution Management System
DR	Demand Response
DSM	Demand Side Management
DT	Distribution Transformer
DBFOOT	Design, Built, Finance, Own, Operate & Transfer
EA	Energy Audit
GIS	Geographical Information System
HES	Head End System
HT	High Tension
LT	Low Tension
IT	Information Technology
MIS	Management Information System
NIC	Network Integration Card or Node
NTP	National Tariff Policy
NW	Network
O&M	Operation and Maintenance
PQ	Power Quality
BEST	Brihan Mumbai Electric Supply & Transport undertaking
RF	Radio Frequency
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
T&D	Transmission and Distribution
ToD	Time of Day
VAR	Volt Ampere Reactive
GoI	Govern of India
RDSS	Revamped Distribution Sector Scheme
AT&C	Aggregate Technical & Commercial
DISCOMs	Distribution Companies
ACS-ARR	Average cost of Supply –Aggregate Revenue Realised
TOTEX	Capital Expenditure + Operational Expenditure
CAPEX / OPEX	Capital Expenditure /Operational Expenditure
PPP	Public Private Partnership
DPR	Detail Project Report
LVCTO	Low Voltage Current Transformer Operated
MDMS	Meter Data Management System
NOMC	Network Operation Monitoring Centre
DCU /DACU	Data Concentrator Unit
ERP	Enterprise Resource Planning
OMS	Outage Management System
WPC	Wireless Planning & Co-ordination
WAN / NAN	Wide Area Network / Neighbourhood Area Network

1. INTRODUCTION:

1.1 The Government of India's initiatives like 'Make in India' and 'Smart Cities' need the efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas to concentrate by governments for the development of country. The government cannot take initiatives for complete change of electrical equipment across the country but there is a need for changing the way of operation and control of the electrical equipment.

1.1.1 Accordingly, Government of India (GoI) has launched the Revamped Distribution Sector Scheme (RDSS) to help DISCOMs to improve their operational efficiencies and financial sustainability by providing result-linked financial assistance to DISCOMs to strengthen supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. Main objective of the scheme is Reduction of AT&C losses to pan-India levels of 12-15% by 2024-25 and Reduction of ACS-ARR gap to zero by 2024-25. Also, improvement in the quality, reliability and affordability of power supply to consumers through a financially sustainable and operationally efficient distribution sector.***For details a copy of MoP letter dated 20 July, 2021 is attached (hard and soft copy) herewith as Annexure-A.***

1.2 Main components of RDSS Schemes are as follows:

1.2.1 Part A – Financial support for up gradation of the Distribution Infrastructure and Prepaid Smart Metering & System Metering.

Part B – Training & Capacity Building and other Enabling & Supporting Activities.

1.2.2 The current DPR is for "Implementation of Prepaid Smart Metering & System Metering" through AMI-SP on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis. The DPR preparation for "Upgradation of the Distribution Infrastructure" is in progress and same will be submitted to MERC separately for obtaining in principleapproval of the Hon'ble Commission

1.2.3 Vide MoP notification dated 17th August 2021, GoI prioritised for all DISCOMS including BEST that "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Prepayment Mode conforming to relevant IS, within the time".Pre-paid smartmetering and system metering are proposed to be implemented through Public Private Partnership (PPP)on OPEX basis.

1.2.4 For availing a grant of Rs. 900 or 15% of the cost per consumer (whichever is lower) under RDSS, for "Implementation of prepaid Smart Metering & System Metering" BEST have to meet pre-qualifying criteria and to achieve basic minimum benchmarks.Further to this, fast-track installation of prepaid Smart Meters by December 2023, an additional incentive of 7.5% of the cost per consumer meter or Rs. 450 (whichever is lower) shall be available to qualified states.

1.3 Introduction of BEST's Revamped Distribution Sector Scheme (RDSS) for AMI-SP:

BEST was submitted a copy of Action Plan & DPRs vide Letter Ref. No. GM/AGMES/18668/2022 dated 22.08.2022 for Loss Reduction works for Rs.2321 Crs, Modernisation & System Augmentation works for Rs. 430.63 Crs and Metering works for

Rs.708.54 Crs and Capacity building & training for Rs. 0.81 Crs, totalling Rs. 3460.98 for availing benefits of the RDSS to improve the services of the consumers. Subsequently, vide Letter No. 02:10:RDSS:2021:I:BEST dated 21.11.2022, Executive Director, for Power Finance Corporation (PFC)has informed that Monitoring Committee for RDSS constituted under Chairmanship of Secretary (power), Govt. of India, in its 13th meeting held on 28.10.2022 has approved the Action Plan and Detailed Project Report (DPRs) for Loss Reduction works and prepaid smart metering works of BEST under RDSS Scheme. For prepaid Smart Metering, out of Rs.708.54 Crs Monitoring Committee has approved only Rs. 659.17 Crs for metering infrastructure and total GBS including incentive for phase –I Rs.146.69 Crs. ***A copy of BEST's Letter and approval from PFC is enclosed as Annexure – B and for detail guidelines of RDSS Schemes kindly refer Annexure-C (only soft copy submitted).***

1.4 Brief information about the tendering process takes place in BEST for awarding turnkey contract to appoint AMI-SP for Implementation of Prepaid Smart Metering under RDSS:

1.4.1 A material is procured as per CAPEX Regulation, 2022, APENDIX-3.

Brief information about the Tender: A tender was opened on 21.07.2022 for appointment of AMI-SP for "Implementation of Prepaid Smart Metering" through open biddingprocesson Maha e-tender Portal. BEST undertaking advertised the tender in the local as well as all over Indiamedia.Initially, Notice of Inviting Tender was advertised for "appointment of full turnkey contractor (AMI-SP) to execute the project under RDSS". Due to the poor response from the bidders, multiple extensions were given. Finally, tender was opened on 21st July, 2022. Afteropening of the tender, it is observed that six bidders have taken part in the bidding processand it has been observed that the rates quoted by the firms, particularly towards the execution ofPrepaid smart metering project.

1.4.2 Details of offers received for appointment of AMISP:

In tender document it has been clearly mentioned that the tender evaluation shall be done on the basis of Reverse Auction Process (RAP) between the Eligible and Qualified Tenderers to appoint AMI-SP for implementation of Smart metering Pre-payment system Project. In the said tender, six bidders have taken part. Accordingly, out of Six Tenderers, Pricebid of the three eligible Tenderers has been opened and same is given in the following table.

Bidder No.	Tenderers	Gross Rate Including GST tax. (in Rs.)	Rank
1	M/s. Fluent Grid Pvt Ltd	1559,99,75,299.00	3
2	M/s. Adani Transmission Ltd (ATL)	1528,26,00,331.34	2
3	M/S. Ashoka Buildcon Ltd.	1313,16,31,180.00	1 (LAO)

As per above, offer of the Bidder No. 3 was Lowest (LAO), however, in the reverse option method, bidder 2 has matched their rates with the LAO and further reducing the Cost by 10 Crore at price of Rs. 1303.16 Crore M/s. ATL succeed to get Order. This type of contract is being awarded for the first time in the BEST Undertaking.

Accordingly, for cost estimation purpose, the cost arrived through this tender is considered.

Sr. No.	Bidder No.	Basic Cost in Rs.	Total Tax 18%	Gross Cost in Rs.
1	2	11,04,37,55,237.00	1,98,78,75,942.89	13,03,16,31,179.89

A Letter of Award (LoA) has issued to ATL and soft copy of the same is enclosed as Annexure-D.

2. Challenges in the BEST Undertaking:

2.1 Performance of any Electric distribution utility is measured over following crucialParameters.

- Cost of supply including T&D loss
- Customer services
- Management of demand curve – supply reliability
- Electricity supply quality

2.2 In the current dynamic scenario where consumers are installing roof top solar systems,updated their vision and have added following vision statements:

- Active participation of consumers in managing load curve
- Integration of distributed generation, batteries etc.
- Faster information to consumers
- Self-healing system
- Optimum utilization of asset and resources

2.3 BEST distributes electricity in the island city of Mumbai. Its area of distribution lies fromSouth Mumbai to Sion in the East and to Mahim in the West. BEST distributes power to an area spread over about 69 sq.km and provides electric supply to more than10 Lakhs consumers connected to its distribution network, comprising residential, commercialand industrial consumers, depending on the purpose of use of electricity.

2.4 Presently, BEST is not having such type of AMI infrastructure. So, the BEST is facing issues like wrong manual reading, delay in detection of defective meters, amendmentsand related disputes.

2.5 The mission of BEST undertaking is to provide economical, reliable and quality electricitysupply to all consumers connected to its network. Though BEST’s present network hasstatic and few electro-mechanical meters in the system. The key challenges are to ensure that:

- Data/ information are communicated back at desired frequency in desired formats
- All desired information/ data/ events are generated
- All data/ information is processed
- All data/ information is analyzed to meet company objectives and for routineoperations
- Smart actions are taken based on data/ information analytics
- Customer Inclusion is achieved
- Asset optimization and operational efficiency
- There is improvement in Power Quality

3 Objective of the Scheme

3.1 **Objective**: To adopt technological advancements in energy metering to achieve Reduction in loss, for accurate measurement of energy, to provide improved service to consumers, to release new supply and to replace electromechanical and static metersby smart meters.

The AMI-SP will make 100% upfront capital investment and will recover its investments on long term from the gains of the projects on **OPEX basis**.

3.2 Introduction to the smart meters:

(i) After replacement of electro-mechanical meters with static meters, transition from static meters to smart meters is one of the most important steps towards improving consumer metering. Smart meters are a key component of a power supply system and play a significant role in revenue protection, quality control, compliance with regulatory requirements, consumer satisfaction and image building. The present billing system has chances of error and it is also time consuming. In the existing meter system, consumers are presented with usage information only once a month with their bill.

(ii) The smart meter is very essential to collect precise and appropriate data in a timely manner which includes gathering of data, its communication and storage. The smart meter allows the bi-directional flow of information from consumer to utility and vice versa. The data communication in real time basis allows the utilities with advantages like real time pricing, outage detection, identification of power theft, avoids meter data tampering and provides better service. With the data received in timely manner utilities shall have a better opportunity to work better with increased stability.Efficient metering practices help to maintain the financial health of a utility. These include accurate billing and prevention of power theft, which have been the focus areas for utilities. These practices also help in lowering aggregate technical and commercial losses of the utilities.

(iii) Advance metering infrastructure (AMI), automated meter reading (AMR), pre-paid meters and net meters are the key technologies of smart metering being adopted. This will help in improving metering efficiency, billing accuracy, revenue management and consumer satisfaction.

In light of the above-mentioned possibilities, BEST has reviewed its present metering system and data collection system for implementation AMI / Smart Metering. The key equipment and infrastructure required for this purpose include:

- Smart meters for data generation
- Communication infrastructure RF mesh network/ cellular network or both
- HES (Head End System) for data acquisition and Network ManagementSystem(NMS)
- Other Accessories required to integrate AMI System
- Fieldoperationsapp
- Networkoperationsmonitoringcentre

3.3 Scope of the work:

PART-A

1. Supply, installation, integration, testing and commissioning of **Single phase** whole current Smart Meter with inbuilt NIC module – (Consumer Meter, inclusive of 10 Net meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M includingdata availability (Single Phase, Qty – 901212 Nos.).

2. Supply, installation, integration, testing and commissioning of **Three phase** LT-CT operated Smart Meter with inbuilt NIC module (with Net-Metering) – DT Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability(Three Phase, Qty – 168419 Nos.).

3. Supply, installation, integration, testing and commissioning of Three Phase HT current Smart Meter with inbuilt NIC module (Inclusive of 12 nos. Existing Solar/Net Meter Consumers) – Consumer Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 206 Nos.).

4. Supply, installation, integration, testing and commissioning of three phase LT-CT operatedSmart Meter with inbuilt NIC module (Inclusive of 97 nos. Existing Solar/Net Meter Consumers) – Consumer Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 6053 Nos.).

5. Supply, installation, integration, testing and commissioning of Three phase LT-CT operated Smart Meter with inbuilt NIC module (with Net-Metering) – DT Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 3398 Nos.).

6. Supply, installation, integration, testing and commissioning of Three phase CT/PT operated Smart Meter with inbuilt NIC module – Feeder Meter (with suitable box & TTB arrangement for individual meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 1255 Nos.).

7. Supply, installation, integration, testing and commissioning of Three phase CT/PT operated Smart Meter with inbuilt NIC module (ABT Meters) (With Suitable box & TTB arrangement for individual meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability(Three Phase, Qty – 133 Nos.).

PART-B:

8. Supply and installation of Meter Boxes for DT check meters (Qty – 3398 Nos.).
9. Supply and installation of LTCTs of LT CT Meters (Set of 3 CTs) (Qty- 6053Nos.).
10. Supply and installation of LT CTs for DT metering (Ring Type) (Qty – 5610 Nos.).

PART-C-New requirement for software

11. Architecture, Security and Integration Specialists
12. Data Base Developer- Sr., Web/ Mobile Application Developer- Sr. andCore Application Developer- Sr.
13. Data Base Developer- Jr., Web/ Mobile Application Developer- Jr. and Core Application Developer- Jr.

A copy of detail scope of work is enclosed as Annexure-E.

3.4 Indicative list of meters to be replaced with Smart Meters

Sr. No.	Meter Type	Quantity(in Nos.)
1	Single Phase Meter-WC	901212
2	Three Phase Meter-WC	168419
3 #	Three Phase Meter-LTCT	6053
4	Three Phase Meter-LTCT DT Meter	3398
5	Three Phase Meter-HTMeters	206
6	Three Phase Meter –HT Feeder Meter	1255
7	Three Phase Meter-CT/PT Operated ABT Meter	133
	GRAND TOTAL	**10,80,676**

#- LTCT meters includes 97 Nos. existing Net Meters

3.5 Technical Feasibility of the Scheme:

3.5.1 **Statutory Requirement**:

As per Section 55(1) of Electricity Act 2003, it is mandatory to the Distribution Licensee to supply Electricity to the consumers after installation of Energy Meter for measurement of correct metering of the electricity supplied to the consumers. The Clause is reproduced as below:

"No Licensee shall supply electricity, after the expiry of two years from the appointed date, except through installation of a correct meter in accordance with the regulation to be made in this behalf by the authority."

3.5.2 As per MYT Regulation 75.7 *"A Distribution Licensee may undertake Opex schemes for system automation, new technology and IT implementation, etc., and, such expenses may be allowed over and above normative O&M Expenses, subject to prudence check by the Commission: Provided that the Distribution Licensee shall submit detailed justification, cost benefit analysis of such schemes as against capex schemes, and savings in O&M expenses, if any"*

3.5.3 Justification of the Capital Investment Scheme (Need of Investment):

Technical Justification:

(i) Every new connection is required to be released after installing a meter as per the Electricity Act, 2003. BEST has proposed installation of smart meters in this DPR during FY 2023-24, FY 2024-25& FY 2025-26.

(ii) As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulation. 2021 and Electricity (Rights of Consumers) Rules, 2020, all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading: further to that all the existing meters whenever replaced shall be replaced only by Smart Meter or Meter having at least the facility of remote reading.

(iii) The characteristics ofmeters to be procured for new connections will conform to the CEA(InstallationandOperationofMeters)Regulations,2006.

(iv) As per MoP, Notification dated 17thAugust, 2021 "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Prepayment Mode conforming to relevant IS, within the time" Accordingly, BEST have decided to replace all existing Energy Meters with Smart Meters working with Prepayment Mode under RDSS Project. ***A copy of SoP Regulation, 2021 &MoP2021 Notification is enclosed as Annexure- 'F'.***

(v) In line with the above technical requirements, BEST has prepared this Detailed Project Report (DPR) to replace static meters with smart meters for all consumers, along with setting up the backbone communications infrastructure and related IT systems. The communication backbone facilitates the acquisition of data from smart meters and brings it to central server. The IT/OT software installed in the server takes care of the huge data collected from the field. This data is then shared with other applications like billing, GIS, SCADA etc. and generated reports. Looking at the consumer base of more than 10 lakhs, BEST has planned to replace existing meters with smart meters.

4. Brief Description of the Pre-paid Smart Metering Project

4.1 Solution Architecture

Implementation of Smart metering technologies will enable two-way communication between the meter and the central system. Such an advanced metering infrastructure (AMI) differs from automatic meter reading (AMR) in that it enables two-way communication between the meter and the utility.

TheAMI/SmartMeteringsystemis explained below:

4.2 AdvancedMeteringInfrastructure(AMI):

This Advanced Metering Infrastructure (AMI) refers to technologies and communications systems necessary to acquire customer meter data and events on regular intervals (hourly or "n" hour basis) and allow for daily or more frequent retrieval of the data. Advanced metering can enhance a customer's ability to reduce demand in response to a higher price and the utility's ability to meter and monitor the customer electricity usage. Such metering system can also allow an electric utility to provide a variety of innovative services to benefit customers and to reduce the utility's costs of operations.AMI communicates between utility control centre and consumer smart meters. BEST has initiated significant efforts to improve performance and energy efficiency in terms of AMI implementation initiative.

AMI or Smart Metering System establishes a mechanism for the residential, commercial and industrial customers, enabling energy audit to detect high loss, remote service disconnection /reconnection capability and consumer interactive interface.

It is a pivotal information source, which, when used effectively, can drive enterprise efficiencies and benefits throughout the distribution business, including:

Immediate Objectives	Long Term Objectives
• T&D Loss reduction ○ Theft detection	• Enabling value-added services
• Improved Collection ○ Pre-Paid and Post- Paid Options ○ Disconnection in case of non-payment	• Reduced capacity requirements &improved asset utilization • Increased service reliability
• Energy Audit ○ Online energy audit ○ Technical Loss analysis ○ Feeder Health report	• Enabling Demand Response (DR) & Smart Grid technologies
• Customer Satisfaction ○ Interactive Display ○ Auto power failure feed back ○ Consumption monitoring	• Improved load forecasting and modeling, system planning & engineering. • Improved transformer load management • Smart home control • DER Integration (a)

4.3 Overall System Architecture:

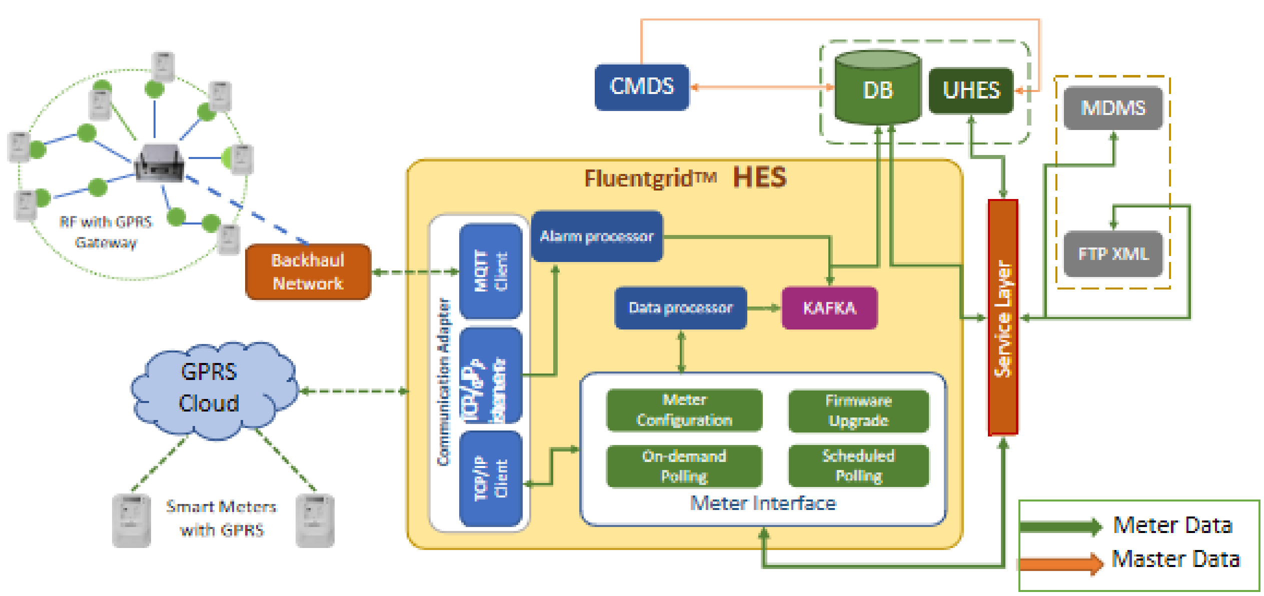

Fig-Solution Architecture (proposed and will be finalised during design phase)

4.4 BEST'sAMIProject:

- Supply, installation, integration, testing and commissioning of Smart pre-paid metering
- Communication Infrastructure to ensure the performance levels
- Head End System (HES) and deployment on Cloud
- AMI Systemintegration
- Network Operation cum Monitoring Centre with suitable backend communication infrastructure, hardware and power supply
- All the necessary software along with valid licenses relevant to the Project
- Consumer indexing on de-novo basis for contiguous electrical locations in the selected AMI area and regular updates during the contract period
- Comprehensive Consumer engagement plan in consultation with utility and implement its part of its activities as per the developed plan
- Operation, maintenance, and support services after the successful completion of the Operational Go-Live of the system

4.4.1 Proposed SmartMeteringSystemto be implemented by AMI-SP in BEST shall consist of followingkeycomponents:

I Smart Meters
II Communication Network
III Systems & Applications: Head End System (HES) and deployment on Cloud
IV AMI Integration (Para 4.2)

I. SMART METERS

Smart Meter is a composite unit consisting of metrology elements, two-way communication module(s) and control elements. It will have functions such as measurement, computation, event capturing, storing, communication and control. Smart Meter communication, it is envisaged that plug and play type communicationmodules shall be deployed in the smart meter, for any given communication technology. These modules shall be field-deployable, with corresponding communication interface modules being used in theDCU/Gateway or BTS of wide area network. The Network Interface Card (NIC) / Communication Module should be integrated with at least 3 (three) makes of meters in India to enable the respective meters to seamlessly integrate with proposed HES and/or MDM thus enabling interoperability of the system. At BEST, procurement of Smart Meters shall be as per the StandardIS16444, issued by BIS (Bureau of Indian Standards).

II. COMMUNICATION NETWORK

AMI-SP may use RF mesh network/ cellular network or a combination of both for collecting the date for smart meters. This Communication networkcomprises of a number of gateways. Network gateways shall be deployed across BESTs distribution area to provide RF coverage for end devices incorporating the communication nodes. This mesh network shall operate in unlicensed frequency band (865-867MHz). Communication network shall also provide reliable medium for two-way communication between various nodes (Smart Meter, Gateway/Router/Access Point/DCU (wherever applicable)) & HES. RF based network should use unlicensed frequency band as permitted by WPC. Meter data shall be routed /collected by field devices like Gateway /Router/Access Point, Data Concentrator Units (DCUs) wherever applicable given the communication technology used and transported to HES through WAN back haul connectivity.

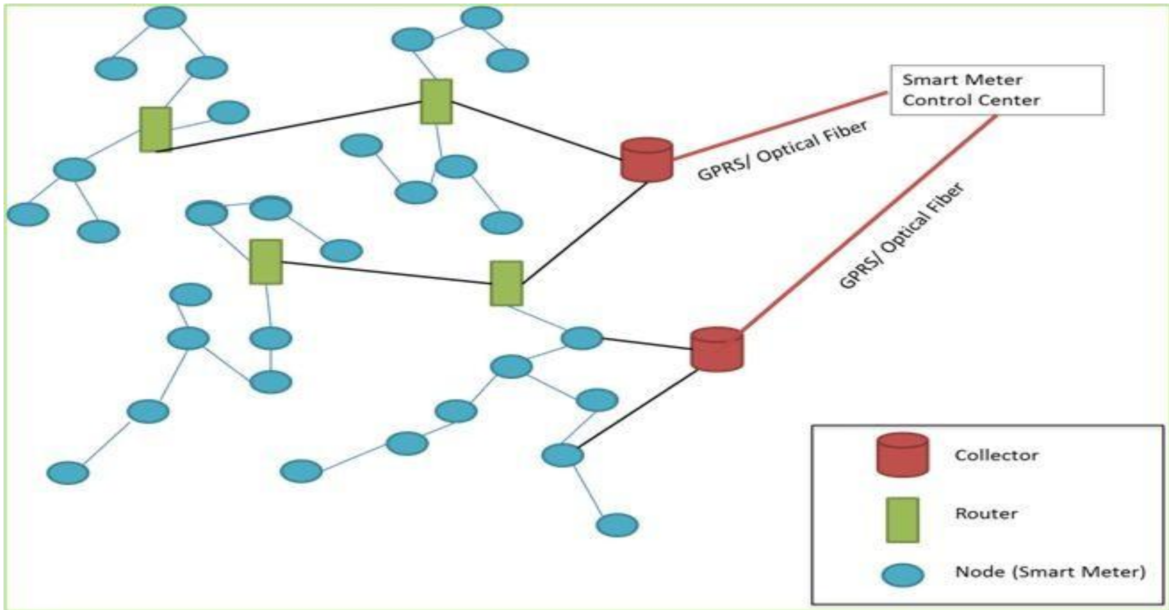

Fig. AMIMeshNetwork

The entire supplied communication infrastructure (Cellular based NIC or RF based devices (DCU /Router/access points wherever applicable) must have 4G with fallback to 2G connectivity. It should be upgradable to future communication technologies like 5G. AMI-SP shall confirm that the communication infra supplied should comply with as on date government, WPC, industry rules, standards, regulations and norms.

III. SystemsandApplications

a. HEAD ENDSYSTEM(HES) and DEPLOYMENT OF CLOUD

The main objective of HES is to acquire meter data automatically avoiding any human intervention and monitor parameters acquired from meters. HES shall exchange data with network terminals and field devices. It shall perform communication network management, field device management, device data management and processing of the data before exchanging to other systems (ERP, GIS, SCADA, and OMS etc).

HES should support various generations of cellular technologies and upcoming technologies like 5G and shall be responsible for autodiscovery of all Smart Meters once deployed in the field, the periodic collection of all meter data as well as the processing of all alarms and commands such as connect/disconnect for those meters.

HES should be able to do simultaneous communication with the entire supplied infrastructure (Cellularbased NIC or RF based devices (DCU/Router/access points wherever applicable) on RF mesh or 4G with fall back to 2G connectivity. It should support to future communication technologies like 5G. Supplied HES along with NMS should comply with the, as on date government, WPC, industry rule, standards, regulations and norms.

DEPLOYMENT CLOUD: -CLOUDSERVICEPROVIDERS(CSP)

For implementation of AMI / Smart Metering project, a cloud-based applications shall be used. The cloud data centre shall have to comply with requirements of tier III category which applies to a concurrently maintainable site infrastructure with redundant capacity components and multiple independent distribution paths serving the critical environment. All IT equipment shallbedual powered.

DATA CENTRE UNIT (DACU)

The Data Concentrator Unit is a gateway for communication of data between the Smart Meters and the HES. The Data Concentrator Unit receives information from the Smart Meter on a scheduled /need basis and passes it on to HES.

The DCU provides the central link between Smart Meters and HES, enabling continuous/periodic meter read and control. DCU shall exchange data from Smart Meters on RF communication and with HES on WAN.

b. NetworkManagementSystem(NMS)

The Network Management System (NMS) function within the HES shall manage, monitor and control the smart meters, RF Nodes, gateways and meshed communication network and its associated devices.This module shall provide real time information about the IP network and its associated NAN/WAN modules in the field device/s.

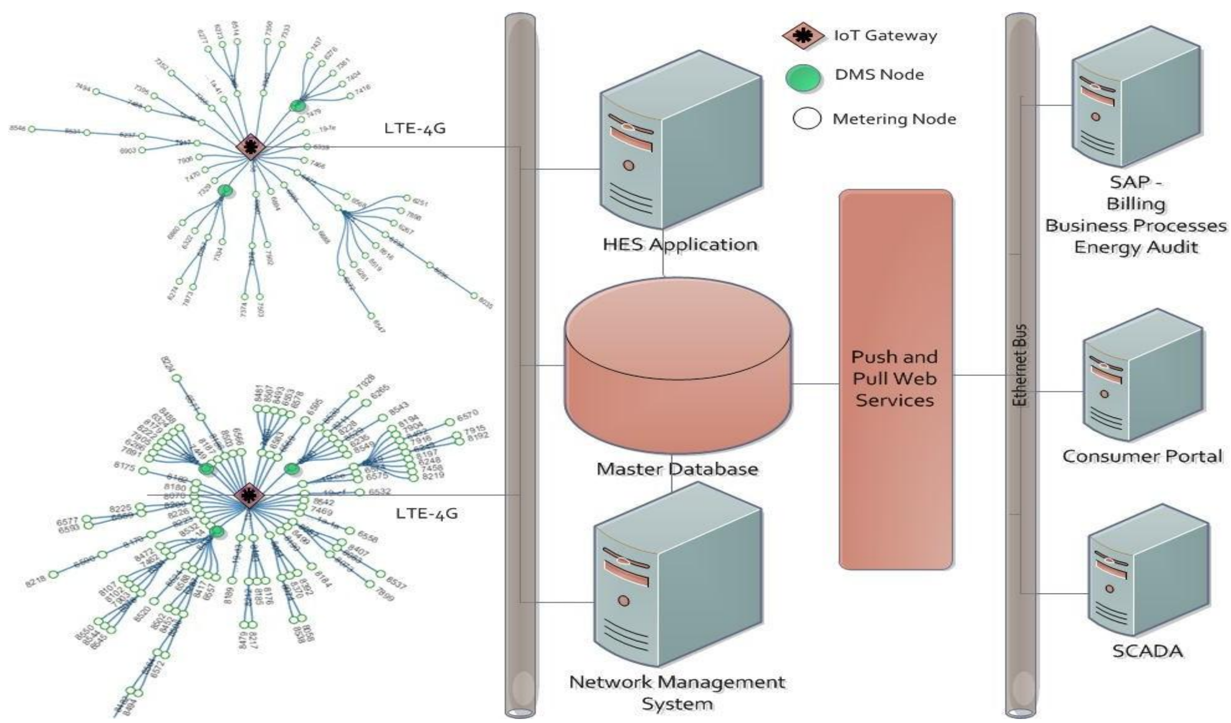

Fig. Thetypicalarchitecture of AMI system is shown above (ProposedArchitecture)

Master database should be HES database. The push and pull, SAP billing business processes Energy audit, SCADA, Consumer portal are shown only for information and are not covered under AMISP DPR

c. NETWORK COMMUNICATION

The network communications software shall use a standard network protocol such as TCP/IP, UDP etc. and shall support IPv6. The software shall link dis-similar hardware nodes such as local and remote work stations and peripheral devices into a common data communication network allowing communications among these devices. The network communication software shall include network security, security management, patch management and network services of the AMI system. Network communication software shall have scalability feature as envisaged.

d. OPERATING SYSTEM

The operating system of all the equipment of AMI application system including network equipment shall be latest version released upto six months prior to FAT. The operating system shall be hardened to provide robust security. The operating system and data file shall be placed in different disk partitions.

In order to facilitate cyber security requirement including patch management, common operating system is preferable to be used by all server nodes within the AMI application including MDM/HES servers. This is also to minimize the maintenance. All licenses for Operating System and other application software shall be supplied by the AMI-SP and shall bevalid throughout the contract period.

4.4.2 SYSTEM FEATUIRES

The following outcomes are expected once the smart metering system is implemented with the necessary software and integration:

- End to end solution for metering, load management, energy audit & MIS report generation
- Ease of maintenance of NW with real-time information
- Scalability to include LT consumers
  - Economical AMR solution (two-way communication)
  - Remote connect/ disconnect feature
  - Split metering to restrict tampering
  - On-line tamper detection and monitoring
- Customer Interface
  - Real time monitoring
  - Online profile
  - Payment and history maintenance
- Ease of monitoring & analysis as critical reports are formulated automatically

- No consumption in past 24 hours
- Energy imbalance for a group of meter
- Disconnected consumers
- Events/ Tamper report

- Automatic Meter Reading
  - Reliable Meter data
  - Prompt billing every month at fixed date
  - No intrusion at consumers premises
  - Can service customer’s request for billing data as-on-time
- Remote Connect/Disconnect
  - Can disconnect/reconnect customer have based on defaults
  - Can temporarily disconnect/reconnect based on requests
  - Can use auto-disconnect if load limit exceeds
  - Useful for regulating peak demand usage
  - Facility to switch to Pre-payment
- Online Event/Tamper Detection
  - Detects and reports any meter box opening
  - Detects and reports any bypass of meter
  - Reports zero consumption users daily
- Real Time Energy Audit
  - Check-meters provide real-time periodic consumption report
  - Gives a daily input regarding loss per transformer
  - Can corroborate daily all DT consumption report with energy input in a rea
- Intelligent Load Management
  - Load limiting per connection
  - Monthly consumption limit per connection
  - Intelligent cut-off on occurrence of High voltage than limit
  - Load switch option on to control Geysers / AC & such heavy loads etc
  - Transformer level load can be monitored to avoid over loading.

5. Costing of the project

5.1 The smart metering Project components:

(i) Smart Meters-Single Phase, Three Phase, LVCTO /DT meters, HT& ABT Meters,
(ii) Meter boxes and LT Ring Type CTs for DT metering, LT CT Banks
(iii) AMI Components (iv) O&M Charges (v) Interest on debt capital and (vi) RoE

5.2 Item wise costing

Item wise pert unit cost, Qty and total cost is given in the following table:

Sr. No.	Particulars	Unit Cost Gross (in ₹)	Qty (in Nos.)	Cost(in ₹)
1	Single Phase Smart meters with installation, communication & integration	11011.83	901212	9923993337.96
2	Poly Phase Smart meters with installation, communication & integration	16441.31	168419	2769028988.89
3	Poly Phase HT current Smart Meter Consumer Meter	40499.49	206	8342894.94
4	Three phase LT-CT operated Smart Meter (inclusive of 97 nos. existing Solar/Net Consumer Meters)	20249.63	6053	122571010.4
5	LVCTO Smart Meters installation, communication & integration	20249.63	3398	68808242.74
6	CTPTO Smart Meters installation, communication & integration	40499.49	1255	50826859.95
7	CTPTO Smart DT Meters installation, communication & integration	104141.49	133	13850818.17
	TOTAL PART-A	**-**		**12957422153.04**
8	Supply and installation of Meter Boxes for DT check meters	2012.37	3398	6838033.26
9	Supply and installation of LT Compact CTs of LT CT Meters (3 CTs)	2515.37	6053	15225534.61
10	Supply and installation of LT CTs for DT metering (Ring Type)	2515.37	5610	14111225.7
	TOTAL PART-B	**-**		**36174793.57**
11	Architecture Specialists	251552.40	12	3018628.80
12	Security Specialists	226394.46	12	2716733.52
13	Integration Specialists	226394.46	12	2716733.52
14	Data Base Developer- Sr.	176084.32	24	4226023.68
15	Web/ Mobile Application Developer- Sr.	176084.32	24	4226023.68
16	Core Application Developer- Sr.	201239.56	24	4829749.44
17	Data Base Developer- Jr.	150929.08	36	5433446.88
18	Web/ Mobile Application Developer- Jr.	150929.0836	36	5433447.01
19	Core Application Developer- Jr.	150929.08	36	5433446.88
	TOTAL-C	**-**		**38034233.41**
	GRAND TOTAL (A+B+C)			**13031631180.02**
	GRAND TOTAL			**1303.16 Crore**

Note: 18% GST is included in the unit rate.

5.3 Phasing of the Project

Sr. No.	Item Description	Gross Rate Per Unit	FY 2023-24		FY 2024-25		FY 2025-26		TOTAL	
1	2	3	4	5	6	7	8	9	12	13
PART-A	**Supply, Installation, Integration, testing**		**QTY**	**Amt**	**QTY**	**Amt.**	**Qty**	**Amt.**	**Qty**	**Amt.**
	and commissioning of-		**Nos.**	**In Cr**	**Nos.**	**In Cr**	**Nos.**	**In Cr**	**Nos.**	**In Cr**
1	Single Phase whole current	11011.83	140311	154.51	598751	659.33	162150	178.56	901212	992.40
2	Three Phase whole current	16441.31	168419	276.90	0	0		0	168419	276.90
3	Three Phase HT current	40499.49	206	0.83	0	0		0	206	0.83
4	Three phase LT-CT operated	20249.63	6053	12.26	0	0		0	6053	12.26
5	Three phase LT-CT operated	20249.63	3398	6.88	0	0		0	3398	6.88
6	Three phase CT/PT operated	40499.49	1255	5.08	0	0		0	1255	5.080
7	Three phase CT/PT operated	104141.49	133	1.39	0	0		0	133	1.390
PART-B-Installation of DT Meters & Accessories										
8	Meter Boxes for DT meters	2012.37	3398	0.68	0	0		0	3398	0.680
9	LT Compact CTs of LT CT Meters (Set of 3 CTs)	2515.37	6053	1.53	0	0		0	6053	1.530
10	LT CTs for DT metering (Ring Type)	2515.37	5610	1.41	0	0		0	5610	1.410
PART-C_ Specialist Man Power										
11	Architecture Specialists	251552.40	12	0.30	0	0	0	0	12	0.300
12	Security Specialists	226394.46	12	0.27	0	0	0	0	12	0.270
13	Integration Specialists	226394.46	12	0.27	0	0	0	0	12	0.270
14	Data Base Developer- Sr.	176084.32	12	0.21	12	0.21		0	24	0.420
15	Web/ Mobile Application Developer- Sr.	176084.32	12	0.21	12	0.21		0	24	0.420
16	Core Application Developer- Sr.	201239.56	12	0.245	12	0.245		0	24	0.490
17	Data Base Developer- Jr.	150929.08	12	0.185	12	0.18	12	0.18	36	0.547
18	Web/ Mobile Application Developer- Jr.	150929.08	12	0.180	12	0.18	12	0.18	36	0.543
19	Core Application Developer- Jr.	150929.08	12	0.180	12	0.18	12	0.18	36	0.543
			319775	**463.52**	**598751**	**660.54**	**162150**	**179.10**	**1080676**	**1303.16**

A copy of Cost Sheet is enclosed as Annexure-G

5.4 Funding Mechanism:

A per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilise internal funds for executing all its Capex plans. However, BEST has decided to execute the project of "Implementation of Smart Metering& System Metering" under RDSS on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis. The detail funding arrangement, how it works is explained in the Business Model.

5.5 TOTEX (CAPEX + OPEX) Business Model

5.5.1 (i) As per Regulation 75.7 *"A Distribution Licensee may undertake Opex schemes for system automation, new technology and IT implementation, etc., and, such expenses may be allowed over and above normative O&M Expenses, subject to prudence check by the Commission: Provided that the Distribution Licensee shall submit detailed justification, cost benefit analysis of such schemes as against capex schemes, and savings in O&M expenses, if any"*

(ii) In the "Office Memorandum" of GoI dated 20th July, 2021, it is clearly mention that*"in order to attain the key objective of loss reduction in electricity distribution, the scheme envisages providing funding through Gross Budgetary support for the installation of pre-paid Smart Meters under TOTEX (CAPEX plus OPEX) pattern"*.

(iii) Accordingly, BEST has decided to execute the project of "Implementation of Smart Metering" under RDSS on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis. The scheme envisages providing funding through Gross Budgetary support for the installation of pre-paid Smart Meters under TOTEX (CAPEX plus OPEX) pattern". The project cost involves two major components: (i) Capital investment which involves cost of smart meters, meter boxes, Hardware & software, consumer indexing, training, installation, integration & commissioning of AMI solution etc. (ii) OPEX components which involves the cost for maintaining the system.

5.5.2 To execute the scheme under Revamped Distribution Sector Scheme (RDSS), BEST would have to comply (i) pre-qualification criteria set by the monitoring committee & (ii) result evaluation matrix. For availing the benefits under RDSS. BEST had submitted the Action plan &DPR for prepaid Smart Metring along with Loss Reduction works to the GoI costing Rs,708.54 Crs. however, the competent authority (Monitoring Committee) hasapproved the Action Plan & DPRs including prepaid Smart Meteringcosting Rs.659.17 Crs (against Rs.708.54 Crs), total GBS (15% on approved cost) Rs.98.88 Crs, incentive of Rs.47.82 Crs totalling Rs.146.69 Crs in the 13th meeting held on 28.10.2022 (kindly refer Annexure-B, Page No.10).

5.5.2.1 For achieving least cost of the material, BEST has followed up the procedure mentioned in CAPEX Regulation, 2022, APPENDIX-3(Guidelines for procurement of material). For appointing AMI-SP to "Implement Prepaid Smart Metering & System Metering" on BDFOOT basis, BEST advertised the tender in the local as well as all over Indiamedia.Initially, Notice of Inviting Tender was advertised for "appointment of

AMISP" under RDSS, but due to the poor response from bidders, multiple extensions were given to them. Finally, tender was opened for appointment of AMI-SP through open biddingprocesson Maha e-tender Portal on 21st July, 2022. After opening of the tender, it is observed that six bidders have taken part in the tender.However, thePricebid of only three eligible Tenderers has been opened. Tender evaluation is done on the basis of Reverse Auction process between the Eligible and Qualified Tenderers. Accordingly, the tender is awarded to M/s. ATL for Rs.1303.16 Crore.

5.5.3 In the OPEX base cost methodology, AMI-SP (ATL) has agreed to incur CAPEX during the build-up phase of 30 months and OPEX during Build-up and O&M phase i.e., total 120 months (10 years) from the date of execution of the contract. The payment due to the AMISP from AMI-IA shall be paid on monthly basis. Monthly cost is calculated as the total project cost spread over the actual recovery period, post integration of the meter. Accordingly, in this process BEST will pay to ATL on monthly basis for maximum 90 months. The payment to the AMISP shall commence only one after Operational Go-Live.

5.5.4 Considering the approved cost of Rs.659.17 Crs for replacement of 10,80,667 Nos. of meters, Competent Authority has approved GBSof Rs. 98.88 Crs, incentive of Rs.47.82 Crs, totalling Rs.146.69 Crs (as per RDSS Scheme GBS shall be 15% of the approved cost of metering including operational cost. Provided that it is not more than Rs.900 per meter for consumer metering). However, the cost arrived in the tender(i.e., 1303.16 Crs.) is on higher side than approved cost (Rs.659.17 Crs.).Therefore, as per RDSS guide lines BEST is eligible for getting GBS of Rs.98.88 Crs. for metering Scheme. While estimating the benefits, Grant amount of Rs.98.88 Crs. is deducted from the total payable amount of Rs.1303.16 Crs. Therefore, the benefits will be evaluated on balance payable amount of Rs. 1204.28 Crs. (Rs.1303.16 minus 98.88, = Rs.1204.28) is considered.***Please kindly note that incentive amount of Rs.47.82 Crs is not considered while calculating tariff impact and AMI-SP payments etc and same amount will be considered in ARR while filing the Petition for Truing up. BEST has proposed to install 10,80,676 Nos. of meters against approved10,80,667 Nos. of meters.***

5.5.5 While quoting in the tender, Adani Transmission Ltd (ATL) has not given bi-furcation between the costs of Capital items and O&M. ATL has quoted item wise for capital as well as O&M cost lum-sum. Further to this, ATL will transfer the assets at zero cost after completion of life of the meter as agreed by ATL. Thereafter, BEST will bear replacement cost of defective meters on actual basis and O&M cost of AMI system. **Payment to AMISP (M/s. ATL)by BEST shall be considered as Operational Expenditure on BEST's account.BEST has considered AMISP payment as operation expenditure while filing ARR and MTR petition.**The Assets will be in the books of Accounts of the ATL till the transfer of assets at the end of project at zero value.

5.5.6 Detail phasing of meters to be installed along with cost is to be incurred by AMISP during the build-up phase and Grant is given in the following table.

Sr. No.	Particulars	FY2023-24	FY2024-25	FY2025-26	Total
1	A	B	C	D	E=B+C+D
2	Approved cost	195.05	365.21	98.91	659.17
3	Meters to be Installed	3,19775	5,98,751	1,62,150	10,80,676
4	Total Cost (in Crs.)	463.52	660.54	179.10	1303.16
5	Grant	29.26	54.78	14.84	98.88
6	Balance Amount (4-5)	434.26	605.76	164.26	1204.28

Month wise implementation plan:

Month	FY	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15			**TOTAL**	FY-25-26		**TOTAL**
Target	**23-24**	1000	17429	18430	18430	44081	44081	44081	44081	44081	44081			**3.19.775**	M28	54049	**25-26**
Month		M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27		M29	54049	
Target	**24-25**	44081	44081	44081	44081	44084	54059	54059	54059	54059	54059	54059	54059	**5,98,751**	M30	54052	**1,62,150**

Detail calculation of phasing

	FY 23-24	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**	**FY 30-31**	**FY 31-32**	**TOTAL**
Build up phase Expenditure(in Crs.)	**463.52**	**660.54**	**179.10**	-	-	-	-	-	-	**1303.16**
Grant from GoI (PFC)	**29.26**	**54.78**	**14.84**	-						**98.88**
Phasing -AMISP Payment (without Grant)	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38	**1204.28**
Phasing -AMISP Payment (with Grant)	76.77	191.26	175.41	160.57	160.57	160.57	160.57	113.06	104.38	**1303.16**

FINANCIAL YEAR	**CAPEX**	**Grant**	**Month**	**CUMALATIVE QTY**	**RATIO**	**QTY**		**Phasing for AMISP disbursement**	**With Grant**	
23-24	160.57	29.26	12	319775	0.296	319775		47.51	76.77	
24-25	160.57	54.78	12	918526	0.850	598751		136.48	191.26	
25-26	160.57	14.84	12	1082676	1.00	162150		160.57	175.41	
26-27	**160.57**		12		1.000			**160.57**	160.57	
27-28	**160.57**		12		1.000			**160.57**	160.57	
28-29	**160.57**		12		1.000			**160.57**	160.57	
29-30	**160.57**		12		1.000			**160.57**	160.57	
30-31	**80.29**		6		1.000			**113.06**	113.06	
31-32	**0.00**				1.000			104.38	104.38	
32-33	0.00									
TOTAL	**1204.28**	**98-88**	**90**					**1204.28**	1303.16	
	1204.28	**1303.16**		**1080676**		1080676				

5.5.7 Impact on Tariff – 100% CAPEX mode (with Grant)

Scheme Name	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY 31-32
Phasing of approved DPR	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
IDC	-	-	-	-	-	-	-	-	-
Total capitalisation (incl. IDC)	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
GFA statement									
Opening balance	-	47.51	183.99	344.56	505.13	665.70	826.27	986.84	1099.90
Addition	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
Closing balance	47.51	183.99	344.56	505.13	665.70	826.27	986.84	1099.90	1204.28
Equity statement									
Opening balance	-	14.25	55.20	103.37	151.54	199.71	247.88	296.05	329.97
Addition	14.25	40.94	48.17	48.17	48.17	48.17	48.17	33.92	31.31
Closing balance	14.25	55.20	103.37	151.54	199.71	247.88	296.05	329.97	361.28
Revenue expenses									
Interest on debt	1.68	8.06	17.92	27.81	26.34	25.32	24.30	21.60	20.28
Return on Equity (@17.50%)	1.10	6.08	13.87	22.30	30.73	39.16	47.59	54.78	60.48
Depreciation (Avg. rate of 9%)	2.14	10.42	23.78	38.24	52.69	67.14	81.59	93.90	103.69
Running Expenses (@2.97% of av GFA)	0.71	3.44	7.85	12.62	17.39	22.16	26.92	30.99	34.22
Income Tax (@ 0% on grossed up RoE)	-	-	-	-	-	-	-	-	-
Total (Rs. Cr)	**5.63**	**27.99**	**63.43**	**100.97**	**127.15**	**153.78**	**180.41**	**201.27**	**218.67**
Projected Sales (MU)	4,756.54	4,780.33	4,804.23	4,828.25	4,852.39	4876.65	4901.04	4925.54	4950.17
Imp. per unit of sales (Rs./unit)	0.012	0.059	0.132	0.209	0.262	0.315	0.368	0.409	0.442

The above table indicates the likely impact on tariff over a period of nine years (FY2023-24 up to FY 2031-32) when grant from GoI is considered. It can be observed that the likely impact on tariff is Rs.0.012 per unit in 2023-24 moving to Rs 0.442 per unit in 2031-32.

If the scheme is executed under OPEX, tariff impact with Grant for entire contract period is as shown below.

Total metering Scheme is considered under OPEX Plan, impact on Tariff is as shown below:												
DPR Description / DPR No.	**OPEX without Grant (Rs. Cr)**	**OPEX with Grant (Rs. Cr)**	**Grant (Rs. Crs)**	**FY 23-24**	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**	**FY 30-31**	**FY 31-32**
Smart Metering / AMI (Rs. Crs)	1303.16	1204.28	98.88	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
Sales Units (in Mus)				4756.54	4780.33	4804.23	4828.25	4852.39	4876.65	4901.04	4925.54	4950.17
Impact on Tariff due to OPEX Scheme (in Rs.)				**0.100**	**0.286**	**0.334**	**0.333**	**0.331**	**0.329**	**0.328**	**0.23**	**0.211**

6. Cost Benefit Analysis (CBA)

The benefits of capital expenditure proposed to be incurred under this Scheme may be divided into two parts; namely- Tangible benefits which can be expressed in monetary terms and Intangible benefits are more qualitative in nature.

The expense heads under this scheme contain both developmental costs i.e., those cost incurred on pre-paid smart metering along with necessary Hardware & Software and non-developmental costs i.e., those cost incurred for maintenance of the system. Both expenses do not directly contribute to increase in the sale units. However, these expenses too are necessary for giving better service to the consumers through accurate energy measurement and billing to the consumers.

The deployment of smart metering with related infrastructure, through its ability of remote communication and data analytics, is expected tolead to many benefits for the end consumers which are listed in Para 6.1.1 under Customer Benefits. The reduction in O&M expenditure will be a step in the direction of meeting thenormative O&M expenditure as allowed from time to time in the respective tariff Orders /Regulations.

6.1 Tangible benefits due to smart metering /AMI Scheme:

The project aims to harness the capability of AMI/Smart Metering System for the benefit of BEST customers. Major benefits expected from this project are-

6.1.1 Customer Benefits

I. Improved billing accuracy

The smart meters are capable of communicating. This facility enables the system toget billing data on predefined intervals over the air. Hence the human interference iscompletely eliminated as far as meter data acquisition is concerned. Automatic data acquisition also eliminates the need to physically visit the premises to inspect the connection.

II Improved service restoration

At present consumers informs about off supply to control room of BEST. BEST deploys the crews depends on single consumer offsupply or area off supply in case of multiple complaints. Once the complete AMI system is in place, it is easier to pinpoint the location wherethe off supply / fault has occurred. Pro-active action canbe taken in cases where meter is not communicating, in such cases utility can take decision and send the maintenance staff to that particular location.

III Higher reliability of the system

The alerts triggered from field conditions such astemperature, high threshold values etc. enables the utility to take proactive actions. This reduces the probability of fault or breakdown occurrence.

IV Availability of information and online services

AMI enables two-way communication system in which lots of data and informationcan be captured from field devices like smart meters, distribution automation points,street light points, etc. The data retrieval frequency can also be set which can varyfrom as low as some minutes to daily. The consumer can view the consumptioncharges corresponding to his consumption, through consumer portal. BEST hasalready developed the consumer portal and is in the process of integrating it with the mobile App “MI BEST” and the website www.bestundertaking.com. Consumers can view their consumption charges at any time by logging on to thewebsite or by downloading the mobile App. Hence consumers can use and analysetheir consumption pattern and find ways to optimize the same as to reduce their electricity charges.

6.1.2 Utility Benefits

I Elimination of manual meter reading

Timely meter reading and billing is always critical for any utility across the world. Lot of intermediate processes are involved in metering like scheduling the meter reads, maintaining the reading cycle and sequence, uploading the batch files in the CMRI, physical movement, meter downloading, uploading the data into the PC and then to servers, running the logics to identify the billing data abnormalities, bill preparation etc. Many of these intermediate steps will be eliminated by automatic meter data downloading.

II Improved billing and billing accuracy

Less human intervention means reduced possibility of errors. Automatic data retrieval will ensure more accurate bills. The system also enables to get on demandmeter reading. Issues like in accessibility of meter reads like consumer not available, house lock, delayed billing cycle etc. can also be addressed. Thus, the revenue leakage and non-billing issues are arrested.

III Outage management and real time data

As mentioned in the reliability section above, it is easier to identify the faults and locate the mona GIS map. Outages can be located quickly and concerned maintenance staff can reach the location in lesser time. This also helps the utility to optimally manage the distribution network. Predefined threshold values and real time data sensor data enables to take quick and proactive decisions.

IV Work and asset management

Online availability of data enables to monitor the network real-time. Asset conditions and health can be monitored on line and records are easy to maintain and retrieve. Any work created or generated can be transferred to concerned staff on the Tab or smart phone. This reduces time in registering a request and its allocation. Once the job is complete, the feedback and status update can easily be entered from the field itself.

V. Smart meters will enable BEST to remotely connect or disconnect consumers, thereby reducing the field visits required by connection or disconnection personnel. Smart Meters Deployment Strategy.

VI. In the existing billing system, about 3% meters are not read due to various reasons like meters faulty, key not available etc. The revenue can be increased by installing smart meters which can be read remotely.

VII. Billing data is to be made available by AMI-SP during the entire project period. Hence, the cost to be incurred on the meter readers will be eliminated. It will help to reduce the administrative cost.

APPENDIX-1:

1. Part1:

1.1.	**Name of Applicant**: BEST (Brihanmumbai Electric Supply & Transport undertaking)
1.2.	**Name of the Capital Investment Work**: Implementation of Prepaid Smart Metering Project under RDSS.
1.3.	**Nature of Opex Scheme (New):** New DPR Scheme on "Implementation of Prepaid Smart Metering" is submitted as per MERC (Approval of Capital Investment Schemes) Regulations, 2022.
1.4.	**Details of the Location**: Mumbai circle (BEST's Licensee Area)
1.6.	**Date of Approval by Competent Authority designated by the Board of Directors of the Company**: *A copy of management approval for RDSS Scheme including "Implementation of Prepaid Smart Metering" is enclosed as* ***Annexure-H.***
1.7.	**Category of DPR**: This DPR Scheme falls under Regulation 3.9 & 3.11of MERC (Approval of Capital Investment Schemes)Regulations,2022. Category are as follows: 3.9 (a) Infrastructure required for releasing new supply connections. (i) Improvement in quality of supply & reliability of distribution system. (l) Installation or Upgradation of communication and/or control equipments. (n) All metering Schemes (o) Improvement in consumer services. 3.11Implementation of Smart Meters.
1.8.	**Objective of the Capital Investment:** To adopt technological advancements in energy metering to achieve Reduction in loss, for accurate measurement of energy, to provide improved service to consumers, Improved billing and billing accuracy, Higher reliability of the system, availability of information and online services, Outage management and real time data, Work and asset management,to release new supply and to replace existing meters. The project aims to harness the capability of AMI / Smart Metering system for the benefit of BEST customers. Major benefits expected from this project are improved service restoration.
1.9.	**Need of Analysis**: As per CEA Regulations dated 17.03.2006, on Metering systems emphasising on the need to use Smart Meters. ***A Copy of CEA Regulations, dated 17.03.2006 is enclosed as Annexure-'I'.*** As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulations, 2021 (Regulation No. 15), *"all the new connections shall be released with the Smart Meter having at least the facility of remote reading and all the existing meters whenever replaced shall be replaced only by Smart Meters having at least the facility of remote reading".* As per Ministry of Power, Notification dated 17thAugust, 2021 *"all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Pre-payment Mode conforming to relevant IS, within the time".* ***A Copy of MERC (ESC &SoP including Power Quality) Regulations, 2021 and MoP Notification, 2021 is enclosed as Annexure-'F'.***
1.10	**List of Identical schemes previously approved by the Commission and their progress report (5years data):**First timeBEST has planned to replace all existing meters with Smart Meters. Hence, no previous records of Smart meters Implementation Schemes.
1.11.	**State Map showing Location of the Scheme (for Transmission)**- Not Applicable
1.12.	**Brief scope and specification of work**: 1. Single Phase Meter-WC- Consumer Meter (Qty. 9,01,212 Nos.) 2. Three Phase Meter-WC- Consumer Meter (Qty. 1,68,419 Nos.) 3. Three Phase Meter-LTCT- Consumer Meter (Qty. 6,053 Nos.) 4. Three Phase Meter-LTCT-DT Meter(Qty. 3398 Nos.)

	5. Three Phase Meter- HT ConsumerMeters(Qty. 206 Nos.) 6. Three Phase Meter –HT Feeder Meter (Qty. 1255 Nos.) 7. Three Phase Meter-CT/PT Operated -ABT Meter (Qty. 133 Nos.) ***A copy of relevant Specification of above items is enclosed as Annexure-J***
1.13.	**Any Reference of Study Report / recommendation of OEM/Expert:** N.A for this DPR.
1.14.	**Estimated Cost**: Rs.1303.16 Crs. (FY 2023-24–463.52 Crs., FY 2024-25–660.54 Crsand FY 2025-26- 179.10 Crs) IDC is not included in the costing. ***A copy of Cost Sheet enclosed as Annexure-G.***
1.15.	**Time Frame of the expenditure:** Project completion Period 30 months.

Financial Year	Capex Expenditure (in Rs.)	Capitalisation (in Rs.)
2023-24	463,52,10,928.90	463,52,10,928.90
2024-25	660,54,18,569.61	660,54,18,569.61
2025-26	179,10,01,681.38	179,10,01,681.38
TOTAL	**1303,16,31,179.89**	**1303,16,31,179.89**

1.16. **Funding arrangement: For FY2023-24toFY 2031-32 (for 9 years from the date of contract).**

Sources of Funds	**Amount (in Crs.)**	**Share (%)**
Debt	1204.28	92.41
Equity	-	-
Grant	98.88	7.59
Consumer Contribution/Deposit Works	-	-
Total	**1303.16**	**100**

Please kindly note that the project of Smart Metering is to be executed under RDSS on DBFOOT basis. The payment due to the AMISP from AMI-IA (BEST)shall be paid on monthly basis. Monthly cost is calculated as the total project spread over the actual recovery period, post integration of the meter. Accordingly, BEST will pay AMI-SP on monthly basis for period of maximum 90 months. The payment to the AMISP commence from only one after Operational Go-Live. The Grant is 7.59% of tender cost and 15% of PFC approved cost of Rs.659.17 Crs.

1.17 **Benefits/Impact**:

The decision of new connection and replacement of existing meters with Smart Meters is taken with the following objectives:

- By connecting new meters to release new load will increase revenue of BEST.
- Improved billing Accuracy.
- Improved Service restoration.
- Higher reliability of the system.
- Availability of information and online services.
- Elimination of manual meter reading.
- Improved Billing and Billing Accuracy.
- Outage Management and real time data.
- Work and Asset Management.
- Remotely Connect and Dis-connect the meters

For comparative purpose, impact on tariff by considering 100% CAPEX Scheme and 100% OPEX Scheme is given below:

F Y	23-24	24-25	25-26	26-27	27-28	28-29	29-31	30-31	31-32
#	0.012	0.059	0.132	0.209	0.262	0.315	0.368	0.409	0.442
&	0.100	0.286	0.334	0.333	0.331	0.329	0.328	0.23	0.211

#- 100% CAPEX Scheme -Impact on Tariff Rs. Per Unit $-100% OPEX Scheme -Impact on Tariff Rs. Per Unit

1.18.	**Overall Cost-benefit Analysis**: **For CAPEX Scheme** FY2023-24, tariff impact will be 0.012 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.059 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.132 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.209 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.262 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.315 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.368 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.409 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.442 against Opex Cost of ₹104.38 Crs. . **ForOPEX Scheme** FY2023-24, tariff impact will be 0.100 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.286 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.334 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.333 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.331 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.329 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.328 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.230 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.211 against Opex Cost of ₹104.38 Crs. Comparison of capital cost & corresponding tariff impact with above benefits, a copy of Cost Benefit Analysis is enclosed as ***Annexure-K***.

2. PART-II:

2.1	**Need of the investment**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' need the efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas to concentrate by governments for the development of country. As per CEA Regulations dated 17.03.2006, on Metering systems emphasising on the need to use Smart meters. ***A Copy of CEA Regulations, dated 17.03.2006 is enclosed as Annexure-'H'.*** ***Vide*** MoP notification dated 17th August, 2021, GoI prioritised for all DISCOMS including BEST that "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Prepayment Mode***. A Copy of MERC (Electric Supply Code & SoP including Power Quality) Regulations, 2021 and MoP Notification, 2021 is enclosed as Annexure-'F'.*** **Demand side requirement**: There is addition of new consumers due to development of Coastal Road, Mill and SRA Schemes, EV Charging, Sewree bridge, Redevelopment of Plots etc. In order to meet the requirement of new Consumers for releasing new Load, Smart Meters are required installed. • Reduction in loss, • for accurate measurement of energy, • to provide improved service to the consumers, • to release new supply, • to replace conventional/Static meters, • to replace defective meters
2.2	**Time lines of the Project:** Project shall be completed within Period 30 months from the date of contract. Adani Transmission Ltd (ATL) has agreed to incur Capital Expenditure (CAPEX) during the build-up phase of 30 months from the date of contract and OPEX during O&M phase for remaining 90 months i.e., total 120 months.The work will be commenced from the date of the contract period . Letter of Award (LoA) is issued to M/s. ATL. For execution of project contract with ATL is being initiated. **On the following basis priority is decided**: As per "MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulations, 2021 (Regulation No. 15)", all the new connections shall be released with the Smart Meter having at least the facility of remote reading and all the existing meters whenever replaced shall be replaced only by Smart Meters having at least the facility of remote reading. As per Ministry of Power, Notification dated 17th August, 2021 "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Pre-payment Mode conforming to relevant IS, within the time". ***A Copy of MERC (ESC & SoP including Power Quality) Regulations, 2021 and MoP Notification, 2021 is enclosed as Annexure-'F'.*** There is no possibility of deferring the investment. In 1st phase (1st Year) HT, CT-PT operated, LT-CT operated (including feeder meters) meters are taken for replacement and balance meters will be replaced in 2nd phase (2nd year).

2.3	**Scheme for revised approval/scope/cost**: This Scheme is New One and is submitted as per MERC (Approval of Capital Investment Schemes), Regulations 2022.
2.4	**Proposed Capital Investment Scheme**: In this DPR, capital investment is proposed to be executed as per MERC (Approval of Capital Investment Schemes) Regulations 2022, Clause No. 3.11 under TOTEX (Capex +Opex) Model. BEST has proposed to execute the said scheme under OPEX Mode.
2.5	**Technical Justification**: As per Electricity Act 2003, every new connection is required to be released after installing a correct meter for accurate Energy measurement. The Characteristics of the Energy Meters to be procured for new connections will conform relevant IS and Central Electricity Authority Regulations, 2006. ***A Copy of CEA Regulations, dated 17.03.2006 is enclosed as Annexure-'I'.*** (i)Every new connection is required to be released after installing a meter as per the Electricity Act, 2003. BEST has proposed installation of smart meters in this DPR during FY 23-24, FY 2024-25& FY 2025-26. (ii) As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulation. 2021 and Electricity (Rights of Consumers) Rules, 2020, all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading: further to that all the existing meters whenever replaced shall be replaced only by Smart Meter or Meter having at least the facility of remote reading. (iii)The characteristics of meters to be procured for new connections will confirm to the Central Electricity Authority (Installation and Operation of Meters)Regulation,2006. (iv) As per MoP, Notification dated 17th August, 2021 "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with Smart meters working in Prepayment Mode conforming to relevant IS, within the time" Accordingly, BEST have decided to replace all existing Energy Meters with Smart Meters working with Prepayment Mode. ***A copy of MERC (Electric Supply Code and SoP) Regulation, 2021 &MoP2021 Notification is enclosed as Annexure- 'F'.*** In line with the above technical requirements, BEST has prepared this Detailed Project Report (DPR) to replace existing Static and conventional meters with Smart meters for all consumers, along with setting up the backbone communications infrastructure and related IT systems. The communication backbone facilitates the acquisition of data from smart meters and brings it to central server. The IT/OT software installed in the server takes care of the huge data collected from the field. This data is then shared with other applications like billing, GIS, SCADA etc. and generated reports. Looking at the consumer base of more than 10 lakhs, BEST has planned to replace existing meters with smart meters.
2.6	**Financial Justification:** **TOTEX (CAPEX + OPEX) Business Model**

	(i) The scheme envisages providing funding through Gross Budgetary support for the installation of prepaid Smart Meters under TOTEX (CAPEX plus OPEX) pattern". The project cost involves two major components: (i) Capital investment which involves cost of smart meters, meter boxes, Hardware & software, installation, integration & commissioning of AMI solution, consumer indexing, training etc. (ii) OPEX components which involves the cost for maintaining the system. (ii) The complete scheme is to be executed under OPEX Mode. In the OPEX base cost methodology, Adani Transmission Ltd (ATL) has agreed to incur CAPEX during the build-up phase of 30 months from the date of contract and OPEX during O&M phase for balance period of 90 months i.e., total 120 months. The monthly cost is calculated as the total project cost spread over the actual recovery period, post integration of the meter. Accordingly, in this process BEST will pay to ATL on monthly basis for maximum 90 months. The payment to AMISP will start after the project goes live. (iii) While quoting in the tender, Adani Transmission Ltd (ATL) has not given bifurcation between the costs of Capital items and O&M. The Assets will be in the books of Accounts of the ATL till the transfer of assets at the end of project at zero value. • The new Smart Meters used for releasing new load will increase the revenue. • In accurate metering of energy consumption would lead to loss in revenue. By replacing faulty / conventional meters will reduce revenue losses resulting increase in revenue. • Replacement of all existing meters (Electronic/Conventional) with Smart Meters. Old assets (existing meters) will be scrapped.
2.7	**Consent of M-DNAC**: As per Electricity Act, 2003, Clause, 42(3), BEST undertaking being a local authority, hence exempted from open Access.
2.8	**Plan of other Transmission Licensees / CTU**: DPR is related to Distribution Licensees, hence Not Applicable.
2.9	**Phasing of Investment (The investment is done by ATL on DBFOOT basis)** :
2.10	**Statutory/Safety Requirement: N.A**

Table for 2.9:

Financial Year	Capex Expenditure (in Rs. Crore)	Capitalisation (in Rs. Crore)
2023-24	463.52	463.52
2024-25	660.54	660.54
2025-26	179.10	179.10
TOTAL	**1303.16**	**1303.16**

This capital expenditure and Capitalisation is shown for information purpose, otherwise the scheme is to be executed in OPEX Mode.

2.11	**Cost Assessment /Cost Break-up**: **Item wise costing** Item wise pert unit cost, Qty and total cost is given in the following table

Particulars	Unit Cost Gross (in ₹)	Qty (in Nos.)	Cost (in ₹)
Single Phase Smart meters with installation, communication & integration	11011.83	901212	9923993337.96
Poly Phase Smart meters with installation, communication & integration	16441.31	168419	2769028988.89
Poly Phase HT current Smart Meter Consumer Meter	40499.49	206	8342894.94
Three phase LT-CT operated Smart Meter (inclusive of 97 nos. existing Solar/Net Consumer Meters)	20249.63	6053	122571010.39
LVCTO Smart Meters installation, communication & integration	20249.63	3398	68808242.74
CTPTO Smart Meters installation, communication & integration	40499.49	1255	50826859.95
CTPTO Smart DT Meters installation, communication & integration	104141.49	133	13850818.17
TOTAL PART-A	**-**		**12957422153.04**
Supply and installation of Meter Boxes for DT check meters	2012.37	3398	6838033.26
Supply and installation of LT Compact CTs of LT CT Meters (3 CTs)	2515.37	6053	15225534.61
Supply and installation of LT CTs for DT metering (Ring Type)	2515.37	5610	14111225.70
TOTAL PART-B	**-**		**36174793.57**
Architecture Specialists	251552.40	12	3018628.80
Security Specialists	226394.46	12	2716733.52
Integration Specialists	226394.46	12	2716733.52
Data Base Developer- Sr.	176084.32	24	4226023.68
Web/ Mobile Application Developer- Sr.	176084.32	24	4226023.68
Core Application Developer- Sr.	201239.56	24	4829749.44
Data Base Developer- Jr.	150929.08	36	5433446.88
Web/ Mobile Application Developer- Jr.	150929.08	36	5433446.88
Core Application Developer- Jr.	150929.08	36	5433446.88
TOTAL-C	**-**		**38034233.28**
GRAND TOTAL (A+B+C)		**13031631179.89**	
GRAND TOTAL	**13031631179.89**		

Note: 18% GST is included in the unit rate.

As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022, BEST was invited and finalised tender to appoint AMI-SP for "Implementation of Prepaid Smart Metering Project" with a transparent, competitive, fair and reasonable procedure. Subsequently, ***a copy of a Letter of Award (LoA) has been issued to M/s ATL which is enclosed as Annexure-D.*** Accordingly, cost sheet is prepared by considering Unit rates for each item from issued LoA. For detail item wise calculation, a separate Excel Sheet is enclosed ***as Annexure-G.***

2.12	**Least Cost analysis /Alternatives**:

Proposal to "Implement Prepaid Smart Metering" ***A Letter of Award (LoA) has been issued to M/s ATL is enclosed as Annexure-A.***

1. As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations,2022 BEST was invited and finalised tender to appoint AMI-SP for "Implementation of Prepaid Smart Metering Project" with a transparent, competitive, fair and reasonable procedure.

2. Accordingly, the unit cost is derived from the open tender invited by advertising and following up the procure mentioned in Apendix-3. The order was placed on the technical suitable and LAO.

3. A tender was opened on 21.07.2022 for appointment of AMI-SP for "Implementation of Prepaid Smart Metering" through open bidding process on Maha e-tender Portal. BEST undertaking advertised the tender in the local as well as all over India media. Initially, Notice of Inviting Tender was advertised for "appointment of full turnkey contractor (AMI-SP) to execute the project. Due to the poor response from the bidders, multiple extensions were given. Finally, tender was opened on 21st July, 2022. After opening of the tender, it is observed that six bidders have taken part in the bidding process and it has been observed that the rates quoted by the firms, particularly towards the execution of Prepaid smart metering project.

4. Details of offers received for appointment of AMISP:

In tender document it has been clearly mentioned that the tender awarding shall be done on the basis of Reverse Auction Process (RAP) between the Eligible and

Qualified Tenderers to appoint AMI-SP for implementation of Smart metering Pre-payment system Project. In the said tender, six bidders have taken part. Out of Six Tenderers, Price bid of the three eligible Tenderers has been opened and same is given in the following table.

Bidder No.	Tenderers	Gross Rate Including GST tax. (inRs.)	Rank
1	M/s. Fluentgrid Pvt Ltd.	1559,99,75,299.00	3
2	M/s. Adani Transmission Ltd. (ATL)	1528,26,00,331.34	2
3	M/S. AshokaBuildcon Ltd.	1313,16,31,179.89	1 (LAO)

As per above, offer of the Bidder No. 3 was Lowest, however, in the reverse option, bidder 2 has matched their rates the LAO and further reducing the Cost by 10 Crore at price of Rs. 1303.16 Crore M/s. ATL succeed to won the Tender. This type of Tender/contract is being awarded for the first time in the BEST Undertaking.

Accordingly, for cost estimation purpose, the following cost arrived through this tender is considered.

(In Rs. Crs)

Sr. No.	Bidder No.	Basic Cost	Total Tax 18%	Gross Cost
1	2	11,04.37	1,98.78	13,03.16

A Letter of Award (LoA) has been issued to M/s ATL and copy of the same is enclosed as Annexure-D.

In view of above, least cost is achieved.

2.13	**If not and if Deferred Analysis**: For this case not applicable.
2.14	**Overall Cost-benefit Analysis**: Release of new load, improved billing accuracy, elimination of manual meter reading, consumer satisfaction etc. **For CAPEX Scheme** FY2023-24, tariff impact will be 0.012 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.059 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.132 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.209 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.262 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.315 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.368 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.409 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.442 against Opex Cost of ₹104.38 Crs. . **For OPEX Scheme** FY2023-24, tariff impact will be 0.100 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.286 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.334 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.333 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.331 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.329 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.328 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.230 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.211 against Opex Cost of ₹104.38 Crs. Comparison of capital cost & corresponding tariff impact with above benefits, a copy of Cost Benefit Analysis is enclosed as ***Annexure-K.***
2.15	**Methodology of Put to use of the asset and computing Percentage utilization of Project**: Following methodology of put to use of the Asset is used. 1. During the Financial Year (April to March), when the capital investment made on procurement of Energy Meters and his accessories is considered as Capital Expenditure made during that year. 2. When the meters are installed on site i.e. put to use, then the asset is capitalised.
2.16	**Constraints:** Performance of any Electric distribution utility is measured over following crucial Parameters. • Cost of supply including T&D loss • Customer services

	• Management of demand curve – supply reliability • Electricity supply quality In the current dynamic scenario where consumers are installing roof top solar systems, updated their vision and have added following vision statements: • Active participation of consumers in managing load curve • Integration of distributed generation, batteries etc. • Faster information to consumers • Self-healing system • Optimum utilization of asset and resources Presently, BEST is not having AMI infrastructure. The mission of BEST undertaking is to provide economical, reliable and quality electricity supply to all consumers connected to its network. Though BEST's present network has static and few Electro-mechanical meters in the system. The key challenges are to ensure that: • Data/ information are communicated back at desired frequency in desired formats • All desired information/ data/ events are generated • All data/ information is processed • All data/ information is analyzed to meet company objectives and for routine operations • Smart actions are taken based on data/ information analytics • Customer Inclusion is achieved • Asset optimization and operational efficiency • There is improvement in Power Quality
2.17	**Inclusion in STU Plan/License for Transmission Projects. Recommendation of the Transmission Planning Committee as provided in the Grid Code:** This is not applicable to this DPR.
2.18	**Works intended for adaptation of latest Technology/Improvement/Up gradation of Existing Infrastructure:** As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulation. 2021, Electricity (Rights of Consumers) Rules, 2020 and MoP Notification, it is made mandatory that all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading: further to that all the existing meters shall be replaced only by prepaid Smart Meter or Meter having at least the facility of remote reading. Accordingly, to implement above said regulations, BEST has prepared this Detailed Project Report (DPR) to release new connections with smart meters and also to replace all existing meters with smart meters for all consumers, along with setting up the backbone communications infrastructure and related IT systems. The communication backbone facilitates the acquisition of data from smart meters and brings it to central server. The IT/OT software installed in the server takes care of the huge data collected from the field. This data is then shared with other applications like billing, GIS, SCADA etc. and generated reports. Looking at the consumer base of more than 10 lakhs, BEST has planned to replace existing meters with smart meters.

2.19	**Upstream/Downstream arrangement:** For this DPR such arrangement is not applicable.
2.20	**Statutory Clearances and Project Layout: S**ince, smart meters are to be installed in the meter cabins which are constructed by the developer while constructing the building and in the existing meter cabins. Hence, there is no need of statutory clearances required from any other authority for this project.
2.21	**Detailed Survey**: For this project detail survey is not needed.
2.22	**Past Trend and Future projection**: First time, BEST has planned to replace all existing meters with Smart Meters by appointing AMI-SP,due to this past trend is N.A. **Future projection**: While awarding the tender to M/s ATL for implementation of Smart meter project, care is already taken.

2.23 **Detailed Justification for quantity proposed:**

Indicative list of meters to be replaced with Smart Meters

Sr. No.	Meter Type	Quantity (in Nos.)
1	Single Phase *Smart Meter-WC	901212
2	Three Phase Smart Meter-WC	168419
3	Three Phase SmartMeter-LTCT	6053
4	Three Phase SmartMeter-LTCT DT Meter	3398
5	Three PhaseSmart Meter- HT Meters	206
6	Three Phase Smart Meter –HT Feeder Meter	1255
7	Three Phase Smart Meter-CT/PT Operated ABT Meter	133
	GRAND TOTAL	**10,80,676**

Please kindly note that smart meter quantity includes net meters.

(a) Justification for quantity proposed:

At present BEST having10,46,617 meters in the system, hence out of 10,80,676 meters 10,46,617 consumers meters, 133 ABT meters, 1255 feeder meters, 3398 DT meters and balance 29,273 meters for new connections are proposed.

2.24 **Check list of the documents appended:**

1. DPR in the MERC Format for FY2023-24 to FY2025-26 (Pg. No.1-24)
2. Pat-I and Part-II Filled Formats of Capital Investment Scheme for MERC Approval (Pg.No.25-36)
3. Annexure-A: - A Letter of MoP dated 20.07.2021 (Pg. No.37-56)
4. Annexure-B: -A copy of BEST's Letter & approval from PFC (Pg. No.57-87)
5. Annexure-C:- Guidelines if RDSS Scheme (Pg. No.88-143)
6. Annexure-D:- A Letter of ward of contract M/s ATL (Pg No. 144-162)
7. Annexure-E: - Detail scope of work. (Pg. No. 163-169)
8. Annexure-F:- MERC (ESC & SoP Regulation, 2021 and Mop Notification, 2021 (Pg. No.170-174)
9. Annexure-G: - Detail cost sheet (Pg. No 175-175)
10. Annexure-H:-A copy of Management Approval for RDSS (BCR) (Pg. No. 176-200)
11. Annexure -I:- A Copy of CEA Regulations, dated 17.03.2006.(Pg.No.201-203)
12. Annexure - J:-Specification of various items. (Pg. No. 204-355)
13. Annexure-K :- Cost benefit Analysis & Calculation Sheet (Pg.No.356-361)
14. Annexure-L:- Guidelines for procurement of materials (Pg. No.362-389)
15. Annexure-M:-Procedure for Scrapping (Pg. No .390-396)
16. Annexure –N: -Depreciation Schedule (Pg. No. 397-400)

Annexure-A

F. No. 20/9/2019-IPDS
Government of India
Ministry of Power
Shram Shakti Bhavan, Rafi Marg, New Delhi-110001

Dated, 20th July, 2021

To

1. Chief Secretary of all States and UTs
2. Additional Chief Secretary Principal Secretary/Secretary (Energy/Power) of all States and UTs
3. CMDs/MDs of State Power Distribution Utilities
4. CMD, REC Ltd.
5. CMD, Power Finance Corporation Ltd.

Subject: Revamped Distribution Sector Scheme: A Reforms-Based and Results-Linked Scheme.

Sir,

I am directed to forward herewith Office Memorandum of the Revamped Distribution Sector Scheme - A Reforms-Based and Results-Linked Scheme.

Enel: As above

Yours faithfully,

Srikanth

(M. Srikanth Reddy)
Deputy Director (UR&SI-II)
Tel:011-23319108
Email: srikanthreddy@nic.in

Copy to:

1. The CEO, NITI Aayog, Sansad Marg, New Delhi.
2. Secretary, Ministry of Finance, Department of Expenditure, North Block, New Delhi.
3. Secretary, Ministry of Home Affairs, North Block, New Delhi.
4. Secretary, Ministry of Electronics and IT, CGO Complex, New Delhi.
5. Secretary, Ministry of New & Renewable Energy, CGO Complex, New Delhi.
6. Prime Minister's Office (Shri Rohit Yadav, Joint Secretary), South Block, New Delhi.
7. Cabinet Secretariat (Shri Ashutosh Jindal, Joint Secretary), Rashtrapati Bhawan, New Delhi.
8. Cabinet Secretariat (Shri S.G.P. Verghese, Director), Rashtrapati Bhawan, New Delhi **with reference to their OM No. CCEA/11/2021(i) dated 02nd July, 2021.**
9. Chairperson, CEA, New Delhi
10. CMD, PGCIL
11. DG, Bureau of Energy Efficiency
12. Director, NPMU, NSGM

—2/-

13. Budget Section/Finance Division, Ministry of Power
14. Controller of Accounts, SevaBhavan, R.K. Puram, New Delhi.
15. Principal Director of Audit, Infrastructure, New Delhi

Copy also to, for information:

(i) PS to Hon'ble Minister of Power
(ii) PS to Hon'ble Minister of State for Power
(iii) Sr. PPS to Secretary (Power).
(iv) PPS to AS(Distribution)/PPS to AS&FA, Ministry of Power
(v) PPS to JS(Distribution/Hydro)/JS(R&R and OM)/JS(Trans./IT), Ministry of Power
(vi) PPS to Director(UR&SI)/ PS to Director(DS), Ministry of Power

F. No. 20/9/2019-IPDS
Government of India
Ministry of Power
Shram Shakti Bhawan, Rafi Marg, New Delhi-110001

Dated, 20th July, 2021

OFFICE MEMORANDUM

Subject: Revamped Distribution Sector Scheme: A Reforms based and Results linked Scheme.

Sanction of the President is conveyed for the implementation of "**Revamped Distribution Sector Scheme - A Reforms based and Results linked Scheme**" with the objective of improving the quality and reliability of power supply to consumers through a financially sustainable and operationally efficient distribution Sector. The Scheme aims to reduce the AT&C losses to pan-India levels of 12-15% and ACS-ARR gap to zero by 2024-25.

2. The Scheme has an outlay of Rs.3,03,758 crore with an estimated gross budgetary support of Rs.97,631 crore from the Government of India.

3. The ongoing approved projects under the Schemes of IPDS, DDUGJY along with PMDP-2015 for the erstwhile State of Jammu & Kashmir would be subsumed in this Scheme and the savings of the associated GBS (Gross Budgetary Support) of approx. Rs. 17000 crore would be part of the total outlay of the Revamped Distribution Sector Scheme under the existing terms and conditions till their sunset on 31" March, 2022. The funds under these Schemes would be available for the approved ongoing projects under Prime Ministers Development Program (PMDP) for the erstwhile state of J&K launched in 2015 (under IPDS and DDUGJY) and of Ayodhya, Uttar Pradesh (under IPDS) till 31 March, 2023.

4. Scope of Scheme :

4.1 The Scheme has two parts: **Part 'A'** – Financial support for upgradation of the Distribution Infrastructure and Prepaid Smart Metering & System Metering and **Part 'B'** – Training & Capacity Building and other Enabling & Supporting Activities. The details are enclosed at **Annexure – I (Page: 9-10).**

PART 'A'

4.2 To avail funding under this part, an eligible DISCOM is required to prepare an Action plan for strengthening their distribution system and improving its performance by way of various reform measures, which would result in improvement in their operational efficiency and financial viability as well as improve the quality and reliability of power supply to the consumers. DISCOMs will have the flexibility to draw up their Action plans keeping in view their own context. However, a DISCOM which is making losses will not be able to access funds under this Scheme unless it draws up a plan to reduce the losses, lists out the steps it will take to reduce such losses and the calendar thereof, get their State Government's approval to it, and file it with the Central Government. There will be a prequalification criteria in terms of compliance with best management practices; such as publication of audited accounts on time, not creating Regulatory Assets, accounting and payment of payable subsidy in accordance with Section 65 of the Electricity Act etc. The funding for the works (other than prepaid Smart Metering, Distribution Transformer Metering and Feeder Metering including integration of existing Metering infrastructure) would be contingent upon DISCOMs clearing the pre-qualifying criteria and taking steps in accordance with the loss reduction plan.

4.3 Each DISCOM will prepare an Action Plan, with subcomponents for strengthening its Distribution system , and to improve their performance . The Action Plan will have two parts. The first part will include an analysis of the reasons/root cause for losses, and list out the steps which are required and proposed for reduction of losses and ACS-ARR gap and the time taken for taking these steps. DISCOM will specify the activities and reforms proposed to improve their performance. These activities and reform measures will be finalized on basis of its operational and financial data and will be worked out to address DISCOM-specific problems. An indicative list of reforms/activities is enclosed at **Annexure – II (Page: 11).**

4.4 There shall be a Results Evaluation Framework which shall be finalized by the Monitoring Committee in respect of each DISCOM after incorporating result parameters and trajectories. It would have two components (i) Pre-qualifying criteria; and (ii) Result Evaluation Matrix. The pre-qualifying criteria need to be mandatorily met with by the DISCOMs before they can be evaluated on the basis of the Result

Evaluation Matrix. Thereafter, performance on the basis of Result Evaluation Matrix shall form the basis for release of funds under the Scheme. Details are enclosed at **Annexure-III (Page : 12-16).**

4.5 The second part of the Action plan will list out the Work plan for loss reduction and further strengthening the Distribution System as per needs assessment. States/DISCOMs will be able to access funds from this Scheme for addressing infrastructure constraints in Distribution System and for its further augmentation/strengthening. Works which are required for AT&C loss reduction will be given priority. Indicative list of works to be covered under the Scheme is enclosed at **Annexure – IV (Page : 17)**. There is a provision of Rs. 20,000 crores in the Scheme for agriculture feeders where these have not been segregated as yet. Thereafter, these feeders will be solarized under KUSUM – leading to cheap/ nominally priced day time power for agriculture irrigation as may be determined by the State Government .

4.6 Prepaid Smart Meters including System metering with communication features are important interventions in reducing Distribution losses in the Utilities and in facilitating automatic measurement of energy flows and energy accounting as well as auditing without any human intervention. This intervention will also facilitate switch over to digital pre-paid system, with recharging facility through mobile phones, and enabling of Time-of-Day tariff.

4.7 In order to attain the key objective of loss reduction in electricity distribution, the Scheme envisages providing funding through Gross Budgetary Support for the installation of prepaid Smart Meters under TOTEX (CAPEX plus OPEX) pattern and in a mission mode in the first phase in (i) all Electricity Divisions of 500 AMRUT cities, with AT&C Losses > 15% (ii) all Union Territories (iii) MSMEs and all other Industrial and Commercial consumers (iv) all Government offices at Block level and above (v) other areas with high losses. Prepaid Smart metering for remaining consumers would be taken up by the respective DISCOMs in a phased manner subsequently. Looking at the scattered nature of agriculture connections and their remoteness from the habitations; as well as their proposed solarization under Kusum; the smart meters need not be installed in Agriculture connections.

4.8 Along with installation of prepaid Smart metering and the associated Advanced Metering Infrastructure (AMI), installation of communicable System meters at Feeder and Distribution Transformer level with communication features will also be through Gross Budgetary Support under TOTEX mode to enable proper energy accounting every month for identification of theft prone pockets and high loss areas.

4.9 Advanced ICT like Artificial Intelligence, Machine Learning and Blockchain Technology would be leveraged to analyse data generated through IT/OT devices including System Meters, prepaid Smart meters to prepare actionable MIS from system generated energy accounting reports every month so as to enable the DISCOMs to take informed decisions on loss reduction, demand forecasting, asset management, Time of Day (ToD) tariff, Renewable Energy (RE) Integration and for other predictive analysis. This would contribute a great deal towards enhancing operational efficiency and financial sustainability of the DISCOMs. Gross Budgetary Support (GBS) under the Scheme would be used for development of applications related to the use of advanced ICT like Artificial Intelligence, Machine Learning and Blockchain Technology in the Distribution Sector and also for promoting development of Start-Ups in the Electricity Distribution Sector across the country.

4.10 GBS under the Scheme would also be available to MoP/Nodal Agency to develop a Software for the Digital systems which can be utilized by the DISCOMs / Power Departments of the country, so that each DISCOM does not have to spend money separately on the Software. This Software will be developed in consultation with the DISCOMs, keeping in view data security and consumer privacy. However, this Software will be optional for the DISCOMs.

PART 'B'

4.11 Part-B contains supporting and enabling components such as up-gradation of Smart Grid Knowledge Centre including AI, Training / Capacity building, awards and incentives, reform support in form of consultancy, Nodal Agency fee, MoP enabling activities (communication plan, consumer awareness and other associated measures such as third party evaluation etc), and PMA charges etc. Details are enclosed at **Annexure – V (Page : 18).**

5. DISCOMs Eligible :

All State-owned Distribution companies and State /UT Power Departments (referred to as DISCOMs collectively) excluding private Sector power companies will be eligible for financial assistance under the Revamped Scheme.

6. Funding Pattern :

6.1 For rolling out prepaid Smart metering in a mission mode under Part A – in "Other than Special Category States", a fixed amount of 15% (22.5% in case of Special Category States) of the cost per meter worked out over the whole project period, subject to a maximum of Rs. 900/- (Rs. 1350/- in case of special category States) per meter in case of consumer meters, will be funded.

6.2 States/UTs would be incentivised for deployment of prepaid Smart meters by December, 2023. An incentive @ 7.5% of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter, whichever is lower, would be provided for "Other than Special Category States" for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023. The incentive for Special Category States would be @ 11.25% of the cost per consumer meter worked out for the whole project or Rs. 675 per consumer meter, whichever is lower. The funds for prepaid Smart Metering will be made available to the DISCOMs only after installation, commissioning and demonstration of at least one prepaid billing period in the area specified by the DISCOM in the DPR approved by the Monitoring Committee.

6.3 Development of applications related to the use of advanced ICT like Artificial Intelligence, machine Learning and Blockchain Technology in the Distribution Sector and the unified billing and collection system will be funded 100% through the GBS.

6.4 For Distribution System upgradation works, maximum financial assistance given to DISCOMs of "Other than Special Category States" will be 60% of the approved cost, while for the DISCOMs in "Special Category States", the maximum financial assistance will be 90% of the approved cost.

6.5 For the purpose of execution of this Scheme, all North Eastern States including Sikkim and States of Himachal Pradesh & Uttarakhand and Union Territories of

Jammu & Kashmir, Ladakh, Andaman & Nicobar Islands, and Lakshadweep will be treated as Special Category States/UTs

6.6 Part B of the Scheme will be fully funded by grant through Central/State Governments.

7. Release of Funds :

7.1 The funds for prepaid Smart Metering will be made available to the DISCOMs only after installation, commissioning and demonstration of at least one prepaid billing period in the area specified by the DISCOM in the DPR approved by the Monitoring Committee.

7.2 All DISCOMs that initiate their prepaid Smart metering tenders after 1st January, 2020 will be eligible for funding, if they carry out prepaid Smart metering works in TOTEX mode after obtaining approval of Monitoring Committee in this regard.

7.3 The funding for the works other than prepaid Smart metering, DT Metering and Feeder Metering including integration of existing Metering infrastructure would be contingent upon DISCOMs clearing the pre-qualifying criteria and achieving at least 60% marks on the result evaluation matrix.

7.4 The first instalment will be released as 10% advance on DPR approval and yearly fund release for second and subsequent instalments will be based on annual evaluation (as per agreed Results Evaluation Framework) as under:

- 2nd Instalment - 20% of GBS after 1st evaluation (30% cumulative)
- 3rd Instalment - 30% GBS after 2nd evaluation (60% cumulative)
- 4th Instalment - 40% GBS after 3rd evaluation (100% cumulative)

8. Financing of the Scheme :

8.1 The estimated outlay for the Scheme is Rs 3,03,758 crore with an estimated GBS from Central Government of Rs 97,631 crore. The Government of India will provide Rs. 1,030 Crore for activities under Part B of the Scheme. It is envisaged that about Rs. 200 crores will be spent by the State Governments towards reforms support in the form of consultancy.

8.2 Savings under various components of this Scheme (GBS) will be fungible across all parts of the Scheme with the approval of the Monitoring Committee .

8.3 Counterpart funding will be provided to DISCOMs by PFC/REC and/or Banks/other FIs. Further, counterpart funding from bilateral/multilateral funding agencies can also be leveraged for which Government of India would extend benefits of reduced Government Guarantee fee.

9. The performance of the DISCOMs in the Reforms Based Results Linked Revamped Distribution Scheme would also form integral part of the financing norms of PFC, REC, Banks/FI's for any project in the Distribution Sector even beyond those related to funding under this Scheme.

10. Monitoring Committee:

10.1 An inter-ministerial Monitoring Committee for the Scheme will be constituted under the chairmanship of Secretary, Ministry of Power. The Monitoring Committee will frame and approve all operational guidelines, sanction all Action Plans & DPRs of DISCOMs / States and proposals/DPRs under Part B, and review and monitor implementation of Scheme including review of Third-Party Mid-Term Evaluation of the Scheme carried out by the Nodal Agency.

10.2 The Monitoring Committee will also approve scope of works and take necessary decisions for operationalization of various components of the Scheme and amendments thereof, within the framework approved by Cabinet Committee on Economic Affairs (CCEA). The Monitoring Committee will also be competent to modify the scope of works under various parts of the Scheme in line with the objectives of the Scheme.

10.3 The maximum marks and targets for individual parameters in Result Evaluation framework may differ for each year of evaluation .The result evaluation framework would be different for each DISCOM and would be fixed for each year depending on the cumulative performance as well as the annual performance. The funds for a particular year in respect of Infrastructure Works would be released in respect of a DISCOM for a particular year only after it has been found to have fulfilled the pre-qualifying criteria and its total weighted score is at least 60 marks on the result evaluation matrix after having been evaluated by the Nodal Agency and approved as such by the Monitoring Committee . Evaluation of parameters relating to financial accounts shall be based on audited quarterly / annual accounts .

11. REC Limited and Power Finance Corporation Limited (PFC) would be the Nodal Agencies for the Scheme and would be responsible for operationalization of Scheme in the entire country.

12. The State Governments and their DISCOMs will sign a Tripartite Agreement with the Central Government before availing benefits under the Scheme.

13. The duration of the Scheme is 5 years (FY 2021-22 to FY 2025-26). The sunset date for the Scheme will be 31.03.2026.

14. The Nodal Agencies will submit monthly progress report indicating both financial and physical progress on the implementation of the Scheme to Ministry of Power and CEA.

15. The detailed guidelines for the implementation of the Scheme will be issued separately.

16. The expenditure under the Scheme would be debited to the budget grant no. 78 of Ministry of Power.

17. This issues with the concurrence of Finance Branch of the Ministry of Power vide their Dy. No. 379/Fin./2021 dated 20.07.2021.

20/7/21

(Tanmay Kumar)
Joint Secretary to the Government of India
Tele-Fax No.: 23714168
E-mail: tanmay.kumar-rj@gov.in

Annexure - I

Details of Part – 'A' and Part – 'B' of Scheme

Part- 'A' of Scheme – Funding for Smart Metering

Item Head	Item Description	Quantity	GBS, % (Max)
A-1	Prepaid Smart metering solution including at consumer, DT, and feeder level including integration of existing infrastructure	25 crore	15% / 22.5% (limited upto Rs.900 or Rs.1350 respectively per meter for Consumer metering)###
A-2	Other costs including encumbrance free standardized billing modules for all States, data management, data analytics, and support to implementation, AI etc.	Lumpsum	100%

Part- 'A' of Scheme – Funding for Infrastructure Creation

Item Head	Item Description	Quantity Estimated
A-3	Segregation of agriculture feeders	10,000 Nos.
A-4	Replacement of existing LT Overhead bare conductor lines with AB Cable / HVDS in theft prone areas	4,00,000 Kms
A-5	Distribution Automation in Urban Areas	
A-5.1	SCADA/DMS in Big cities, having population >2.75 lakh, including opex for 2 years	100 Nos.
A-5.2	SCADA (Real Time Supervision & Controllability of Sub-station) including opex for 2 years	3875 Nos.
A-6	Funding for distribution infrastructure including HVDS, IT and OT in Distribution Sector, Feeders, conductors, Transformers, cables, substations, feeders, capacitors etc. to cater to load growth and increasing demand	As required

Part- 'B' of Scheme

Item Head	Item Description	Quantity	Outlay (Rs. Crore)	GBS % (Max)	GBS(Rs. Crore)
B-1	Augmentation of Smart Grid Knowledge center including AI	-	30	100%	30
B-2	Training / Capacity building/ Awards and incentives	-	200	100%	200
B-3	Reforms support in form of consultancy		200	100%	-200*
B-4	Nodal agency fee, MoP enabling activities and PMA charges**	-	1,000	100%	1000
Sub-Total (Part-B):			**1,430**		**1,030**

**Amount for reform support in form of consultancy may be taken State Governments and utilized for the Scheme.*

***Approximately 1% of the estimated GBS for Part A for smart metering and Infra creation.*

For Part A – Prepaid Smart metering in "Other than Special Category States", a fixed amount of Rs 900 per consumer meter or 15% of the cost per consumer meter worked out for the whole project, whichever is lower, would be funded. In case of "Special Category States", a fixed amount of Rs 1350 per consumer meter or 22.5% of the cost per consumer meter worked out for the whole project, whichever is lower, would be funded. To incentivize the States/UTs for deployment of prepaid Smart meters by December, 2023. An incentive @ 7.5% of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter, whichever is lower, would be provided for "Other than Special Category States" for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023. The incentive for Special Category States would be @ 11.25% of the cost per consumer meter worked out for the whole project or Rs. 675 per consumer meter, whichever is lower. The incentive would be met out of overall provision of GBS for Smart Metering under the Scheme (Rs. 23,300 crore) along with expected cost reduction benefits arising out of economies of scale looking to the large-scale deployment of prepaid Smart meters in first phase, similar to the huge reduction in price experienced in large scale use of LED bulbs and solar power.

Indicative List of Reforms under PART-'A'

An indicative list of reforms / activities to be covered under the Scheme:

(i) Putting in place a mechanism to ensure that the Government Departments pay for the for electricity consumed, promptly

(ii) Putting in place a mechanism for ensuring that the consumption by the subsidized categories is accounted for properly and released to the DISCOM in advance as mandated by Section 65 of the Electricity Act 2003, which will be credited to the consumer account maintained by the DISCOM. Subsidy delivery must be targeted via Direct Benefit Transfer (DBT) for improvement in accountability

(iii) Annual Tariff Fixation, Tariff to reflect prudent costs; costs not reflected in Tariff shown separately, to be funded by the DISCOM/State Govt.; no Regulatory assets to be created, Multi Year Tariff (MYT).

(iv) Preparation of and adherence to a roadmap for funding accumulated and current financial losses, if any, through clearance of part or whole of regulatory assets and state funding.

(v) Energy Accounting with 100% feeder and transformer metering on OPEX model.

(vi) Corporate Governance reforms, Operation of part or whole area of supply of DISCOM through private participation or through CPSUs/JVs of CPSUs

(vii) Distribution Franchisee arrangements in some areas of DISCOM

(viii) Setting up electricity police stations in line with the provisions of the Electricity Act, 2003

(ix) Training and Capacity Building of existing manpower, Creation of IT cadre for management of IT/OT services or engaging knowledge partners / consultants for the same.

(x) Compliance of RPO trajectories

(xi) Publication of quarterly audited/unaudited reports in a standardized format circulated by PFC. Quarterly and Annual Accounts of DISCOMs need to explicitly include details of subsidy and Govt. Department dues. The annual accounts of the previous year would be published by DISCOMs latest by September 30th of the current year.

(xii) Initiation of performance linked transfer policy for DISCOM staff

(xiii) Any other activity which serves to achieve the objective of the Scheme.

Annexure – III

Results Evaluation Framework

The Results evaluation framework would have two components (i) Prequalifying criteria; and, (ii) Result evaluation matrix.

Pre-Qualification Conditions:

I. DISCOMs would publish quarterly un-audited accounts within 60 days of the end of each quarter during first two years of operation of the Scheme (i.e. for FY 2021-22 and FY 2022-23) and thereafter audited quarterly accounts within 45 days from 3rd year onwards.

II. Further, DISCOMs would publish audited annual accounts by end of December of the following year during first two years of operation of the Scheme (i.e. for FY 2021-22 and FY 2022-23) and thereafter audited annual accounts by end of September of the following year from 3rd year onwards.

III. DISCOMs will have ensured that no new Regulatory Assets have been created in latest tariff determination cycle.

IV. State Government to ensure 100% payment of subsidy for the previous year and advance payment of subsidy up to current period in line with section 65 of EA2003 and wipe out the remaining subsidy amount by the end of the project period.

V. All Government Department/ Attached Offices/ Local Bodies have made100% payment of current electricity dues for the year under evaluation.

VI. Progress commensurate to commitment in putting Govt. Offices on prepaid meters.

VII. No. of days Payables to Creditors / suppliers for the year under evaluation is equal to or less than the projected trajectory as per results evaluation framework.

VIII. Tariff order for the current year in which evaluation is being done and true up of penultimate year has been issued and implemented w.e.f. 1st April of current FY.

Utilities clearing the pre-qualifying criteria would be eligible for evaluation against the result evaluation matrix, which would determine their eligibility for release of funds for a particular year. The result evaluation framework would be different for each DISCOM and would be fixed for each year depending on the cumulative performance as well as the annual performance.

Four basic categories of Results Parameters have been identified and weightage has been assigned to each of the category as under:

Sr. No.	Category	Weightage for Evaluation
1.	Financial Sustainability	60
2.	Outcome of infrastructure Works	20
3.	Infrastructure Works	10
4.	Policy & Structural Reforms, Capacity Building and IT/OT Enablement	10
	Total	100

While the weightage of Financial sustainability would remain static at 60%, Monitoring Committee of the Scheme may make variations specific to the needs of the States/DISCOMs for other weightages

Under each of the categories above, there would be result parameters in the matrix, which will be assigned maximum marks on the basis of agreed priority/ significance towards achieving the objectives of the Scheme. The maximum marks and targets for individual parameters may differ for each of the evaluation years.

The funds for a particular year will be released only if the Utility clears the pre-qualifying criteria and the total weighted score is more than 60 marks on the evaluation matrix. Evaluation of parameters relating to financial accounts shall be based on audited quarterly/annual accounts.

Recognising that the year-wise emphasis on desired outcomes could be different, the Monitoring committee will reserve the right to allocate the maximum marks to individual result parameters for every year of evaluation. Result Evaluation Framework may be modified, if required, to include a smaller number of parameters and to exclude those included in the pre-qualifying criteria to avoid duplication and to make the Result Evaluation Framework simplistic.

RESULTS EVALUATION MATRIX (ILLUSTRATIVE)

Name of DISCOM: ____________________

SN	Result Parameters	Weightage	Unit of Measurement	Base Year [2020-21]	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
A.	**Financial Sustainability**	60						
1	ACS-ARR gap		Rs./kWh		25			
2	AT&C Loss - Increase in Billing and Collection Efficiency - Reduction in theft / line losses		%		25			
3	Outstanding/ Overdue Subsidy Payment by State Government		Rs. Crore		15			
4	Outstanding/ Overdue Government Dues		No. of Days Receivable		10			
5	Progress in putting Govt. Offices on prepaid meters		%		10			
6	No. of Creditor Days (including payment to Gencos for supply of power)		No. of days payable		5			
7	No. of Debtor Days		No. of days receivables		5			
8	Unliquidated Regulatory Assets		Rs. Crore		5			
	Sub Total (A)				Σ Max. Marks			Σ Score
	Weighted Score (A) = (Weightage x ΣScore)/ ΣMaximum Marks							
B	**Outcomes of Infrastructure works**	20						
1	Hours of supply (Rural)		Avg. Hours/ Day		20			
2	Hours of supply (Urban)		Avg. Hours/ Day		20			
3	Accurate Energy Accounts		%		20			
4	Reliability of power supply - SAIFI (System Average Interruption Frequency Index)		Nos. / year		20			
5	Reliability of power supply - SAIDI (System Average Interruption Duration Index		Hours or minutes/ year		20			

SN	Result Parameters	Weightage	Unit of Measurement	Base Year [2020-21]	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
	Sub Total (B)				Σ Max. Marks			Σ Score
	Weighted Score (B) = (Weightage x ΣScore)/ ΣMaximum Marks							
C.	**Infrastructure Works**	10						
1	**Metering**							
I	Consumer Metering		Nos.		10			
Ii	DT Metering		Nos.		20			
Iii	Feeder Metering		Nos.		20			
2	**Feeder Separation - % of total Agriculture feeders separated (Feeders with Agricultural load of >= 30% of total load of feeder)**		%		10			
3	Replacement of existing LT overhead bare conductor lines with AB/UG cable		Ckm		10			
4	% of Consumers with Prepaid Smart Meters (other than Govt. Deptt.)		%		15			
5	% of Govt Departments with Prepaid Smart Meters		%		15			
	Sub Total (C)				Σ Max. Marks			Σ Score
	Weighted Score (C) = (Weightage x ΣScore)/ ΣMaximum Marks							
D	**Policy & Structural Reforms, Capacity building and IT/OT enablement**	10						
1	SCADA		No. of Towns		15			
2	ERP Implementation		Yes/No		10			
3	Training of DISCOM Officials		Man-days		5			
4	Corporate Governance (Recommendations complied)		%		10			
5	Tariff Reforms (MYT / ToD / Cross Subsidy)				15			
6	Subsidy Delivery Mechanism/ DBT				15			

SN	Result Parameters	Weightage	Unit of Measurement	Base Year [2020-21]	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
7	Consumer rights and grievance redressal				15			
8	Adoption of PPP mode				15			
	Sub Total (D)				Σ Max. Marks			Σ Score
	Weighted Score (D) = (Weightage x ΣScore)/ Σ Maximum Marks							
	Sum of Weighted Score (A+B+C+D)							

Note : In order to qualify for receipt of grant under the Scheme , the total weighted score should be 60 or more .

Annexure – IV

Indicative List of Works under Part – 'A'

An indicative list of works to be covered under the Scheme:

(i) Replacement of conductors, which are old/frayed
(ii) Additional HT lines to improve quality of supply
(iii) Segregation of agricultural feeders
(iv) Provision of Aerial bunched Cables (ABC) in high loss areas
(v) High Voltage Distribution System (HVDS) in high loss areas
(vi) Supervisory Control and Data Acquisition (SCADA) in all urban areas; and DMS in 100 urban centres above the population of 2.75 lakhs as per urban census 2011
(vii) Prepaid/Smart metering systems
(viii) Works like new feeders, capacitors, etc for loss reduction
(ix) IT/OT enablement works
(x) Prepaid metering for all Government Departments
(xi) Distribution Works for system strengthening
(xii) Transformer / Feeder Metering – on OPEX Model

Segregation of feeders dedicated only for supply of power for agricultural purpose, which are proposed to be solarized under Kisan Urja Suraksha Evam Utthan Mahabhiyan (KUSUM) Scheme will be sanctioned on priority under the Scheme. Further, feeders once segregated will not be used for serving other than agricultural loads.

Annexure – V

Part B: Training & Capacity Building and Other Enabling & Supporting Activities

The major components covered under the Part B of the Scheme are:

I. Augmentation of Smart Grid Knowledge Centre including AI

Smart Grid Knowledge Center (SGKC) at PGCIL, Manesar is a facility developed under assistance from the Integrated Power Development Scheme (IPDS). The center has been established to act as resource center for smart grid activities in the country with various smart grid technologies on display on a lab scale. It also has state of the art Smart grid training facilities. SGKC will be upscaled as an incubation center for evaluating and disseminating new technologies, and also as an innovation park. An amount of Rs 30 Crores is earmarked for expansion of centers' activities with 100% gross budgetary support. These funds would also be used for creation of Center for development of applications related to use of Artificial Intelligence in Distribution Sector.

II. Training / Capacity building/ Awards and incentives

Training and capacity building of professionals in the Distribution Sector is a much-felt need. Training in good corporate governance practices, technical matters, advance technology intervention areas, new business processes, etc. both in India and abroad are envisaged under this head. The details of the training programs will be finalized by the Monitoring Committee.

Ministry of Power will institute various awards and incentives for DISCOM personnel and management for showing exemplary performance in areas both within and beyond the realm of the Scheme. These will be instituted with the approval of Monitoring Committee.

III. Reforms support in form of consultancy

The Scheme also envisages consultancy support for reform implementation. Ministry of Power, through the Nodal Agency, will appoint consultants both at national and state/regional levels based on the action plans finalized by the Monitoring Committee who will advise and assist MoP and States/DISCOMs in Scheme implementation, especially the reforms in DISCOMs

The consultancy support provided by the MoP to Union Territories for privatization of Power Departments/ Utilities under AatmaNirbhar Bharat Abhiyan will also be funded out of this component. The details of the consultancies shall be finalized by the Monitoring Committee. The costs towards this consultancy for the Scheme period will be borne by the Ministry of Power out of allocation under Part-B of the Scheme.

IV. Nodal agency fee, MoP enabling activities and PMA charges

This head will cover various enabling activities viz. communication plan, consumer awareness and other associated measures such as third-party evaluation, nodal agency fee and PMA charges etc.

Fwd: Submission of Action Plan & DPR under RDSS

11/30/22 10:55 AM

From: "cepl@bestundertaking.com" <cepl@bestundertaking.com>

To: "cerc@bestundertaking.com" <cerc@bestundertaking.com>, "dcemerc@bestundertaking.com" <dcemerc@bestundertaking.com>

PFA

From: "cepl@bestundertaking.com" <cepl@bestundertaking.com>
Sent: 8/22/22 6:59 PM
To: "sk_shah@pfcindia.com" <sk_shah@pfcindia.com>, "ak.rathore@pfcindia.com" <ak.rathore@pfcindia.com>, "tk_gupta@pfcindia.com" <tk_gupta@pfcindia.com>
Cc: "agmes@bestundertaking.com" <agmes@bestundertaking.com>, "ssgmbest@bestundertaking.com" <ssgmbest@bestundertaking.com>
Subject: Submission of Action Plan & DPR under RDSS

Dear Sir,

Please find enclosed herewith letter of submission of Action Plan & DPR under RDSS for the BEST Discom, Maharashtra.

For your information and further necessary action, please.

Regards

S.P.Makwana
Chief Engineer (Planning),BEST
Nodal Officer, RDSS

Attachments:

- Letter to PFC regarding submission of Action Plan & DPR.pdf

Lokesh Chandra I.A.S.
General Manager

BRIHAN - MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
BEST Bhavan, BEST Marg, Colaba,
Mumbai - 400 001.
Tel. : 022-22873961, 022-22873962
Fax : 022-2285 1244
E-mail :gm@bestundertaking.com

Ref.No. GM/AGMES/18668 /2022 Date: 22nd August 2022

Executive Director (IPDS)
Power Finance Corporation Limited
Urja Nidhi, 1, Barakhamba Lane,
Connaught Place,
New Delhi –110001

Sub:- Submission of Action Plan & DPRs under RDSS covering Loss Reductions works for Rs. 2321 Cr, Modernization & System Augmentation works for Rs. 430.63 Cr, Metering works for Rs. 708.54 Cr and Capacity building & training for Rs. 0.81 Cr, totalling Rs. 3460.98 Cr for the BEST Discom, Maharashtra state.

Sir,

Please find attached herewith signed copy of Action Plan & DPRs for Loss Reductions works for Rs. 2321 Cr, Modernization & System Augmentation works for Rs. 430.63 Cr and Metering works for Rs. 708.54 Cr and Capacity building & training for Rs. 0.81 Cr, totalling Rs. 3460.98 Cr for the BEST Discom, Maharashtra state under Revamped Distribution Sector Scheme (RDSS). The same will be updated on RDSS portal.

In this regards, it is confirmed that:-

1. Action Plan & DPRs have been prepared in accordance with RDSS Guidelines/ MoP Directives.
2. There is no overlapping of proposed works with any other Scheme.
3. Action Plan & DPRs have been prepared in accordance with approved Action Plan/ Result evaluation frameworks by State Cabinet on 27.07.2022 (Copy attached Annexure-1)
4. DPRs have been duly recommended by DRC. (Recommendations of DRC enclosed as Annexure-2).
5. Rates under Loss Reduction and Modernization & System Augmentation DPRs have been taken from latest available Schedule of Rates (SoR) and

the rates derived in turnkey project under IPDS scheme executed by BEST. For the items which are not covered in SoR/ Turnkey Project under IPDS the approved market rates have been taken. Rates for Smart Metering works have been taken as Benchmark Lifecycle cost as provided in Standard DPRs of Smart Metering works. Rates for SCADA DPRs are as per Benchmark Cost provided in Model SCADA DPR Template.

6. Any non-eligible items in accordance with clause 4.1 of RDSS guidelines have been excluded.
7. Smart metering works have been proposed in Totex mode and all consumers Meters are in Pre-paid mode while System Meters are communicable AMI/AMR meters.
8. For Smart Metering works 1080667 nos. meters in Totex mode and pre-paid mode are proposed to be installed under RDSS scheme in accordance with RDSS guidelines.
9. Capex proposed for loss reduction are commensurate with loss level, root causes and corresponding corrective measures.
10. Capex proposed under Modernization & System Augmentation DPRs are in accordance with Action Plan and are for strengthening & augmentation of distribution network and enhancement of power supply reliability.
11. The works for Loss Reduction/ Modernisation are proposed to be executed by Turnkey mode while for Smart Metering as Totex Mode.
12. Authorized signatory details for RDSS is attached. (Annexure 3).

It is requested to kindly put up these Action Plan & DPRs to Monitoring committee of RDSS for approval.

Yours faithfully,

(Lokesh Chandra)
General Manager

22/8/22

02:10: RDSS: 2021: I: BEST 21.11.2022

The Principal Secretary
Department of Energy, Govt. of Maharashtra,
3rd Floor, Main imarat, Madamkama Road,
Huttama Rajguru Chowk Mantralaya,
Mumbai Maharashtra - 400032

Sub: Financial assistance to BEST for implementation of Projects under Revamped Distribution Sector Scheme (RDSS) of Govt. of India in the State of Maharashtra.
Grant No. 21981001 (RDSS Metering Works)
Grant No. 21982001 (RDSS Loss Reduction Works)
Grant No. 21984S01 (RDSS PMA for Smart Metering Works) and
Grant No. 21984L01 (RDSS PMA for Loss Reduction Works)

Sir,

1. With reference to BEST letter dated 22.08.2022 regarding financial assistance under Revamped Distribution Sector Scheme (RDSS), we are pleased to convey that Monitoring Committee for RDSS constituted under the Chairmanship of Secretary (Power), Govt. of India, in its 13th meeting held on 28.10.2022 has approved the Action plan and Detailed Project Report (DPRs) for Loss Reduction works and Prepaid Smart Metering works of Brihanmumbai Electricity Supply and Transport Undertaking (BEST) under RDSS scheme as per below mentioned details:

   a) Results Evaluation Matrix for BEST as enclosed at **Annexure A** along with pre-qualifying criteria.
   b) DPR for Prepaid Smart metering works with total Project Cost of Rs. 659.17 Cr with Government Budgetary Support (GBS) of Rs. 146.69 Cr including incentive for Phase-I as per details in **Annexure B**.
   c) DPR for Infrastructure– Loss reduction works with total Project Cost of Rs. 972.88 Cr with GBS of Rs. 583.73 Cr as per details in **Annexure C**.
   d) Project Management Agency (PMA) charges of Rs. 17.07 Cr for Prepaid Smart Metering works and Infrastructure- Loss reduction works with GBS of Rs. 10.24 Cr as per details in **Annexure D**.

   Summary of approved projects cost and GBS for Projects and PMA is attached at **Appendix-I**.

2. **Funding Pattern:**

   a. The funding Pattern for BEST in the State of Maharashtra is given below:

Item Description	GBS % (Max)
Prepaid Smart metering solution at consumer, DT, and feeder level including integration of existing infrastructure	15% of the approved cost of metering including the operational cost, provided that it is not more

	than Rs. 900 per meter for consumer metering only.
Distribution Infrastructure works	60% of the approved cost of Distribution infrastructure works
PMA Charges for Metering and Infrastructure works	60% of the approved cost of PMA

b. The project cost approved by the Monitoring Committee or actual cost incurred whichever is less, shall be the eligible cost for determining the grant under the scheme for Infrastructure works and PMA Components. Any cost overrun after approval of the project by Monitoring Committee due to any reason whatsoever shall not be eligible for any grant and shall be borne by the BEST/respective State Government.

c. The release of GBS by Government of India will be subject to prescribed scheme guidelines and would be contingent to award of prepaid smart metering works & its satisfactory progress.

3. The terms and conditions of the sanction are as given below:

a) BEST to ensure implementation of the scheme in accordance with all the prescribed scheme guidelines (including SBDs).

b) **Prepaid Smart Metering works:**

i. DISCOM to submit the timelines for completing ongoing Smart Metering works. Further nodal Agency to ensure that timelines for completing Smart Metering (both Consumer and System metering) are adhered to and all consumers in the State/ DISCOM area are covered under Smart Metering within these timelines as per scheme guidelines.

ii. Funding under Metering component will be available only to Prepaid smart meters operating in prepayment mode for consumers, and in accordance with the uniform approach indicated by the Central Government, with implementation in OPEX/TOTEX mode.

iii. The Grant for smart metering works would be released in three equal yearly instalments subject to fulfilment of performance criteria including prescribed SLAs. Further, the grant per meter would also be rationalized considering exclusion of MDM from the scope of AMISP.

iv. A feeder and DT level automated online energy accounting system shall be put in place.

v. All feeders are to be metered with communicable & AMI/AMR meters by 31st December 2022, and shall be integrated with the National Feeder Monitoring System (NFMS) proposed to be put in place shortly.

vi. BEST to complete 100% DT Metering in Phase - I areas by March 2023 and in remaining areas by December 2023 to facilitate energy accounting.

vii. BEST while implementing the prepaid smart metering projects, shall ensure that the remotely readable metering at DT level; Consumer indexing; integration of feeder level data; and the consumer billing database under the AMI contracts are prioritised to be completed latest by March 2023.

viii. Prepaid Smart Meters may be installed outside the consumer premises, may be pole mounted, ground mounted panels, incoming service cables that may be armoured etc.

c) **<u>Infrastructure works & PMA Charges:</u>**

i. All feeders segregated for Agriculture should be solarized under the PM- KUSUM scheme of MNRE or any other similar scheme of State Government.
ii. BEST to carry out feeder level analysis to identify high loss feeders for reduction of losses through appropriate measures proposed in the DPR. The details of such feeders to be included in the DPR and submitted to Nodal Agency to verify the same. Feeder level analysis should be completed as early as possible but within 90 days of sanction.
iii. PMA charges over and above the permitted amount shall be borne by the BEST/ State Government.
iv. Also, services of PMA shall be retained up to completion of the project, without any financial implications beyond that already provided.
v. The Monitoring committee has advised nodal agency to review the tender documents already floated by the BEST in accordance with the respective SBD's. The fund release under RDSS shall be subject to compliance of RDSS guidelines and provisions of SBD's. Some minor deviations may be allowed subject to approval of Nodal Agency and Monitoring Committee.

The detailed terms & conditions of sanction letter is enclosed as **Annexure E**.

4. **<u>Result Evaluation Matrix and pre-qualifying criteria:</u>**

a) The AT&C losses and ACS-ARR Gap trajectories approved by Monitoring Committee are as given below:

Parameter	Units	Max marks	Base Year	Baseline values	Targets			
					FY 2022	FY 2023	FY 2024	FY 2025
ACS-ARR Gap								
(i) On Cash Basis	Rs./ kWh	30	2021	0.94	0.30	0.20	0.10	0
(ii) On subsidy received basis,				0.705	0.15	0.15	0.09	0
AT&C loss	%	30	2021	8.18%	8.00%	7.80%	7.60%	7.50%

b) BEST to mandatorily meet the pre-qualifying criteria and achieve the specified marks in the Evaluation Matrix based on which DPR for Modernisation & System Augmentation shall be sanctioned and grant for both loss reduction works (other than the advance for DPR for Loss Reduction) and for the Modernisation & System Augmentation works will be released.
c) BEST to ensure timely adoption of all suitable measures to meet the prequalifying criteria and to score at least 60% marks on the agreed Result Evaluation Matrix.
d) If by the end of year 2025-26, the BEST is not eligible for release of any grant, the initial advance of 10% of the grant component of the cost of DPR for Loss Reduction will have to be refunded by the DISCOM.

e) Approval of the Competent Authority shall be taken for changes in Action Plan made after approval of the Cabinet in accordance with direction of RDSS Monitoring Committee/ MOP/ Nodal Agency.

5. Fund Management:

a. BEST shall ensure that funds released under the scheme are utilized for the purpose for which it is released and will not be diverted for any other purposes whatsoever. The grant release from Nodal Agencies to the BEST shall be done through PFMS and the BEST shall use PFMS for fund flows to the lowest level as specified by the Government of India's instructions on the subject under the scheme.

b. BEST shall submit utilization certificates (UC) for the funds released during the financial year in prescribed format latest by 30th April of succeeding year in addition to the UC along with every claim.

c. For release of funds under the Scheme, BEST has to ensure updation of baseline data, physical & financial progress, Quality Monitoring, Fund Management, Asset identification through Geo-tagging, outcomes and achievements for evaluation under Result Evaluation Framework, closure, etc. on the digital platform to be developed by the Nodal Agencies.

d. For works other than metering works under Part A, counterpart funding will be provided by the BEST/ State Government. If BEST takes loan for counterpart funding, such loan will be taken from REC and PFC only. Further, counterpart funding from bilateral/multilateral funding agencies can also be leveraged for which the Government of India would extend benefits of reduced Government Guarantee fee.

e. In case loan component of the project cost is funded by the NBFCs under MoP, then in order to secure the loan, the existing TPA (Tri-partite Agreement) arrangement among Government of India, the State Government and the RBI shall be suitably amended to provide that the loan servicing payments in case of default can be recovered through RBI.

6. A Scheme Implementation Agreement will be signed between the Government of Maharashtra, BEST and Nodal Agency on behalf of MoP within 30 days of issuance of sanction letter. Copy of approved agreement format is attached at **Appendix-II**.

7. The Monitoring Committee is empowered to recall the grant released to the BEST at any stage of the scheme, in case the sanctioned works are left incomplete, or the assets could not be put to use, or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines.

8. BEST to undertakes to seek full authorization by way of its Resolution passed in subsequent meeting of its Board / State Govt. in order to implement the RDSS Scheme on the said terms and conditions to the satisfaction of the Government of India / Nodal Agency.

9. Any unrecovered/ outstanding dues amounts of earlier Schemes of Ministry of Power, GOI shall also be allowed to be adjusted against releases in the current scheme.

10. It is requested to kindly acknowledge and accept the sanction letter within 15 days from the date of issue of this sanction letter as per the acceptance letter enclosed as **Annexure- F**.

11. The appointment of PMA and/or PIA, if any, should be in line with the RDSS Guideline and MoP letter dated 18th May 2022 & subsequent amendment thereof.

12. District wise and Project area wise bifurcation of work and project cost approved for Infrastructure – Loss reduction works etc. is to be submitted by BEST within 15 days of the issuance of the 13th MCM minutes as per the requirement of MOP/ Nodal Agency.

13. The sanction is subject to undertaking / commitment and implementation by BEST of the SOP issued by Ministry of Power as mentioned in para (o) of the decisions mentioned in minutes of 13th meeting of Monitoring Committee for RDSS.

Yours sincerely,

Encl: As Above

Saurav Kumar Shah
Executive Director
for **Power Finance Corporation**

Copy to:

1. Chairman & Managing Director, Brihanmumbai Electricity Supply and Transport Undertaking, BEST Bhawan, BEST Marg , Colaba, Mumbai, Maharashtra - 400001.
2. Joint Secretary (Distribution), MoP, Shram Shakti Bhawan, Rafi Marg, New Delhi-110001

Result Evaluation Framework for BEST (Maharashtra) **Annexure A**

S No.	Result Parameter	Units	Maximum Marks	Base Year and Baseline values (FY2021)	Targets			
					FY2022	FY2023	FY2024	FY2025
A	**Financial Stability (60% weightage; 65% in 1st year)**							
1	ACS-ARR Gap – Cash basis	Rs./ kWh	30	0.94	0.30	0.20	0.10	0.00
	ACS-ARR Gap – Subsidy received basis			0.705	0.15	0.15	0.09	0.00
2	AT&C loss	%	30	8.18	8.00	7.80	7.60	7.50
3	Outstanding/ Overdue Government Dues	Rs. Crore	15	41.43	30	20	10	0
4	Progress in putting Govt. Offices on prepaid meters (Total: 7634 Nos.)	%	15	0%	0%	5%	100%	100%
5	No. of creditor days (including payment to Gencos for supply of power)	Days Payable	5	9.5	Less than 45 days			
6	No. of debtor days	Days Receivable	5	53.5	Less than 45 days			
			100					
B	**Outcomes of Infra works (20% weightage)**							
1	Hours of supply (Urban)	Avg. Hours/ Day	20	23:53	23:54	23:55	23:56	23:57
2	%age of Feeder Level Energy accounting being published - BEE	%	20	0	0%	100%	100%	100%
3	%age of DT Level Energy accounting being published	%	20	0	0%	100%	100%	100%
4	Reliability of power supply - SAIFI (System Average Interruption Frequency Index)	Nos/ Year	20	2.63	2.50	2.25	2.0	1.50
5	Data availability in the National Feeder Monitoring System / NPP	%	20	0	0%	100%	100%	100%
			100					
C	**Infrastructure Works (10% weightage)**							
	Metering							
1	Consumer Metering [Target : 10,44,000]	%	20	0%	0%	25%	99%	100%

2	DT Metering [Target : 3356]	%	20	0	0%	100%	100%	100%
3	Feeder Metering [Target : 1239]	%	20	0	0%	100%	100%	100%
4	% of Consumers with Prepaid Smart Meters (other than Govt. Dept.)	%	15	-	-	15%	55%	100%
5	Augmentation of substations (add/ replace of DT's) – (Target : 666 Nos)	Nos	15	-	-	35	400	666
6	Replacement of weak/Old UG cables (33, 11KV & 22KV) to improve the quality of supply (Target : 373 Km)	Kms	10	-	-	35	180	373
			100					
D	**Policy and Structural Reforms (10% weightage)**							
1	SCADA	No. of Towns/ %	25	-	0	0%	100%	100%
3	ERP Implementation & Billing Module (Target: 6 Modules)	Yes/ No	25	0	0	0	3	6
4	Training of Discom Officials	Mandays	20	0	0	800	800	800
5	DT Failure rate	%	15	0.54	0.54	0.50	0.45	0.45
6	Digital Payments : as a % of total revenue collected	%	15	64%	65%	67%	70%	75%
			100					

Smart Metering DPR (BEST- Maharashtra) **Annexure – B**

Sl No.	Major Component	Item Particulars	Expected Life cycle unit cost (Rs. per meter)	Quantity (Phase I)	Quantity (Phase II)	Total Quantity	Estimated cost in Rs. Crores
				No.	No	Nos.	
(1)	(2)	(3)	(4)	(5)	(6)	(7) = (5)+(6)	(8) = (4)x(7)
1	**Consumer Metering**						
1.1		1 Phase Whole Current Smart Consumer Meter	6,000	8,90,071	11,131	9,01,202	**540.72**
1.2		3 Phase Whole Current Smart Consumer Meter	6,000	1,66,339	2,080	1,68,419	**101.05**
1.3		3 Phase LT-CT Operated Smart Consumer Meter	6,000	5,978	75	6,053	**3.63**
1.4		3 Phase CT-PT Operated HT Smart Consumer Meter	6,000	204	3	207	**0.12**
	Sub-Total			**10,62,592**	**13,289**	**10,75,881**	**645.53**
2	**DT Metering***	3 Ph LT-CT Operated DT Meter	23,000	3,356	42	3,398	**7.82**
3	**Feeder Metering**	3 Ph CT-PT Operated feeder Meter	42,000	1,239	16	1,255	**5.27**
4	**Boundary Metering**	3- phase CT/PT operated Boundary meter	42,000	131	2	133	**0.56**
	Total			**10,67,318**	**13,349**	**10,80,667**	**659.17**
	Total GBS excluding incentive for Phase – I						**98.88**
	Incentive for Phase – I						**47.82**
	Total GBS including Incentive of Phase - I						**146.69**

***100% DT metering to be completed by December 2023**

Infrastructure works under Loss Reduction (BEST-Maharashtra) **Annexture C**

S.No.		Description	Unit	Unit Cost (in Rs Lakhs)	Qty.	Total Cost (in Rs. Crore)
A	**ERP, Billing Software and IT/OT enablement works**					
	1	New MBC solution (SaaS mode)	LS	2259.00	1	22.59
	2	ERP Solutions incl. License cost & Implementation cost etc. (MM, FICO, HCM, AM, DMS, BI/BW)	LS	3219.00	1	32.19
	3	Infrastructure Hardware (IaaS) Cost for ERP deployment	LS	870.00	1	8.70
	4	Network connectivity across all sites, head office and central cloud infrastructure	LS	667.00	1	6.67
	5	Complete setup of centralized Customer Call Centre	LS	221.00	1	2.21
	6	Contingency Charges@5% of Project Cost	LS	362.00	1	3.62
		Sub Total (A)				**75.98**
B	**Implementation of SCADA & DMS**					
	1	**Implementation of SCADA & DMS**	LS	14372.00	1	143.72
		Sub Total (B)				**143.72**
C	**Replacement of old Switchgear**					
	1	Replacement of 33 KV, 1500MVA Switchgears with relays	Nos.	17.32	19	3.29
	2	Replacement of 11 kV, 350MVA Switchgears with relays at RSS (10 switchgear per panel)	Panels	63.06	32	20.18
	3	Replacement of 11 kV OCB Switchgears by VCB Switchgears at DSS (No. given of DSS)	Nos.	21.40	396	84.74
	4	Replacement of Oil Ring Main Unit by SF6 Ring Main Unit	Nos.	8.23	95	7.82
		Sub Total (C)				**116.03**

D	**Renovation /Augmentation of Infrastructure at Power/Receiving Substations**					
	1	Additional / Replacement of Transformer (Power Transformer) - 16/ 20 MVA ONAN/ONAF	Nos.	251.16	20.00	50.23
		Sub Total (D)				**50.23**
E	**Renovation /Augmentation of Infrastructure at Distribution Substations**					
	1	Augmentation of substations (additional / replacement of Distribution transformer (995 KVA) along with Breakers/Cable)	Nos.	28.95	666	192.80
	2	No of New RMUs	Nos.	8.23	104	8.56
		Sub Total (E)				**201.36**
F	**Renovation /Augmentation of HV and LV lines**					
	1	Replacement / Additional of 33KV, with 3cx 300 sq.mm Cu. XLPE Cables	Kms	132.68	120	159.22
	2	Replacement / Additional of HV weak/Old cable with 3C X 240 SQ. MM XLPE AL. cables	Kms	63.24	203	128.38
	3	Replacement / Additional of LV weak/Old cable with LV 4C X 300 SQ. MM XLPE AL. cables	Kms	50.86	50	25.43
		Sub Total (F)				**313.03**
G	**Auxiliary component cost for Consumer metering**					
	1	Auxiliary component cost for Consumer metering (Single pole MCB, Copper service cable etc)	NOS	0.01	523357	**72.53**
		Sub Total (G)				
	Total Cost of Loss Reduction in Crs. (A+B+C+D+E+F+G)					**972.88**
	Total GBS @ 60%					**583.73**

Details of PMA Charges (BEST Maharashtra) **Annexure – D**

Sl. No.	Particulars	Total Project Cost	GBS*	PMA Charges**	GBS for PMA Charges***
1	**Smart Metering Works**	659.17	98.88	2.47	1.48
2	**Infrastructure Works – Loss Reduction**	972.88	583.73	14.59	8.76
	Total	**1632.05**	**682.60**	**17.07**	**10.24**

* Excluding incentives in case of Smart Metering works of Phase-I.
** 2.5% of GBS for Smart Metering (excluding incentive) and 1.5% of total project cost for Infrastructure works.
*** 60% of PMA Charges.

Appendix-I

Approved DPR Cost and Government of India (GoI) Grant for BEST, Maharashtra

All amount in Rs. Cr.

Sl. No.	Grant No.	Name of the Project	Approved Project Cost	GoI Grant* Sanctioned	Additional Incentive** for Phase-I Smart Metering (GoI Grant)
1	21981001	RDSS Smart Metering Works	659.17	98.88	47.82
2	21984S01	RDSS PMA Grant for Smart Metering works	2.47	1.48	NA
Total			**661.64**	**100.36**	
3	21982001	RDSS Loss Reduction Works	972.88	583.73	NA
4	21984L01	RDSS PMA Grant for Loss Reduction Works	14.59	8.76	NA
Total			**987.47**	**592.49**	
Grand Total			**1649.11**	**692.85**	**47.82**

** 15% of the approved cost of the metering including the operational cost, provided that it is not more than Rs. 900 per meter for consumer metering only.*

*** Maximum incentive GBS for deployment of prepaid Smart meters by December, 2023- 7.50% of the cost per consumer meter including operational cost or Rs. 450 per consumer meter, whichever is lower*

General Terms and Conditions Applicable for Availing Financial Assistance under Revamped Distribution Sector Scheme

The terms and conditions of financial assistance as set out here under shall be binding on the DISCOM and State Government in accordance with the Scheme Implementation Agreement to be executed amongst PFC (on behalf of MoP), State Government & State Discom.

A. Project Financing & Fund Management:

1. The funding pattern under the scheme is as given below:

Part	Item Description	GBS % (Max)
Part A	Component I: Prepaid Smart consumer metering solution including Communicable/Smart System Metering at DT, feeder and boundary level including integration of existing infrastructure.	15% / 22.5% of meter lifecycle cost as the case may be (limited up to Rs.900 or Rs.1350 respectively per meter for Consumer metering only)
	Component II: Distribution Infrastructure works including SCADA, DMS, AB cables, feeder segregation etc.	60% or 90% of project cost as the case may be

2. The project cost approved by the Monitoring Committee or actual cost incurred whichever is less, shall be the eligible cost for determining the grant under the scheme for Component II and III of Part A. Any cost overrun after approval of the project (by Monitoring Committee) due to any reason whatsoever shall not be eligible for any grant and shall be borne by the DISCOM/respective State Government.

3. Part A: Component I- Metering:

3.1. The operation and maintenance cost of the meter over the life of the meter as per the SBD shall be included in the project cost.

3.2. Prepaid Smart metering for consumers, and System metering at Feeder and Distribution Transformer level with communicating feature along with associated Advanced Metering Infrastructure (AMI) will be done in TOTEX mode through PPP, to facilitate reduction of Distribution losses and enable automatic measurement of energy flows and energy accounting as well as auditing in line with the BEE regulations which will help in identifying high loss packets.

3.3. Funding under Metering component of Part A will be available only if the DISCOM agrees to the operation of smart meters in prepayment mode for consumers, and in accordance with the uniform approach indicated by the Central Government, with implementation in TOTEX mode. Pre-paid smart metering works carried out after 1st January, 2020 will be eligible for funding, if they were carried out in TOTEX mode, after obtaining approval from Monitoring Committee in this regard

3.4. In areas which do not have communication network, installation of prepayment meters, may be taken up.

3.5. The financial support for Metering Component under Part A of the scheme shall be as under:

3.5.1. *Other than Special Category States:* 15% of the project cost of the metering works including the operational cost, limited upto Rs. 900 per meter for consumer metering only would be provided as grant by Government of India. Further, an incentive @ 7.5% of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter, whichever is lower, would be for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023.

3.5.2. *Special Category States (All North Eastern States including Sikkim, Himachal Pradesh & Uttarakhand and union Territories of Jammu & Kashmir, Ladakh, Andaman & Nicobar Islands & Lakshadweep)*: 22.5% of the project cost of the metering works including the operational cost, limited upto Rs. 1350 per meter for consumer metering only would be provided as grant by Government of India. Further, an incentive @ 11.25% of the cost per consumer meter worked out for the whole project or Rs. 675 per consumer meter, whichever is lower, would be for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023.

4. Part A: Component II- Distribution Infrastructure works:

4.1. The eligible project cost shall include Central taxes and all fees like forest clearance, highway and railway crossing fee etc. The project cost shall however not include the cost of land, cost of buildings other than sub stations and anti-theft police stations, service lines to new consumers, compensation towards ROW (except forest clearance, highway and railway crossing fee), office equipment & fixtures, spares (other than mandatory spares prescribed by manufacturer), T&P, road cutting charges, vehicles and salaries and establishment expenditure. Further, the project cost shall be reduced to the extent of any Liquidated Damages actually levied, but the encashment of performance security or bid security (EMD) shall not reduce the project cost.

4.2. Feeders having significant agricultural load (30% or more) may be considered for separation under the loss reduction part of DPR and the same should also be proposed for solarization under the PM- KUSUM scheme of MNRE or any other scheme of Government.

4.3. Discom to submit feeder wise analysis of high loss feeders being taken up on priority under loss reduction works, within the 3 months of sanction to Nodal Agency.

4.4. The financial support for Part A: Component II under the scheme shall be as under:

4.4.1. Other than Special Category States:

a) 60% of project cost of works other than metering works under Part A and approved cost of PMA would be provided as grant by Government of India.

b) 40% of project cost of works and approved cost of PMA shall be arranged through own sources of State Government/ Utility or may avail loan from PFC & REC. Funding from bilateral/multilateral funding agencies can also be leveraged for which the Government of India would extend benefits of reduced Government Guarantee fee.

4.4.2. Special Category States (All North Eastern States including Sikkim, Himachal Pradesh & Uttarakhand and union Territories of Jammu & Kashmir, Ladakh, Andaman & Nicobar Islands & Lakshadweep) *a)* 90% of project cost of works and approved cost of PMA would be provided as grant by Government of India.

b) 10% of project cost of works and PMA works shall be arranged through own sources of State Government/ Utility or may avail loan from PFC & REC. Funding from bilateral/multilateral funding agencies can also be leveraged for which the Government of India would extend benefits of reduced Government Guarantee fee.

5. Part A: Component III- Project Management:

5.1. 2.5% of the GBS of metering component and 1.5% of project cost of Distribution infrastructure works component, shall be allowed as PMA charges under the Scheme. PMA charges, over and above the permitted amount shall be borne by the respective DISCOM / State government.

5.2. 60% of the PMA charges allowed under the scheme for metering and Distribution infrastructure work components would be provided as grant by Government of India for other than Special Category States. For Special Category States, Government of India grant would be 90% of the allowed PMA charges.

5.3. Services of PMA shall be retained up to physical completion of the project, without any financial implications beyond that already provided

6. Release of grant to Discom by PFC:

6.1. Release of grant for Metering:

a) Grant for metering works, will be due when a meter is successfully installed and commissioned, and essential services and data related to it are provided for a period of one month to the DISCOM. It will be essential that a consumer meter is recharged at least once, for the release of grant pertaining to it to become due.

b) The DISCOM may submit claim for release of grant in a phased manner when grant becomes due against 5% of the total meters planned to be installed, or such number of meters or such period that the Nodal Agencies deem practical and convenient. After the first release, subsequent releases shall be subject to submission of utilization certificate of the previous releases.

6.2. Release of grant for Distribution Infrastructure works:

6.2.1. **Phase I- 10% of the grant for Loss reduction part of Project** (5% on sanction and further 5% on award of works)

a) Approval of the project by the Monitoring Committee
b) Execution of Scheme Implementation agreement

6.2.2. **Phase II**
30% of the grant for Loss reduction part of project in FY 2022-23 (including the advance 10%):

a) Qualification as per the Results Evaluation Framework of the Action Plan for FY 2021-22.
b) Submission of a certificate regarding utilization of grant already released in the Format prescribed by Ministry of Finance;

c) Submission of a certificate regarding receipts and expenditure on the project certified by a Chartered Accountant ;
d) Submission of physical and financial (grant and counterpart funding) progress report;
e) Sanction letter for counter-part funding / DISCOM's own resources / State Government funding for Distribution Infrastructure Works.
f) Award of prepaid Smart Metering works to be covered in the first phase to be completed by December 2023, as per the clause 3.2.2.2 of scheme guidelines.

30% of the grant for Modernization & System Augmentation part of project in FY 2022-23 (10 % on sanction and 20% on award of works.)

a) Approval of the project by the Monitoring Committee
b) Execution of Scheme Implementation agreement
c) Award of prepaid Smart Metering works to be covered in the first phase to be completed by December 2023, as per the clause 3.2.2.2 of scheme guidelines.

6.2.3. **Phase III: Cumulative release of 60% of grant component of the project cost of DPRs in FY 2023-24:**

a) Qualification as per the Results Evaluation Framework of the Action Plan for FY 2022-23.
b) Submission of a certificate regarding utilization of grant already released in the Format prescribed by Ministry of Finance;
c) Submission of a certificate regarding receipts and expenditure on the project certified by a Chartered Accountant;
d) Submission of physical and financial (grant and counterpart funding) progress report;
e) Sanction letter for counter-part funding / DISCOM's own resources / State Government funding for Distribution Infrastructure Works.

6.2.4. **Phase IV: Cumulative release of 95% of grant component of the project cost of DPRs in FY 2024-25:**

a) Qualification as per the Results Evaluation Framework of the Action Plan for FY 2023-24.
b) Submission of a certificate regarding utilization of grant already released;
c) Submission of a certificate regarding receipts and expenditure on the project certified by a Chartered Accountant;
d) Submission of physical and financial (grant and counterpart funding) progress report;
e) Sanction letter for counter-part funding / DISCOM's own resources / State Government funding for Distribution Infrastructure Works.

6.2.5. **Cumulative release of 100% of grant component of the project cost of DPRs in FY 2024-25:**

a) Submission of project completion report as per clause 4.9.1 of scheme guidelines.

6.2.6. Release of grant for PMA

Grant for PMA component shall be released, subject to the following conditions:
(i) Grant shall be released on the basis of the sanctioned cost or award cost, whichever is lower;

(ii) Grant will be released in the month of March, every year;
(iii) 10% shall be released as advance in the year of sanction;
(iv) 30% shall be released each year subsequent to the sanction year;
(v) Subsequent releases shall be subject to submission of utilization certificate of the previous releases and achievement against deliverables as specified in the SBD referred to in Clause

Discoms shall comply the amendments/supplemental to conditionalities prescribed for release of particular installment, if any, issued by MoP/PFC in future.

7. If DISCOM achieves the targets as per Action Plan of any previous FY in a subsequent year, then it shall be eligible for release of grant pertaining to that FY.

8. DISCOM (Implementing Agency) shall open an Assignment Account with NDRO, Reserve Bank of India (RBI) as Sub Agency for implementation of the RDSS through PFC (Central Nodal Agency) or as per the latest policy/ guidelines/ directives issued by Ministry of Power from time to time. All project related payments to the contractors/ agencies by DISCOM shall be done directly from the Assignment Account with RBI.

9. Regarding counterpart funding, DISCOM shall open a dedicated scheme account in a nationalized bank having E-banking facility or as per directions issued by MoP/ Nodal Agency. MoP/ Nodal Agency shall have the view right of the said Bank Account.

10. Any interest earned on grant shall be remitted to Ministry of Power's bank account on regular basis and at least once in a quarter.

11. Since grant under the scheme is Central Government money and DISCOMs are only the custodian of this money, income tax is not payable on interest earned on this money. DISCOMs shall take necessary steps to seek exemption from Income Tax Department regarding deduction of Tax at Source by the bank on interest accrued on un-utilized fund under the scheme. However, in case of deduction of TDS by bank, the Utilities shall claim refund of the deducted amount from Income Tax Department directly while filing annual tax return and remit it to Ministry of Power's account.

12. The Discom shall ensure that funds released under the scheme are utilized for the purpose for which it is released and will not be diverted for any other purposes whatsoever. In case of any breach or deviation further release of funds shall be stopped.

13. The grant release from Nodal Agencies to the DISCOMs shall be done through PFMS and the DISCOMs shall use PFMS for fund flows under the scheme. DISCOMs receiving funds under the scheme are to be registered / mapped in PFMS. The DISCOMs shall mandatorily enter details like receipts, expenditures, etc in Public Fund Management System (PFMS) portal. In case of non-entering desired details in PFMS portal, banks may not consider release of funds to Contractors.

14. DISCOM shall submit utilization certificates (UC) for the funds released during the financial year in prescribed format latest by 30th April of succeeding year in addition to the UC along with every claim.

15. DISCOMs shall maintain books of accounts both for receipt of funds from Nodal Agency and release to contractors for each of the project. The DISCOM shall ensure that fund shall not be invested in any other bank/branch, whether for short term or medium term, including fixed deposits.

General Terms and Conditions Applicable for Availing Financial Assistance under Revamped Distribution Sector Scheme

16. The DISCOM will ensure audit of the scheme accounts relating to receipts of funds from GoI / Nodal agency and expenditure incurred by the DISCOM against such receipts during the financial year by an independent Chartered Accountant and furnish a report to the Nodal agency latest by 30th June of the succeeding year.

17. The works and finances would be open to audit by the office of the Comptroller & Auditor General of India (C&AG) as well as Internal Audit Wing, Office of Controller of Accounts, MoP

18. **Recall of Grant:**

    18.1. If by the end of year 2025-26, a DISCOM is not eligible for release of any grant, the initial advance of 10% of the grant component of the cost of DPR for Loss Reduction will have to be refunded by the DISCOM.

    18.2. The Monitoring Committee is empowered to recall the grant released to the DISCOMs at any stage of the scheme, in case the sanctioned works are left incomplete, or the assets could not be put to use, or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines.

    18.3. Any unrecovered/ outstanding dues amount from earlier Schemes of Ministry of Power, GoI shall also be allowed to be adjusted against releases in the current Scheme.

19. In case loan component of the project cost is funded by the NBFCs under MoP, then in order to secure the loan, the existing TPA (Tri-partite Agreement) arrangement among Government of India, the State Government and the RBI shall be suitably amended to provide that the loan servicing payments in case of default can be recovered through RBI.

B. Project Implementation by Discom:

20. Mode of Implementation:

    20.1. **Metering**: These projects shall be implemented in TOTEX mode (Total expenditure includes both capital and operational expenditure) with the following options:

    a) Installation and commissioning of meters and cost recoveries in equated monthly instalments by PPP or implementation partner (or service provider) with no upfront payment by DISCOM

    b) Some initial payment shall be made to the service provider upon installation and commissioning of the meters, with the rest of the payments made on equated monthly / quarterly instalments over the operational period.

    20.2. **Distribution infrastructure works:** The projects shall be implemented normally on turnkey basis. However, certain works may be taken up on partial turnkey basis or departmentally with the approval of DRC and consent of Nodal Agency, subject to, overall guidance of the Monitoring Committee.

21. The scheme shall be implemented in accordance with the Ministry of Power's Office Memorandum No. 20/9/2019-IPDS dated 20th July, 2021, Scheme Implementation Agreement and operational guidelines issued including amendments/supplemental if any.

22. Discom to follow Standard bidding Document (SBD) as issued by Nodal Agencies for selection of AMI service provider, for Distribution infrastructure works, SCADA and PMA.

General Terms and Conditions Applicable for Availing Financial Assistance under Revamped Distribution Sector Scheme

23. The DISCOMs may make minor changes in the SBD, while retaining its basic structure and essence, provided that the approval of the Nodal Agency is taken for the changes, subject to, overall guidance the Monitoring Committee

24. Prepaid smart Metering projects taken up by DISCOMs through MOU route with CPSUs or their JVs and Subsidiaries shall also be permitted subject to their being implemented in TOTEX mode as per proposed model circulated by Ministry of Power vide letter No. 14/07/2021- UR&S-II-(E-260509) dated 19.01.2022.

25. Keeping in view the aims and objectives of Atma Nirbhar Bharat Abhiyan, Ministry of Power has issued Public Procurement (Preference to Make in India) for Purchase Preference (linked with local content) Order in respect of Power Sector on 28.7.2020. This order is in line with the DPIIT Notification No. P-45021/2/2017-PP(BE-II) dated 4th June,2020. This order along-with amendments, if any, from time to time, shall be followed by the DISCOMs in the implementation of the scheme. However, in case a DISCOM is availing funds through multi-lateral financial institutions, applicable DEA directives may be followed.

26. Discom may appoint one or more PMA for project management. Existing PMA of DDUGJY or Saubhagya or IPDS or PMDP or any other Central/State Govt scheme of power sector may be used for preparation of DPR and Action Plan, and the expenses incurred will be eligible under the scheme. For all other works including bid process, monitoring of implementation, project completion, result evaluation and related works, a new PMA will have to be appointed as per the SBD as circulated by the Nodal agency. DISCOMs desirous of appointing CPSUs or their JVs and subsidiaries as PMA on nomination shall be required to obtain a specific approval from the Ministry of Power through concerned Nodal Agency. Any such proposal would be sent by the DISCOM along with the imperative need along with a detailed justification.

27. The sunset date for the scheme will be 31.03.2026, the works executed beyond which will not be eligible for release of Central Government grant.

28. Discom to ensure updation of MIS web portal to be developed by the Nodal Agencies for submission of Action Plan & DPRs, capturing baseline data, physical & financial progress, quality reports, outcomes and achievements for evaluation under Result Evaluation Framework, closure, etc.

C. Result Evaluation Framework:

29. Discom to meet the pre-qualifying criteria and achieve the specified marks in the Evaluation Matrix based on which DPR for Modernisation & System Augmentation shall be sanctioned and grant for both loss reduction works (other than the advance for DPR for Loss Reduction) and for the Modernisation & System Augmentation works will be released.

30. For qualifying in the Evaluation Matrix, a DISCOM needs to score a minimum of 60 marks.

D. Monitoring & Evaluation

31. This scheme would be reviewed by the District Electricity Committees, to be notified by the State Government in compliance to the notification of Government of India dated 16th Sept, 2021.

32. The DISCOM shall be responsible & accountable for assuring quality in the scheme works. Accordingly, DISCOM shall formulate a comprehensive Quality Assurance (QA) and Inspection Plan with an objective to build quality infrastructure under the project. The QA and Inspection Plan shall be an integral Part of the contract agreement with turnkey contractor or equipment supplier/vendor and erection agency as the case may be in case of partial turnkey and departmental execution of works. Documentation with regard to Quality Assurance & Inspection Plan shall be maintained by DISCOM and kept in proper order for scrutiny during the course of project execution and for future reference. The DISCOM has to ensure that the quality of

material/equipment supplied at site and field execution of works under the project is in accordance with Quality Assurance & Inspection Plan. DISCOM may use the MQP (Manufacturing Quality Plan) and FQP (Field Quality Plan) used in DDUGJY and IPDS schemes by suitably modifying as per requirement of this scheme.

33. In addition to the in-house quality checks and processes followed by the DISCOM, the nodal agency (PFC/ REC) shall carry out concurrent inspection of works through Third Party Quality Monitoring Agency (TPQMA).

E. Interpretation

Any dispute arising out of this Agreement/ interpretation of any clause may be referred to Secretary (Power), Govt. of India whose decision shall be final and binding on all parties. In case of any inconsistency between the Terms and Conditions of this sanction letter and the provisions of RDSS Guidelines, the latter shall prevail.

Appendix-II

[This MoA is to be executed on Non-Judicial Stamp Paper of Rs 200/-]

IMPLEMENTATION AGREEMENT AMONGST
______ Limited, the Nodal Agency onbehalf of Ministry of Power, Government of India
AND
State Government,
AND
Power Utility

For Implementation of Revamped Distribution Sector Scheme

This TRIPARTITE MEMORANDUM OF AGREEMENT (hereinafter referred to as the **"Implementation Agreement")** is made this .... day of ....20....

BY AND AMONGST

______ Limited, A Government of India Undertaking, having its Registered Office at ____________ (hereinafter referred to as "**Nodal Agency**" or "**_____**") part on behalf of Ministry of Power, Government of India, which expression shall unless it be repugnant to the subject or context thereof, include its successors and assigns, of the **FIRST PART;**

AND

State Government of....................... (hereinafter referred to as "**State Government**") which expression shall unless it be repugnant to the subject or context thereof, include its successors and assigns, of the **SECOND PART**

AND

.... *[Distribution Company]* having its Head/Registered Office at .... (hereinafter referred to as **"DISCOM"** which expression shall unless repugnant to the context or meaning thereof includes its successors and assigns) of the **THIRD PART**.

The Nodal Agency, the State Government, and the Utility are hereinafter also referred to collectively as the **"Parties"** and individually as the **"Party"**.

WHEREAS the Government of India has launched **Revamped Distribution Sector Scheme** (hereinafter referred to as "**RDSS**") as a Central Sector Scheme to improve the operational efficiencies and financial sustainability, by providing financial assistance to DISCOMs for strengthening of supply infrastructure. The DISCOM can take up projects relating to installation of prepaid smart meters for all consumers along with associated AMI, communicable meters for DTs & Feeders to enable automated Energy Audit and Accounting, SCADA, DMS & RT-DAS, Enterprise Resource planning (ERP) and other ICT initiatives, and Distribution infrastructure works as required for strengthening and modernizing the system as well as measures for loss reduction with the end objective of reducing losses and ensuring 24 x 7 power supply , Public Charging Infrastructure for Electric Vehicles (EVs), Disaster Resilient Infrastructure works (hereinafter referred to as the "**Project**") on the terms & conditions contained in the **Order No. F. No. 20/9/2019-IPDS dated 20.07.2021 issued by Ministry of Power and RDSS guidelines and any amendments thereto issued by the nodal agency.**

NOW IT IS HEREBY AGREED BY AND BETWEEN THE PARTIES HERETO as follows:

1. This Agreement signed between (a) ______ Limited, the Nodal Agency on behalf of Ministry of Power, Government of India;(b) State Government and (c) Discom for implementation of Revamped Distribution Sector Scheme shall be implemented by the Discom in letter and spirit. Government of India will monitor implementation of the precedent conditions agreed to upon in this Agreement before releasing funds through Nodal Agency.

2. This Agreement shall be read in accordance with the provisions of **Order No. F. No. 20/9/2019-IPDS dated 20.07.2021 issued by Ministry of Power and RDSS guidelines and any amendments thereto issued by the nodal agency**. The said RDSS Guidelines shall form an integral part of this agreement as Annexure – 'A' as if fully set forth hereunder and all the terms and conditions set out in the said Revamped Distribution Sector Scheme Guidelines shall be binding on the Parties hereto.

3. The parties have agreed that the individual project(s), as proposed by DISCOM and sanctioned by the Monitoring Committee (MC) /nodal agency, under Revamped Distribution Sector Scheme (RDSS), commencing from the financial year 2021-22 shall be deemed to have been covered under this agreement. The terms and conditions of sanction by the MC/nodal agency for a particular project, as contained in the sanction letter (including the supplementals, modifications if any) issued by the nodal agency, shall also form part and parcel of this agreement.

4. DISCOM has to formulate, plan, design, develop and implement the projects in accordance with the Standard Bidding Documents for various components as circulated by Nodal agencies and in line with the Central Vigilance Commission (CVC) guidelines. Also, guidelines, SBDs, specifications and construction standards shall be adopted wherever applicable.

5. State Government and DISCOM agree that in the event the projects are not implemented satisfactorily in line with the sanction terms and conditions, left incomplete or the assets could not be put to use, or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines then Monitoring Committee is empowered to recall the grant released to the DISCOMs at any stage of the scheme.

6. State Government and DISCOM agree that performance in the Reforms Based Results Linked Revamped Distribution scheme would also form integral part of the financing norms of PFC, REC, Banks/FIs and MDBs for any project in the Distribution Sector even beyond those related to funding under this scheme.

7. State Government and DISCOM agree that if due to adverse performance in the Reforms Based Results Linked Revamped Distribution scheme, funds does not get released then any advance amount released shall be refunded to the Government of India.

8. **PROJECT FINANCING**

i) **For Smart Metering works:**

The financial support under the scheme shall be as under:

a) 15% of sanction cost limited up to Rs.900 per meter for Consumer metering would be provided as grant by Government of India (22.5% for special category limited to Rs.1350)

b) The implementation of the metering scheme is proposed through PPP on TOTEX mode. State Government/DISCOM may also provide budgetary support in TOTEX mode.

c) An incentive of 7.5% (11.25% for special category) of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter (Rs.675 for special category), whichever is lower, would be provided for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023. The decision of Monitoring Committee shall be final while calculating Additional grant applicable to any project under the Scheme.

d) The consumer meters shall mandatorily be prepaid meters to be eligible for availing grant under the scheme.

e) Discoms shall ensure Feeder/DT metering in accordance with the requirements of the scheme/ directions of MOP

ii) **For Distribution Infrastructure works:**

a) The sanction of DPR for Modernisation & System Augmentation and release of grant for both loss reduction works (other than the advance) and for the Modernisation & System Augmentation works will be based on the DISCOM meeting the pre-qualifying criteria and achieving the specified marks in the Evaluation Matrix. Also, Monitoring Committee will issue sanctions of loss reduction works contingent to sanctions of metering works being already in place; or, Smart metering works being already implemented by the DISCOMs in line with the SBD for Smart prepaid metering in TOTEX mode; or together, as the case may be.

b) The financial support under the scheme shall be as under:

- ❖ The grant shall be restricted to 60% (90% for special category) of sanction cost or award cost or executed cost (excluding State & local taxes) whichever is lower *(this lowered cost herein after shall be referred to as 'Sanction cost')*. The state & local taxes are not admissible under RDSS and to be borne by the State Government/Discom

- ❖ 40% (10% for special category) of sanction cost shall be either loan from Financial Institutions (REC/PFC or MDBs) or own funds of State Government. REC/PFC shall consider offering loans at competitive interest rates for the RDSS scheme.

iii) Cost overruns beyond sanction cost, if any, and PMA charges beyond allowed GOI grant shall be borne by the State Government/Discom.

iv) To be eligible for grant, State Government/Discom has to follow the SBD circulated by the nodal agency or obtain specific approval of Nodal agency for deviations.

v) State Government to arrange for DISCOM contribution in case DISCOM fails to arrange the same;

vi) State Government to furnish guarantee for the loan component under the scheme in case the DISCOM is not able to provide any other mode of security.

vii) Directives of Ministry of Power in this regard if any, would be followed.

9. Funds

i) The release of the fund shall be as per the clause 5.2 of the operational guidelines of RDSS. The terms & conditions of release of funds for a particular project as contained in operational guidelines issued, shall also form part of the present agreement. The guidelines shall include supplementals and modifications issued, if any. The releases will be subject to the deductions as agreed amongst Nodal Agencies, State Government and Discom, as per RDSS guidelines or statutory requirements.

ii) State Government/ Discom commits to refund grant component released to Utility in case of non-compliance of RDSS guidelines/ this agreement or poor progress resulting to short-closure/ cancellation.

iii) MoP/ Monitoring Committee is empowered to recall the grant released to the DISCOMs at any stage of the scheme, in case the sanctioned works are left incomplete or the assets could not be put to use or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines. Further, if by the end of year 2025-26, a DISCOM is unable to get any fund released due to non-fulfillment of performance criteria of the scheme,, the initial advance of 10% will have to be refunded by the DISCOM. Any unrecovered/due amounts from earlier schemes of Ministry of Power, GOI shall also be allowed to be adjusted against releases in the current scheme till 2025-26.

iv) In order to secure the loan of NBFCs under MoP, the existing TPA (Tri-partite Agreement) arrangement among Government of India, the State Government and the RBI shall be suitably amended to provide that the loan servicing payments in case of default can be recovered through RBI.

v) DISCOMs shall maintain books of accounts both for receipt of funds from Nodal Agency and release to contractors for each of the project.

vi) DISCOM shall ensure that fund shall not be invested in any other bank/branch, whether for short term or medium term, including fixed deposits.

10. Opening of Bank Account

i) DISCOM (Implementing Agency) shall open an Assignment Account with NDRO, Reserve Bank of India (RBI) as Sub Agency for implementation of the RDSS through PFC (Central Nodal Agency) or as per the latest policy/ guidelines/ directives issued by Ministry of Power from time to time. All project related payments to the contractors/ agencies by DISCOM shall be done directly from the Assignment Account with RBI. Regarding counterpart funding, DISCOM shall open a dedicated scheme account in a nationalized bank having E-banking facility or as per directions issued by MoP/ Nodal Agency. MoP/ Nodal Agency shall have the view right of the said Bank Account.

ii) State Government/Discom shall enter details like receipts, expenditures, etc in Public Fund Management System (PFMS) portal. In case of non-entering desired details in PFMS portal, banks may not consider release of funds to Contractors.

11. Distribution Reforms Committee

i) State Government shall setup a Distribution Reforms Committee (DRC), headed by the Chief Secretary, Secretary in charge of the Energy/Power Department of the State as the convener and consisting of Secretary (Finance), Secretary (Land Revenue) and Secretary (Forest and Environment) as its members. The roles and responsibilities of Distribution Reforms Committee (DRC) are mentioned in clause 7.4 of the operational guidelines of RDSS.

12. DISTRICT ELECTRICITY COMMITTEE (DEC):

i) State Government shall also setup a District Electricity Committee (DEC) as per the Ministry of Power letter no. 42/17/2011-RE [206787] dated 26.09.2021. The Committee shall meet periodically at District headquarters at least once in 3 months to review and coordinate overall development of power supply infrastructure in the district in accordance with the schemes of Government.

ii) State Government shall also facilitate participation of Public Representatives in the inauguration events etc.

13. PROJECT MANAGEMENT

i) Project Management Agency (PMA) shall be appointed by Discom/Power Department to assist them in project management to ensure timely implementation of the project. PMA charges, restricted to 2.5% of the GBS of component I - metering and 1.5% of project cost of component II - Distribution infrastructure works, shall be sanctioned as a separate component of the scheme. PMA charges, over and above the permitted amount shall be borne by the respective DISCOM/ Government.

ii) State Government shall ensure Reforms support in the form of consultancy for Discoms and payments thereof.

iii) State Government/Discom shall ensure establishment of a dedicated project implementation cell at district level and a centralized cell at Head office level.

14. CONSTRUCTION / IMPLEMENTATION

i) State Government/Discom shall make all possible efforts to complete the project(s) within the approved time frame starting from the date of award of project. State Government to provide required land for substations and facilitate in obtaining other statutory clearances (ROW, forest etc.);

ii) State Government/Discom to ensure following Public Procurement (Preference to Make in India) for Purchase Preference (linked with local content) Order in respect of Power Sector dated 28.7.2020 or its latest amendments thereof. DEA directives to be followed in case funds are availed through multi-lateral financial institutions.

iii) State Government/Discom shall suitably incorporate the provisions towards levy of Liquidated Damages in their agreements with contractors for delay in completion of the project(s) and also other relevant contractual provisions pertaining to the procurement of goods and works. Out of the amount recovered towards Liquidated Damages, if any, by State Government/Discom under this provision, the amount proportionate to subsidy shall be remitted to MoP account.

iv) During implementation of projects, State Government/Discom shall be solely responsible & accountable for assuring quality in RDSS works. State Government/Discom shall formulate a comprehensive Quality Assurance (QA) and Inspection Plan with an objective to build Quality Infrastructure under RDSS works. The QA and Inspection Plan shall be an integral Part of the contract agreement with turnkey contractor or equipment supplier/vendor and erection agency as the case may be in case of partial turnkey and departmental execution of works.

v) State Government/Discom shall also ensure that the quality of material/equipment supplied at site and field execution of works under the project is in accordance with Quality Assurance & Inspection Plan.

vi) State Government/Discom to ensure submission of updated monthly physical and financial progress of the project to the Nodal Agency including its updation on the web portal.

vii) State Government/Discom shall ensure submission of geotagged photographs of the assets created under the scheme and same shall be uploaded in the portal while submitting the progress and claims. The detailed methodology shall be provided by the Nodal agency.

viii) State Government/Discom shall ensure that there is no duplication / overlapping of works with any other Government of India and State scheme.

ix) Appropriate third party/parties will be appointed by MOP / Nodal Agencies to assess / verify the achievements of DISCOMs with respect to the action plan finalized on periodical basis using the Result Evaluation Framework.

x) The projects shall be awarded and implemented within the time frame as per guidelines on turn-key basis through e-tendering in accordance with the prescribed Procurement Policy, Standard Bidding Document and Technical Specifications / amendments thereof.

xi) For metering, Standardization Testing and Quality Certification (STQC) & Cyber security aspects have to be mandatorily included in the contract, while following Government of India's stipulations related to source of procurement.

15. UTILISATION CERTIFICATE

i) State Government/Discom shall submit Utilization Certificate (UC) for the funds released during the Financial year and utilization thereof in prescribed format, latest by 30th April of succeeding year. The UC shall provide the physical progress/achievements also apart from financial utilization. Utilization Certificate is also mandatory to be submitted for every disbursement. The prescribed format of UC shall be furnished by the Nodal agency.

16. ARBITRATION

i) Any differences or dispute among the parties arising out of or in connection with this project shall be discussed and settled amicably amongst the parties. In the event of non-settlement of the difference or dispute within sixty (60) days, the same shall be referred to the Secretary to the Government of India in the Ministry of Power, as the sole arbitrator whose decision shall be final and binding on the parties to this Agreement.

17. FORCE MAJEURE

i) The parties shall ensure due compliance with the terms of this Agreement. However, no party shall be liable for any claim for any loss or damage whatsoever arising out of failure to carry out the terms of the Agreement to the extent that such a failure is due to force majeure events such as fire, rebellion, mutiny, civil commotion, riot, strike, lock-out, forces of nature, accident, act of God and any other reason beyond the control of concerned party. But any party claiming the benefit of this clause shall satisfy the other party of the existence of such an event and give written notice of 30 days to the other party to this effect. The services covered under this Agreement shall be started as soon as practicable by the parties concerned after such eventuality has come to an end or ceased to exist.

18. IMPLEMENTATION OF THE AGREEMENT

i) All discretions to be exercised and directions, approvals, consents and notices to be given and actions to be taken under these presents, unless otherwise expressly provided herein, shall be exercised and given by the signatories to this Agreement or by the Authorized representative(s) that each party may nominate in this behalf and notify in writing to the other party by Registered Post. Any other nomination of Authorized representative(s) and/or changes in designation shall be informed likewise in writing to/by State Government/Discom and PFC within one month of signing of the Agreement. Any changes in designations/ registered office address shall be intimated in writing to all concerned parties.

ii) In case of any inconsistency between the Terms and Conditions of this Agreement and the provisions of RDSS Guidelines, the latter shall prevail.

iii) Any dispute arising out of this Agreement/interpretation of any clause may be referred to Secretary (Power), Govt. of India whose decision shall be final and binding on all parties.

19. NOTICE

i) All notices required or referred to under this Agreement, shall be in writing and signed by the respective authorized signatories of the parties mentioned herein above, unless otherwise notified. Each such notice shall be deemed to have been duly given if delivered or served by registered/speed post of Department of Posts to the respective heads on the addresses mentioned in the recital.

20. VALIDITY & TERMINATION

i) This agreement shall remain valid until all liabilities and obligations of the Discom pertaining to the RDSS scheme implementation are discharged to the satisfaction of the Nodal Agency/Ministry of Power.

ii) This agreement shall remain valid unless terminated with consent of all the Parties.

21. JURISDICTION

The competent Courts of Delhi shall have exclusive jurisdiction in all matters relating to or arising out under these presents.

IN WITNESS WHEREOF the parties have executed these presents through their Authorized Representatives at ______________________.

SIGNED AND DELIVERED BY (on behalf of **STATE GOVT. OF ....**) **Signature ....** **Name & Designation ....** **Address ....** **...**	in the presence of .... Signature .... Name & Designation .... Address ....
SIGNED AND DELIVERED BY (on behalf of **UTILITY................................**) **Signature ....** **Name & Designation ....** **Address**	in the presence of .... Signature .... Name & Designation .... Address ....
SIGNED AND DELIVERED BY **Power Finance Corporation Ltd** (on behalf of **Ministry of Power, Govt. of India**) **Signature ....** **Name & Designation ....** **Address**	in the presence of .... Signature .... Name & Designation .... Address ....

Annexure-F

Acceptance Letter

(From Government of ………………………..)

No. Dated:

………………

The Chairman & Managing Director,
Power Finance Corporation Limited,
Urjanidhi, 1 Barakhamba Lane
Connaught Place,
New Delhi-110001

Sub: Acceptance of financial assistance to <DISCOM> for implementation of Projects under RDSS Scheme (Grant Nos. ________and PMA Grant No- _____) and terms and conditions for implementation of projects under RDSS

This is with reference to your sanction letter No………………………………………… dated: …………….. conveying approval of Action Plan and DPRs for sanction of project cost of Rs………………..Cr. for implementation of prepaid Smart metering works & Rs………. for implementation of Infrastructure works under Loss reduction in……………. <DISCOM> under RDSS scheme.

The Government accepts the Action Plan and above sanctions on the terms and conditions as set out in the sanction letter under reference above and RDSS guidelines..

District wise and Project area wise bifurcation of work and project cost approved for Infrastructure – Loss reduction works etc. shall be submitted by <Discom> within 15 days of this letter as per the requirement of MOP/ Nodal Agency.

Yours faithfully,

(Authorized Officer)
State Government

Annexure-C

GUIDELINES

REVAMPED DISTRIBUTION SECTOR SCHEME

REFORMS-BASED AND RESULTS-LINKED

Nodal Agency **Nodal Agency**

Abbreviations

ABC	Aerial Bunched Cable
ACS	Average Cost of Supply
AI	Artificial Intelligence
AMI	Advanced Metering Infrastructure
AMR	Automated Meter Reading
AT&C	Aggregate Technical and Commercial
ARR	Average Revenue Realised
DBFOOT	Design Build Finance Own Operate & Transfer
DBT	Direct Benefit Transfer
DMS	Distribution Management System
DRC	Distribution Reforms Committee
DPR	Detailed Project Report
DT	Distribution Transformer
EMD	Earnest Money Deposit
ERP	Enterprise Resource Planning
FI	Financial Institution
FMS	Feeder Monitoring System
GBS	Government Budgetary Support
HVDS	High Voltage Distribution System
ICT	Information and Communication Technology
IT	Information Technology
LD	Liquidated Damages
MBC	Metering, Billing and Collection
MDB	Multilateral Development Bank
ML	Machine Learning
MSME	Micro, Small and Medium Enterprises
MYT	Multi Year Tariff
NBFC	Non-Banking Financial Company
NFMS	National Feeder Monitoring System
OT	Operational Technology
PMA	Project Management Agency
PPP	Public Private Partnership
RPO	Renewable Purchase Obligation
T&D	Transmission & Distribution
ToD	Time of Day
TOTEX	Total Expenditure
TPA	Tripartite Agreement
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SBD	Standard Bidding Documents
STQC	Standardization Testing and Quality Certification
UG	Under-ground
UT	Union Territories

Chapter 1. Introduction

1.1 A well-functioning electricity infrastructure is essential for the success of a modern economy. 24x7 availability of reliable, quality and affordable power is key to economic development of the country. Power Sector has witnessed tremendous growth over the past five years in generation, transmission and universal access to electricity. India is surplus in power generation today. The continued progress in inter-state and intra-state transmission network has removed transmission bottlenecks and created sufficient transmission capacity to transmit electricity generated from one region to another.

1.2 In the Distribution Sector, Government of India has been assisting the States / Distribution Companies (DISCOMs) through various schemes since 2014, namely Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY); Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA); and Integrated Power Development Scheme (IPDS). The Distribution system has been strengthened under DDUGJY and IPDS in rural and urban areas respectively. As a result of the implementation of these schemes, India has achieved universal electricity access by connecting ~28 million households in 18 months under Saubhagya. This was the largest expansion of access anywhere in the world in such a time frame.

1.3 Implementation of these schemes has also resulted in improved access to electricity. An independent survey shows that an average Indian household gets almost 20.6 hours of power supply every day, with urban areas getting 22-24 hours and rural areas getting 20 hours. Steps have also been taken for automation and use of Information Technology (IT) in Distribution Sector under IPDS and R-APDRP which includes the establishment of Data Centres, GIS mapping of consumers, Asset Mapping, Online energy auditing & accounting, Consumer care centres, AMI meters on feeders & Distribution Transformers, provision of Smart Metering to reduce losses etc. in urban areas.

1.4 Despite the above measures, consumers do not get reliable 24x7 electricity in many parts of the country. Aggregate Technical and Commercial (AT&C) losses and the Average Cost of Supply-Average Revenue Realized (ACS-ARR) gap continue to be high. This sub optimal performance of the Distribution Sector is due to structural and management deficiencies and some remaining weaknesses in the infrastructure. The DISCOMs need to focus on improving their operational efficiencies & financial sustainability; and improve consumer services to be able to meet the desired consumer service standards.

1.5 The above requires large scale reforms in Distribution Sector and schemes that would enable the DISCOMs to reduce losses to make them financially sustainable and operationally efficient.

1.6 It is with this aim and the Government of India’s commitment for providing 24x7 uninterrupted, quality, reliable and affordable power supply, that the Revamped Reforms Based and Results Linked Distribution Sector Scheme has been formulated by Ministry of Power for supporting DISCOMs to undertake reforms and improve performance in a time bound manner.

1.7 The Revamped Reforms-based and Results-linked, Distribution Sector

Scheme seeks to improve the operational efficiencies and financial sustainability, by providing financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks in reforms.

1.8 The Revamped Distribution Sector Scheme has the following parts:

1.8.1 **Part A – Metering & Distribution Infrastructure Works:**

- Facilitating in installing prepaid smart meters for all consumers along with associated AMI, communicable meters for DTs & Feeders, ICT including Artificial Intelligence (AI), Machine Learning (ML), etc. based solutions for power Sector and a unified billing and collection system[1];
- Distribution infrastructure works as required for strengthening and modernizing the system as well as measures for loss reduction. The infrastructure strengthening works will include separation of Agriculture feeders to enable implementation of the KUSUM scheme, Aerial Bunch cables and HVDS for loss reduction, replacement of HT/LT lines as required, construction of new/ upgradation of substations, SCADA and DMS system etc. Each DISCOM/ State will draw up the scheme according to its requirement with the end objective of reducing losses and ensuring 24 x 7 supply.

1.8.2 **Part B - Training & Capacity Building and other Enabling & Supporting Activities:** Supporting and enabling components, such as Nodal Agency fee, enabling components of MoP (communication plan, publicity, consumer awareness, consumer survey and other associated measures such as third-party evaluation etc.), up-gradation of Smart Grid Knowledge Centre, training and capacity building, awards and recognitions etc.

1.9 **Ongoing approved projects**: Schemes of IPDS, DDUGJY along with PMDP-2015 for the erstwhile State of Jammu & Kashmir are being subsumed in this scheme to be implemented as per their extant guidelines and under their existing terms & conditions. No new projects will be sanctioned under these schemes but projects already sanctioned under IPDS & DDUGJY will be eligible to receive funds up to 31st March 2022 under this scheme. However, projects sanctioned for Ayodhya, Uttar Pradesh under IPDS and also projects sanctioned under PMDP 2015 will get funds till 31st March 2023.

1.10 The Revamped Reforms based and Results Linked Distribution Sector Scheme will have an outlay of Rs.3,03,758 crore with an estimated GBS from Central Government of Rs.97,631 crore. It is envisaged that about Rs. 200 crores will be spent by the State Governments towards reforms support in the form of consultancy.

1.11 Office Memorandum issued by the Ministry of Power in respect of Reforms

[1] Nodal Agency / MoP may develop a unified billing and other software, which may be utilized by the Government DISCOMs / Power Departments of the country (as may be decided by Monitoring Committee), keeping in view issues such as interoperability, data security, and consumer privacy, which shall be optional for DISCOMs to use.

based and Results Linked Distribution Sector Scheme is enclosed as **Appendix-I.**

1.12 These guidelines shall be applicable for the clause 1.8 of the scheme. The existing operational Guidelines/ Standard documents/ procedures shall continue to prevail for implementation of projects sanctioned under DDUGJY, IPDS & PMDP.

Chapter 2. Objectives, Eligible Works and Eligible Entities

2.1 Objectives

2.1.1 The objectives of the scheme are to:

- Improve the quality, reliability and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector.
- Reduce the AT&C losses[2] to pan-India levels of 12-15% by 2024-25.
- Reduce ACS-ARR[3] gap to zero by 2024-25.

The state-wise targets for each year will depend on their current levels of AT&C losses and ACS-ARR gap.

2.2 Parts of the Scheme

2.2.1 The Scheme has the following parts -

- **Part A**
  - Component I: Metering
  - Component II: Distribution Infrastructure Works
  - Component III: Project Management
- **Part B**: Training, Capacity Building and other Enabling & Supporting Activities.

2.3 Eligible Works and Activities under Part A - Metering

2.3.1 Under this part, Prepaid Smart metering for consumers, and System metering at Feeder and Distribution Transformer level with communicating feature along with associated Advanced Metering Infrastructure (AMI) will be done in TOTEX mode through PPP, to facilitate reduction of Distribution losses and enable automatic measurement of energy flows and energy accounting as well as auditing.

2.3.2 Funding under this Part will be available only if the DISCOM agrees to the operation of smart meters in prepayment mode for consumers, and in accordance with the uniform approach indicated by the Central Government, with implementation in TOTEX mode. Under this mode, a single agency will be contracted for supplying, maintaining and operating the metering infrastructure for the purpose of meter related data and services to the DISCOM. It will make both capital and operational expenditure under DBFOOT (Design Build Fund Own Operate & Transfer) or similar modes and will be paid for a portion of its capital expenditure initially and the remaining payment over the O&M period.

[2] AT&C losses will be calculated by Power Finance Corporation as per the latest approved formula.
[3] ACS-ARR gap for the purpose will be calculated by Power Finance Corporation on subsidy received basis duly adjusted for UDAY grants, and regulatory income, if any.

2.3.3 Pre-paid smart metering works carried out after 1st January, 2020 will be eligible for funding, if they were carried out in TOTEX mode, after obtaining approval from Monitoring Committee in this regard.

2.4 Eligible Works and Activities under Part A- Distribution Infrastructure Works

2.4.1 Under this component, DISCOM can take up works related to loss reduction and system strengthening. 33kv level and below will be eligible under this component. In areas, were 33kv system does not exist, 110 kV/66kV shall be permitted. A list of indicative works is given below:

i. Construction of new substations, augmentation of substations

ii. Provision of Armoured / Aerial bunched Cables (ABC) or High Voltage Distribution System in high loss areas.

iii. Segregation / Bifurcation of feeders and other allied works

iv. Replacement of conductors, which are old/frayed

v. Additional HT lines to improve quality of supply

vi. IT/OT works

vii. Supervisory Control and Data Acquisition (SCADA) and Distribution Management System (DMS) in urban areas

- SCADA/DMS in 100 towns (approx.) with eligibility of towns having population > =1 Lacs in special category states and towns having population > = 2.75 Lacs in other states as per Census 2011 data, as well as all Capital/DISCOM HQ towns, if not covered earlier.
- Basic SCADA in 3875 towns based on district-wise or Circle-wise common control centres in all other statutory towns

viii. Works like new feeders, capacitors, etc for loss reduction

ix. Under-ground cabling works

x. Any other works required for system strengthening and loss reduction

2.4.2 Segregation of feeders dedicated only for supply of power for agricultural purpose, which are proposed to be solarized under Kisan Urja Suraksha Evam Utthan Mahabhiyan (KUSUM) scheme will be sanctioned on priority under the scheme. Further, agricultural feeders once segregated will not be used for serving other non-agricultural consumers.

2.5 Scope of Work under Part A- Project Management

2.5.1 One or more Project Management Agency (PMA) shall be appointed by each DISCOM for project formulation and project management, based on their requirement to cover different phases of the project. The scope of PMA may include preparation of plan, DPR, tender documents, awarding, monitoring, quality assurance, material inspection, results evaluation or any other related works. (excluding signing of Joint Measurement Certificate).

2.6 Eligible entities for Part A

2.6.1 All State-owned Distribution companies and State /UT Power Departments (referred to as DISCOMs collectively) excluding private Sector power companies will be eligible for financial assistance under the revamped scheme. The State transmission utilities which own and operate network at 110 kV and 66 kV levels in areas where 33 kV system does not exist shall also be eligible (for this purpose, all eligibility, and other relevant parameters of respective DISCOMs shall be evaluated) Further, funds release and any coordination shall be through DISCOM only, for such works to be executed in the specific manner by the transmission utility).

2.6.2 The scheme would be optional to DISCOMs and will be implemented in urban and rural areas of all States/UTs except private DISCOMs.

2.7 Eligible Works and Activities under Part B - Training, Capacity Building and other Enabling & Supporting Activities

2.7.1 Part B focuses on the softer parts – up-gradation of human skills; process improvements; Nodal Agency fee, enabling components of MoP (communication plan, publicity, consumer survey, consumer awareness and other associated measures such as third-party evaluation etc), augmentation of Smart Grid Knowledge Centre including AI, training and capacity building for personnel involved in execution of the Scheme at field level, awards and recognitions etc.

2.8 Same works sanctioned under any other scheme of the Government of India will not be eligible for funding under this scheme.

Chapter 3. Project Formulation and Approval

3.1 Formulation of Action Plan

3.1.1 Applicant DISCOM will prepare an Action plan for strengthening its Distribution system and improving its performance by way of various reform measures, which would result in improvement in their operational efficiency and financial viability as well as improve the quality and reliability of power supply to the consumers. Each DISCOM will prepare an Action plan, with several subcomponents for strengthening its Distribution system, and to improve their performance. Works that are required for AT&C loss reduction would be given priority.

3.1.2 The first part of the action plan will analyze the reasons/ root cause for losses, and list out the steps which will be taken for the reduction of losses and ACS-ARR gaps, and the time frame for taking these steps. The first part would also include the reform measures for financial viability and operational efficiency of DISCOMs as well as annual Results, Outcomes and Evaluation framework for the scheme period.

3.1.3 The second part of the action plan will list out the need assessment and the work plan for loss reduction. The Work plan arising out of the analysis shall be detailed under metering and infrastructure works.

3.1.4 The Action plan will be formulated by the DISCOM in consultation with the Nodal Agency/Ministry of Power. The action plan will be submitted by the DISCOM to the Nodal Agency on the recommendation of the Distribution Reforms Committee (DRC)[4] and with the approval of the State Cabinet.

3.1.5 **Action Plan - I : Analysis of losses, Reform measures for financial viability, timelines, and Results Evaluation Framework**

3.1.5.1 This part will contain the analysis of the reasons for losses and describe the measures that will be taken for the reduction of AT&C losses and ACS-ARR gap, along-with the time frame for taking up these measures. DISCOM will specify activities and reforms they/ State Government will undertake to improve their performance in this part of the action plan.

3.1.5.2 These activities and reform measures will be finalized on basis of its operational and financial data and will be worked out to address DISCOM-specific problems. For example, if AT&C losses in a DISCOM are high, then root cause analysis, solutions proposed to be undertaken to address each of such causes and AT&C losses reduction trajectory should be indicated in the Action Plan.

3.1.5.3 Similarly, if the ACS-ARR gap is high, the reasons and activities to reduce the gap along with the trajectory for gap reduction need to be a part of the Action

[4]All States have already set up Distribution Reforms Committee (DRCs), which have been according approvals to the projects proposed by DISCOMs under scheme like IPDS to the Nodal Agency for approval. The same has been detailed in Chapter 7.

Plan. Likewise, all other problems impacting viability should be addressed in Action Plan - I.

3.1.5.4 An indicative list of reforms / activities is given below:

i. Putting in place a mechanism to ensure that the Government Departments pay for the for electricity consumed, promptly.

ii. Putting in place a mechanism for ensuring that the consumption by the subsidized categories is accounted properly and released to the DISCOM in advance as mandated by Section 65 of the Electricity Act 2003, which will be credited to the consumer account maintained by the DISCOM. Subsidy delivery must be targeted via Direct Benefit Transfer (DBT) for improvement in accountability regarding which the DISCOM shall maintain proper accounts to ensure right targeting of subsidy and its delivery to the respective beneficiaries.

iii. Tariff reforms, including annual tariff fixation, rationalization of consumer categories, and no Regulatory Assets to be created.

iv. Progression towards cost reflective tariffs, including timely filing of tariff petitions, MYT and timely issuance of tariff orders.

v. Preparation of and adherence to a roadmap for funding accumulated and current financial losses and clearance of part or whole of regulatory assets through tariff or state funding.

vi. Corporate Governance reforms, Operation of part or whole area of supply of DISCOM through private participation or through CPSUs/JVs of CPSUs.

vii. Distribution Franchisee arrangements in some areas of DISCOM.

viii. Setting up electricity police stations in line with the provisions of the Electricity Act, 2003 by the State Government out of its own resources.

ix. Training and Capacity Building of existing manpower, Creation of IT wing within DISCOM for management of IT/OT services or engaging knowledge partners / consultants for the same.

x. Energy Accounting with 100% feeder and transformer metering on TOTEX mode.

xi. Compliance of RPO trajectories.

xii. Publication of quarterly audited/unaudited accounts along with reports in a standardized format circulated by PFC. Quarterly and Annual Accounts of DISCOMs need to explicitly include details of subsidy and Govt. Dept. dues. The annual accounts of the previous year would be published by DISCOMs latest by September 30th of the current year (or as per timelines permitted in pre-qualification criteria).

xiii. Initiation of performance linked transfer policy for DISCOM staff.

xiv. Provision of Armoured / Aerial bunched Cables (ABC) or High Voltage

Distribution System in high loss areas

xv. Collection efficiency trajectory should be worked out to achieve the national target of at least 98%.

xvi. Billing efficiency trajectory should be worked out to achieve the national target of at least 85% - 90%.

xvii. Any other activity which serves to achieve the objective of the scheme.

3.1.5.5 The part should inter-alia lay down the road map for bringing down AT&C losses and reducing ACS-ARR gap to zero by 2024-25 and project the requirement of financial support required from the State Government towards payment of Government dues and subsidies each year for the entire scheme duration. Recognizing the fact that every DISCOM has its own set of problems, the plan should be tailor-made to each DISCOM's requirements with a mapping of the problems and solutions clearly demarcated.

3.1.5.6 Outcome and output parameters along with their year-wise targets with respect to the baseline data, weightage and marks shall be spelt out in this part in the form of a Results Evaluation Matrix. The details of results evaluation framework are given in Chapter 4. The baseline data related to AT&C losses, ACS-ARR gap and other parameters shall pertain to the base year i.e. FY 2019-20 or FY 2020-21, for which audited accounts are available at the time of submission of Action plan. It is acknowledged that parameters of FY 2020-21 may not reflect the correct picture because of the pandemic. For parameters, where the FY 2020-21 figures do not reflect the correct picture in view of the unprecedented circumstances, targets for outcomes for the succeeding years may be set accordingly considering the figures for FY 2019-20 and FY 2020-21 for reasons to be recorded in writing. Wherever, data is available in the audited annual accounts, the same shall be used for evaluation purpose.

3.1.6 Action Plan - II – Metering and Distribution Infrastructure Works

3.1.6.1 Based on the analysis in Action Plan – I, DISCOM will spell out major works for components of Part A of the scheme, namely metering including energy accounting and Distribution infrastructure works along-with their estimated cost.

3.1.6.2 Installation of Prepaid Smart Meters and System Meters shall be taken up in phases as per priority given in Para 3.2.2.2.

3.1.6.3 Distribution infrastructure works that are required for AT&C loss reduction shall be given priority. Works for improving the quality and reliability of the power supply shall also be taken up. The indicative list of works that can be taken up has been detailed in Chapter 2.

3.2 DPR Formulation

3.2.1 DPRs will be prepared by the applicant DISCOM with details of the works to be undertaken along with the estimated cost as per Action Plan - II. DPR, with approval of DRC and in accordance with Action Plan approved by State Cabinet, shall be submitted by the DISCOMs to the Nodal Agency.

3.2.2 **Metering**

3.2.2.1 The DPR under Action plan - II for prepaid Smart metering will be submitted DISCOM wise to cover consumer and system metering at Feeder and DT level including operation and maintenance for a period as mentioned in the SBD. Different components may be packaged in two or more DPRs.

Consumer metering

3.2.2.2 With the objective of balancing the cost & benefits of prepaid smart meters and to reap the benefits of economies of scale, it has been decided that implementation of such meters shall be taken up in mission mode in identified contiguous areas.

The following areas will be taken up on priority for prepaid smart metering of all directly connected meters and AMI in case of other meters (other than agricultural consumers) in the first phase to be completed by December, 2023:

- All Union Territories
- All Electricity Divisions of 500 AMRUT cities, with AT&C Losses > 15% in the base year;
- Industrial and Commercial consumers;
- All Government offices at Block level and above;
- Other areas with high losses, which shall mandatorily include Electricity Divisions having more than 50% consumers in urban areas and with AT&C losses more than 15% and other Electricity Divisions with AT&C losses more than 25%, in the base year.

3.2.2.3 DISCOMs can cover any other areas as well as agricultural consumers, at their option, in the first phase.

3.2.2.4 Consumers in Electricity Divisions with more than 50% consumers in urban areas and with AT&C losses of 15% or less; and other Electricity Divisions with AT&C losses of 25% or less in the base year will be provided prepaid Smart Meters by March 2025.

3.2.2.5 In areas which do not have communication network, installation of prepayment meters, may be taken up.

System metering

3.2.2.6 A feeder and DT level automated online energy accounting system shall be put in place.

3.2.2.7 All feeders are to be metered with communicable & AMI/AMR meters by 31st December, 2022 so as to enable energy accounting and calculation of SAIFI and SAIDI. Existing non-communicable feeder meters shall also be replaced with communicable meters and integrated with AMI.

3.2.2.8 All feeders shall be integrated with the National Feeder Monitoring System (NFMS) proposed to be put in place shortly.

3.2.2.9 All Distribution Transformers (DTs), other than DTs feeding only agricultural consumers and HVDS transformers having capacity up to 25 kVA and other DTs less than 25 kVA capacity shall be metered with communicable and AMI/AMR meters.

3.2.2.10 Installation of DT meters in areas where consumer smart metering is being carried out in first phase (as mentioned in clause 3.2.2.2) shall be completed by December 2023.

3.2.2.11 All other DTs shall be metered by March 2025.

3.2.2.12 Existing non-communicable DT meters shall also be replaced with communicable meters and integrated with AMI.

3.2.3 **Distribution Infrastructure Works**

3.2.3.1 For Distribution Infrastructure works, one DPR for the whole DISCOM or separate DPRs for each administration unit will be submitted. DPRs shall be prepared based on need assessment as per Action Plan Part 1.

3.2.3.2 DPRs for works leading to Loss Reduction and for Modernisation shall be prepared separately as below:

- DPR for Loss Reduction **:** Armoured Cabling, HVDS, AB Cables, Feeder Bifurcation, Feeder Segregation, IT/OT related works including ERP and Billing software, etc..
- DPR for Modernisation : Works leading to System Strengthening and modernisation such as Augmentation, Renovation & Modernisation of Substations & lines, UG cabling, HVDS, new substations and lines, etc..

3.2.3.3 The DPR for Loss Reduction shall be for at least 50% of the total eligible project cost. In case the Distribution losses (T&D) are low (less than 12% in the base year), then the DISCOM may allocate more funds to DPR for Modernisation with suitable justification and details.

3.2.4 **Project Management**

3.2.4.1 One or more independent Project Management Agency(ies) (PMA) may be appointed by the DISCOM for project management.

3.3 Approval of Action Plan and DPRs

3.3.1 The Action Plan and DPRs shall be submitted to the Nodal Agency by 31st October, 2021.

3.3.2 If a DISCOM does not submit the Action Plan and DPRs by 31st October 2021, then its total eligible sanction amount for Distribution Infrastructure works may be restricted suitably keeping in view the already sanctioned DPRs of other States.

3.3.3 The Action Plan and DPRs for loss reduction and metering shall be scrutinized by the Nodal Agency and approved by the Monitoring Committee with such modifications, as are necessary to achieve the objectives of the Scheme.

3.3.4 For avoidance of doubt, it is clarified that pre-qualification conditions and Evaluation Matrix will not be applicable for approval of the Action Plan or sanction of DPRs for Loss reduction and metering. However, the release of funds for sanctioned loss reduction works from FY 2022-23 onwards shall be conditional to meeting the pre-qualification conditions and obtaining laid down minimum marks in Evaluation Matrix.

3.3.5 DPR for Modernisation shall be sanctioned, subject to DISCOM becoming eligible in the evaluation for FY 2021-22 to be carried out in FY 2022-23.

3.3.6 PMA charges, restricted to 2.5% of the GBS of component I - metering and 1.5% of project cost of component II - Distribution infrastructure works, shall be sanctioned as a separate component of the scheme by the Monitoring Committee. PMA charges, over and above the permitted amount shall be borne by the respective DISCOM / State government. Also, services of PMA shall be retained up to physical completion of the project, without any financial implications beyond that already provided.

Chapter 4. Project Implementation

4.1 Eligible Cost for determining grant

The project cost approved by the Monitoring Committee or actual cost incurred for all the three components of the scheme, whichever is less, shall be the eligible cost for determining the grant under the scheme. Any cost overrun after approval of the project (by Monitoring Committee) due to any reason whatsoever shall not be eligible for any grant and shall be borne by the DISCOM/respective State Government. The eligible project cost shall include Central taxes and all fees like forest clearance, highway and railway crossing fee etc. The project cost shall however not include the cost of land. Further, the project cost shall be reduced to the extent of any Liquidated Damages actually levied, but the encashment of performance security or bid security (EMD) shall not reduce the project cost.

4.2 Scheme Implementation Agreement

A Scheme Implementation Agreement will be signed between the State Government, DISCOM and Central Government (or Nodal agency on behalf of Central Government) for undertaking and agreeing to their stipulated roles and responsibilities as per provisions of the scheme guidelines. Amongst other clauses, the agreement will also include a clause that the performance of the DISCOMs in the Reforms Based Results Linked Revamped Distribution scheme would also form integral part of the financing norms of PFC, REC, Banks/FI's and MDBs for any project in the Distribution Sector even beyond those related to funding under this scheme.

4.3 Tripartite Agreement

In case loan component of the project cost is funded by the NBFCs under MoP, then in order to secure the loan, the existing TPA (Tri-partite Agreement) arrangement among Government of India, the State Government and the RBI shall be suitably amended to provide that the loan servicing payments in case of default can be recovered through RBI.

4.4 Mode of Implementation

4.4.1 **Metering:** These projects shall be implemented in TOTEX mode (Total expenditure includes both capital and operational expenditure) with the following options:

(i) Installation and commissioning of meters and cost recoveries in equated monthly instalments by PPP or implementation partner (or service provider) with no upfront payment by DISCOM

(ii) Some initial payment shall be made to the service provider upon installation and commissioning of the meters, with the rest of the payments made on equated monthly / quarterly instalments over the operational period.

4.4.2 **Distribution infrastructure works:** The projects shall be implemented normally on turnkey basis. However, certain works may be taken up on partial turnkey basis or departmentally with the approval of DRC and consent of Nodal Agency, subject to, overall guidance of the Monitoring Committee. The reasons for the change shall be recorded.

4.4.3 **Project Management:** For project management, one or more PMA shall be appointed. Existing PMA of DDUGJY or Saubhagya or IPDS may be used for preparation of DPR and Action Plan, and the expenses incurred will be eligible under the scheme. However, for all other works including bid process, monitoring of implementation, project completion, result evaluation and related works, a new PMA will have to be appointed as per the SBD that will be circulated by the Nodal agency.

4.5 Standard Bidding Document

4.5.1 The NSGM/REC shall issue Standard Bidding Document (SBD) for selection of AMI service provider to bring uniformity of approach for implementation of smart metering solution across the country, which shall be followed by the DISCOMs. For Distribution infrastructure works and PMA, one of the nodal agencies shall circulate Standard Bidding Documents (SBD).

4.5.2 The DISCOMs may make minor changes in the SBD, while retaining its basic structure and essence, provided that the approval of the Nodal Agency is taken for the changes, subject to, overall guidance the Monitoring Committee.

4.5.3 Projects taken up by DISCOMs through MOU route with CPSUs or their JVs and Subsidiaries shall also be permitted subject to their being implemented in TOTEX mode as per the scope of work and methodology given in the SBD.

4.5.4 For metering, Standardization Testing and Quality Certification (STQC) & Cyber security aspects have to be mandatorily included in the contract, while following Government of India's stipulations related to source of procurement.

4.6 Make in India

4.6.1 Keeping in view the aims and objectives of Atma Nirbhar Bharat Abhiyan, Ministry of Power has issued Public Procurement (Preference to Make in India) for Purchase Preference (linked with local content) Order in respect of Power Sector on 28.7.2020. This order is in line with the DPIIT Notification No.P-45021/2/2017-PP(BE-II) dated 4th June,2020. This order along-with amendments, if any, from time to time, shall be followed by the DISCOMs in the implementation of the scheme.

4.6.2 However, in case a DISCOM is availing funds through multi-lateral financial institutions, applicable DEA directives may be followed.

4.7 Implementation Period

4.7.1 The base year for fixing of targets will be the latest year for which the audited annual accounts are available at the time of the submission of the action plan FY i.e. 2019-20 or FY 2020-21. Accordingly, DISCOMs are expected to approach Ministry of Power / Nodal agency with their Action Plan based on the audited Annual Accounts and DPRs, with targeted outcomes for FY 2021-22, FY 2022-23, 2023-24 and 2024-25. There shall be no sanctions after 31.03.2023.

4.7.2 The sunset date for the scheme will be 31.03.2026, the works executed beyond which will not be eligible for release of Central Government grant.

4.7.3 As the sunset date of the scheme is already defined and disbursement of grant is based on progress and corresponding achievement of targets, it is in the interest of the DISCOMs to complete the projects expeditiously to avail the benefits under the Scheme.

4.8 MIS

4.8.1 A web portal shall be developed by the Nodal Agencies for submission of Action Plan & DPRs, capturing baseline data, physical & financial progress, quality reports, outcomes and achievements for evaluation under Result Evaluation Framework, closure, etc. The portal will enable seamless flow of data and ensure availability of information to all concerned. The web portal shall be DGQI 5.0 compliant.

4.8.2 MIS Reports on the basis of the same shall be made available to all for monitoring and evaluation.

4.9 Completion of the project

4.9.1 Nodal agency shall approve the project closure. A Project completion certificate, recommended and forwarded by State Energy Department shall be submitted after completion of scheme, which shall consist of:

(i) Details of major assets created along with actual cost incurred for the project;

(ii) Utilization certificate for grant disbursed;

(iii) Certificate of receipts and expenditure of the project certified by a Chartered Accountant;

(iv) Confirmation of remittance of unutilized grant to the GoI account;

(v) Confirmation that Interest earned on grant disbursed has been remitted to GoI account.

4.10 Results Evaluation Framework

4.10.1 As part of the action plan of the State, a Results Evaluation Framework would be formulated incorporating result parameters and trajectories. The Results Evaluation Framework would have two components (i) pre-qualifying criteria; and (ii) Evaluation Matrix.

4.10.2 The sanction of DPR for Modernisation and release of grant for both loss reduction works (other than the advance for DPR for Loss Reduction) and for the modernisation works will be based on the DISCOM meeting the pre-qualifying criteria and achieving the specified marks in the Evaluation Matrix.

4.10.3 It is clarified that pre-qualification conditions and Evaluation Matrix will not be considered for approval of the Action Plan or sanction of DPR for Loss Reduction in first year i.e. FY 2021-22 and the DPR for metering.

4.11 Pre-Qualification Criteria

4.11.1 The following pre-qualifying criteria must be mandatorily met by the DISCOM before it is evaluated on the basis of the Evaluation Matrix:

(i) DISCOMs would publish quarterly un-audited accounts within 60 days of the end of each quarter during first two years of operation of the scheme (i.e. for FY 2021-22 and FY 2022-23) and thereafter audited quarterly accounts within 45 days from 3rd year onwards.

[FY 2021-22 and FY 2022-23: Un-audited accounts for 1st Quarter ending June to be published by 31st August, for 2nd Quarter ending September by 30th November and so on.

FY 2023-24 and FY 2024-25: Un-audited accounts for 1st Quarter ending June to be published by 15th August, for 2nd Quarter ending September by 15th November and so on.

First evaluation would take place in FY 2022-23 for the performance in FY 2021-22. Accordingly, the un-audited quarterly accounts for FY 2021-22 for all four quarters should have been published as per above mentioned timelines. Further, un-audited accounts for quarter ending June and September of FY 2022-23 should also have been published as per above mentioned timelines.]

(ii) Further, DISCOMs would publish audited annual accounts by end of December of the following year during first two years of operation of the scheme (i.e. for FY 2021-22 and FY 2022-23) and thereafter audited annual accounts by end of September of the following year from 3rd year onwards.

[FY 2021-22 and FY 2022-23: Audited annual accounts to be published by 31st December 2022 and 31st December 2023 respectively.

FY 2023-24 and FY 2024-25: Audited annual accounts to be published by 30th September 2024 and 30th September, 2025 respectively.

First evaluation would take place in FY 2022-23 for the performance in FY 2021-22. Accordingly, it would be ensured that the audited annual accounts for FY 2021-22 are published by December 2022.]

(iii) DISCOMs will have ensured that no new Regulatory Assets have been created in latest tariff determination cycle.

[First evaluation would take place in FY 2022-23 and accordingly while evaluating results in this year, tariff order effective from 1st April 2022 will be considered and compared with previous tariff order for creation of any new regulatory assets. Similarly, while evaluating results in FY 2023-24, tariff order effective from 1st April 2023 will be considered and compared with 2022 order.]

(iv) State Government to ensure 100% payment of subsidy for the previous year and advance payment of subsidy up to current period in line with section 65 of EA2003 and wipe out the remaining subsidy amount by the end of the project period.

[First evaluation would take place in FY 2022-23 and accordingly while evaluating results in this year, 100% payment of subsidy for FY 2021-22 will have to be ensured along with advance payment of subsidy for FY 2022-23 up to date of submission of results to the nodal agency.

Further, it would also be ensured (by way of trajectory which would form part of REF, that the remaining subsidy of the previous years, if any, would be wiped out by the end of project period i.e. 2025-26.]

(v) All Government Departments/ Attached Offices/ Local Bodies/ Autonomous Bodies/ Boards/Corporations have made 100% payment of current electricity dues for the year under evaluation.

[First evaluation would take place in FY 2022-23 for the performance in FY 2021-22 and accordingly while evaluating results of FY 2021-22, 100% payment of current electricity dues for the FY 2021-22 will have to be ensured]

(vi) Progress commensurate to commitment in putting Govt. Offices on prepaid meters.

[Targets for putting Govt. Offices on prepaid meters would be fixed in Result Evaluation Matrix and accordingly the achievement of putting prepaid meters at Govt. offices would be seen w.r.t. agreed targets. The achievement w.r.t. targets should not be less than 100% to qualify for this condition.]

(vii) No. of days Payables to Creditors including Gencos for the year under evaluation is equal to or less than the projected trajectory as per results evaluation framework.

[Year-wise trajectory would be fixed in Result Evaluation Matrix. First evaluation would take place in FY 2022-23 for the performance in FY 2021-22 and accordingly while evaluating results of FY 2021-22, achievement w.r.t. agreed trajectory for FY 2021-22 would be considered. The achievement should be equal to or less than the agreed trajectory for FY 2021-22 to qualify for this condition.]

(viii) Tariff order for the current year in which evaluation is being done and true up of penultimate year has been issued and implemented w.e.f. 1st April of current FY.

[First evaluation would take place in FY 2022-23 and accordingly while evaluating results in this year, tariff order should have been implemented with effect from 1st April 2022 and true up should have been done for FY 2020-21.]

4.12 Evaluation Matrix

4.12.1 DISCOMs meeting the prequalification criteria shall be assessed on an Evaluation Matrix, agreed as part of Action Plan, comprising of four basic categories as below:

Sr. No.	Category	Weightage
1.	Financial Sustainability	60
2.	Operational	20
3.	Infrastructure Works	10
4.	Policy & Structural Reforms, Capacity Building and IT/OT Enablement	10
	Total	**100**

4.12.2 Recognizing that the year-wise emphasis on desired outcomes could be different, the maximum marks to individual result parameters may vary for every year of evaluation. The Evaluation Matrix will be different for each DISCOM and will be fixed for each year based on the cumulative as well as annual performance subject to the condition that the weightage of the parameters related to financial sustainability shall remain at least 60%.

4.12.3 While the weightage of parameters related to Financial Sustainability shall remain at least 60%, variations specific to the needs of the States/DISCOMs for other categories may be made with the approval of the Monitoring Committee.

4.12.4 Within each of the above four categories, individual parameters will be decided as per the requirements of the DISCOM. Maximum marks and agreed targets may be assigned to each parameter in the matrix, based on agreed priority/ significance towards achieving the objectives of the scheme.

4.12.5 Evaluation of parameters relating to financial accounts shall be based on audited quarterly/annual accounts.

4.12.6 For qualifying in the Evaluation Matrix, a DISCOM needs to score a minimum of 60 marks.

4.12.7 An illustrative Evaluation Matrix is given below. Evaluation Matrix may be modified, if required, to include a smaller number of parameters and to exclude those included in the pre-qualifying criteria to avoid duplication or considering the specific requirement of the DISCOM and/or to make the Evaluation Matrix simple.

S No	Result Parameters	Weightage	Unit of Measurement	Base Year	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
A.	**Financial Sustainability**	**60**						
1	ACS-ARR gap		Rs./kWh		25			
2	AT&C Loss - Increase in Billing and Collection Efficiency - Reduction in theft / line losses		%		25			
3	Outstanding/ Overdue Subsidy Payment by State Government		Rs. Crore		15			
4	Outstanding/ Overdue Government Dues		No. of Days Receivable		10			
5	Progress in putting Govt. Offices on prepaid meters		%		10			
6	No. of Creditor Days (including payment to Gencos for supply of power)		No. of days payable		5			
7	No. of Debtor Days		No. of days receiva		5			

S No	Result Parameters	Weigh tage	Unit of Measu rement	Base Year	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Valu es)	Max. Marks	Tar get	Achieve ment	Scor e
			bles					
8	Unliquidated Regulatory Assets		Rs. Crore		5			
	Sub Total (A)				Σ Max. Marks			Σ Score
	Weighted Score (A) = (Weightage x ΣScore)/ ΣMaximum Marks							
B	**Operational- Outcomes of Infrastructure works**	**20**						
1	Hours of supply (Rural)		Avg. Hours/ Day		20			
2	Hours of supply (Urban)		Avg. Hours/ Day		20			
3	Accurate Energy Accounts		%		20			
4	Reliability of power supply - SAIFI (System Average Interruption Frequency Index)		Nos. / year		20			
5	Data availability in the National Feeder Monitoring System / NPP		%		20			
	Sub Total (B)				Σ Max. Marks			Σ Score
	Weighted Score (B) = (Weightage x ΣScore)/ ΣMaximum Marks							
C.	**Infrastructure Works**	**10**						
1	**Metering**							
I	Consumer Metering		Nos.		**10**			
ii	DT Metering		Nos.		**20**			
iii	Feeder Metering		Nos.		**20**			
2	**Feeder Separation - % of total Agriculture feeders separated (Feeders with Agricultural load of >= 30% of total load of feeder)**		**%**		**10**			
3	Replacement of existing LT overhead bare conductor lines with AB/UG cable		Ckm		10			
4	% of Consumers with Prepaid Smart Meters (other than Govt. Deptt.)		%		15			
5	Availability of Feeders in NFMS		%		15			
	Sub Total (C)				Σ Max. Marks			Σ Score
	Weighted Score (C) = (Weightage x ΣScore)/ ΣMaximum Marks							

S No	Result Parameters	Weightage	Unit of Measurement	Base Year	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
D	**Policy & Structural Reforms, Capacity building and IT/OT enablement**	**10**						
1	SCADA		No. of Towns		15			
2	ERP Implementation		Yes/No		10			
3	Training of DISCOM Officials		Man-days		5			
4	Corporate Governance (Recommendations complied)		%		10			
5	Tariff Reforms (MYT / ToD / Cross Subsidy)				15			
6	Subsidy Delivery Mechanism/ DBT				15			
7	Consumer rights and grievance redressal				15			
8	Adoption of PPP mode				15			
	Sub Total (D)				Σ Max. Marks			Σ Score
	Weighted Score (D) = (Weightage x ΣScore)/ Σ Maximum Marks							
	Sum of Weighted Score (A+B+C+D)							

Note: In order to qualify for receipt of grant under the scheme, the total weighted score should be 60 or more.

4.12.8 The milestones against the parameters may be assigned based on the works planned as per the action plan. If the agreed milestone of respective parameters is met or exceeded, full marks corresponding to that parameter shall be given. If however, there is an underachievement with respect to any parameter, then the marks shall be proportionately reduced. If the parameter remains the same or deteriorates then no mark shall be given.

Chapter 5. Scheme Outlay, Funding pattern & Grant release

5.1 Scheme Outlay and Funding Pattern

5.1.1 The estimated outlay for the scheme is Rs 3,03,758 crore with an estimated grant from Central Government of Rs 97,631 crore. The funding pattern is as below:

S.No	Item Description	GBS % (Max)
A-1	Prepaid Smart metering solution including at consumer, DT, and feeder level including integration of existing infrastructure	15% / 22.5% as the case may be (limited up to Rs.900 or Rs.1350 respectively per meter for Consumer metering)#
A-2	Other costs including encumbrance free standardized billing modules for all states, data management, data analytics, and support to implementation etc.	100%
A-3 to A-6	Distribution Infrastructure works including SCADA, DMS, AB cables, feeder segregation etc.	60% or 90% as the case may be
B1-B4	Part-B	100%

A provision for additional incentive over and above this has been made, for Prepaid Smart Meters installed within targeted timelines of first phase mission i.e. December 2023 (as detailed in Para 5.1.3).

5.1.2 For the purpose of the grant under the Scheme, the states have been divided into two groups:

(i) All North Eastern States including Sikkim and States/Union Territories of Jammu & Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, Andaman & Nicobar Islands, and Lakshadweep are categorized as Special Category States and will be eligible for grant of 90% the approved cost of Distribution infrastructure works and approved cost of PMA and 22.5% of the approved cost of metering including the operational cost, provided that it is not more than Rs. 1350 per meter for consumer metering only.

(ii) All other States will be eligible for grant of 60% of the approved cost of Distribution infrastructure works and approved cost of PMA and 15% of the approved cost of the metering works including the operational cost, provided that it is not more than Rs. 900 per meter for consumer metering only.

5.1.3 States/UTs would be incentivised for deployment of prepaid Smart meters by December, 2023. An incentive @ 7.5% of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter, whichever is lower, would be provided for “Other than Special Category States” for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023. The incentive for Special Category States would be @ 11.25% of the cost per consumer meter worked out for the whole project or Rs. 675 per consumer meter, whichever is lower. The funds for prepaid Smart Metering will be made available to the DISCOMs only after installation, commissioning and demonstration of at least one prepaid recharge in the area specified by the DISCOM in the DPR approved by the Monitoring Committee.

5.1.4 The operation and maintenance cost of the meter over the life of the meter as per the SBD shall be included in the cost of metering works for computation of grant.

5.1.5 For consumer metering, feeder and DT metering to be carried out in TOTEX mode, it is expected that the DISCOM will be able to finance balance cost other than grant, due to enhanced revenue as a result of improvement in billing and collection due to prepaid metering. This component is self-financing. State Government/DISCOM may also provide Budgetary support in TOTEX mode. Since the implementation of the metering scheme is proposed through PPP on TOTEX mode, the DISCOM will not have to pay upfront for all the capital expenditure.

Loan

5.1.6 For works other than metering works under Part A, counterpart funding will be provided by the DISCOM/ State Government. DISCOM can raise funds from REC, PFC, Banks & other FIs. Further, counterpart funding from bilateral/multilateral funding agencies can also be leveraged for which the Government of India would extend benefits of reduced Government Guarantee fee. The loan may be drawn at any stage of the project, whenever grant funds are not available to meet the obligations of the project. After grant is disbursed, the DISCOM may prepay the loan component to the extent of the grant disbursed, for which no prepayment shall be levied by REC and PFC, in case loan is taken from them.

5.2 Release of grant for Metering and Distribution Infrastructure Works

5.2.1 Metering

5.2.1.1 Grant for metering works, will be due when a meter is successfully installed and commissioned, and essential services and data related to it are provided for a period of one month to the DISCOM. It will be essential that a consumer meter is recharged at least once, for the release of grant pertaining to it to become due. The Nodal Agencies may decide as to what constitute essential services and data for system meters.

5.2.1.2 The DISCOM may submit claim for release of grant in a phased manner when grant becomes due against 5% of the total meters planned to be installed, or such number of meters or such period that the Nodal Agencies deem practical and convenient. After the first release, subsequent releases shall be subject to submission of utilization certificate of the previous releases.

5.2.1.3 It is clarified that grant shall not been given in advance for this component. Further it is also clarified that pre-qualification conditions and results evaluation matrix will not be applicable for release of grant for metering works.

5.2.2 Distribution Infrastructure Works

5.2.2.1 **Phase I:** After approval of the DPR for Loss Reduction, DISCOM will become eligible for release of 10% of the grant for Loss Reduction part of the project as advance - 5% on sanction and further 5% on award of works.

5.2.2.2 **Phase II:** The DISCOM shall be evaluated in FY 2022-23 as per the Results Evaluation Framework of the Action Plan for FY 2021-22 and if it qualifies, then,

- It will become eligible for total release of 30% (including the advance 10%) of the grant component of the project cost of Loss Reduction part and
- It will become eligible for release of 30% of the grant component of the project cost of DPR for Modernization – 10 % on sanction and 20% on award of works.

5.2.2.3 **Phase III:** The DISCOM shall be evaluated in FY 2023-24 as per the Results Evaluation Framework of the Action Plan for the FY 2022-23, and if it qualifies, then it will become eligible for cumulative release of 60% (including the earlier release) of grant component of the project cost of DPRs.

5.2.2.4 **Phase IV:** The DISCOM shall be evaluated in FY 2024-25 as per the Results Evaluation Framework of the Action Plan for the FY 2023-24 and if it qualifies, then it will become eligible for cumulative release of 100% of the grant component of the project cost of DPRs. Out of the eligible 40%, 35% will be released on meeting the conditions prescribed in 5.3. and balance 5% will be released on submission of project completion report as per clause 4.8.1.

5.2.3 It is clarified that if a DISCOM achieves the targets as per Action Plan of any previous FY in a subsequent year, then it shall be eligible for release of grant pertaining to that FY. For example, DISCOM will be evaluated in FY 2022-23 as per the Results Evaluation Framework of the Action Plan for the FY 2021-22 and if DISCOM does not achieve the targets of FY 2021-22 then it will not be eligible for release pertaining to FY 2021-22. Subsequently, DISCOM will be evaluated in FY 2023-24 as per the Results Evaluation Framework of the Action Plan for the FY 2021-22 and FY 2022-23 and if it achieves the targets specified for FY 2021-22 then it becomes eligible for release pertaining to FY 2021-22 and if it has also achieved the targets for FY 2022-23 then it will be eligible for cumulative release/sanction pertaining to FY 2021-22 and FY 2022-23.

5.2.4 If by the end of year 2025-26, a DISCOM is not eligible for release of any grant, the initial advance of 10% of the grant component of the cost of DPR for Loss Reduction will have to be refunded by the DISCOM.

5.3 General Conditions for Release of Grant for Distribution Infrastructure Works

5.3.1 The grant (other than advance for project for Loss Reduction) shall be released to DISCOMs, which have been found eligible as above, subject to the following conditions:

(i) Submission of a certificate regarding utilization of grant already released;

(ii) Submission of a certificate regarding receipts and expenditure on the project certified by a Chartered Accountant;

(iii) Submission of physical and financial (grant and counterpart funding) progress report;

(iv) Sanction letter for counter-part funding / DISCOM's own resources / State Government funding for Distribution Infrastructure Works.

5.3.2 It is clarified that for release of advance pertaining to DPR of Loss Reduction and the first instalment of DPR for Modernisation, signing of the tripartite/bipartite agreement will be a necessary precondition.

5.4 Release of grant for PMA

5.4.1 Grant for PMA component shall be released, subject to the following conditions:

(i) Grant shall be released on the basis of the sanctioned cost or award cost, whichever is lower;

(ii) Grant will be released in the month of March, every year;

(iii) 10% shall be released as advance in the year of sanction;

(iv) 30% shall be released each year subsequent to the sanction year;

(v) Subsequent releases shall be subject to submission of utilization certificate of the previous releases and achievement against deliverables as specified in the SBD referred to in Clause 4.3.3 .

5.5 Fund Management by Nodal Agencies

5.5.1 Nodal Agencies shall adopt Corporate Internet Banking (CINB) and all payments shall be made directly to the DISCOM's dedicated bank account.

5.6 Fund Management by DISCOM

5.6.1 DISCOM shall also adopt CINB. All project related payments to the contractors (and others) by DISCOM shall be done directly from the dedicated bank account through e-banking only. DISCOM shall not open any other bank account(s) under the scheme. Nodal Agency shall have the right to view the DISCOM account. The nature of the account shall be savings bank account without CLTD (Corporate Liquid Term Deposit) facility or as per GoI's directions from time to time in this regard.

5.6.2 Any interest earned on grant shall be remitted to Ministry of Power's bank account on regular basis and at least once in a quarter.

5.6.3 Since grant under the scheme is Central Government money and DISCOMs are only the custodian of this money, income tax is not payable on interest earned on this money. DISCOMs shall take necessary steps to seek exemption from Income Tax Department regarding deduction of Tax at Source by the bank on interest accrued on un-utilized fund under the scheme. However, in case of deduction of TDS by bank, the Utilities shall claim refund of the deducted amount from Income Tax Department directly while filing annual tax return and remit it to Ministry of Power's account.

5.6.4 The DISCOM shall ensure that funds released under the scheme are utilized for the purpose for which they are meant and are not diverted for any other purpose whatsoever. In case of any breach or deviation, further release of funds shall be stopped.

5.7 Public Financial Management System (PFMS)

5.7.1.1 The scheme being a Government of India program, the release from Nodal Agencies to the DISCOMs shall be done through PFMS and the DISCOMs shall use PFMS for fund flows under the scheme.

5.7.1.2 The DISCOMs shall mandatorily enter details like receipts, expenditures, etc. in PFMS portal. In case of non-entering desired details in PFMS portal, banks may not consider release of funds to contractors.

5.7.1.3 DISCOMs receiving funds under the scheme are to be registered / mapped in PFMS. Nodal Agencies / Programme Division of Ministry of Power will ensure that all DISCOMs to whom funds are to be released are properly registered/mapped in PFMS.

5.7.1.4 Nodal Agencies /DISCOMs shall submit status of unspent grant lying with them to Ministry of Power on a quarterly basis.

5.7.1.5 DISCOMs shall maintain books of accounts both for receipt of funds from Nodal Agency and release to contractors for each of the project.

5.7.1.6 The DISCOM shall ensure that fund shall not be invested in any other bank/branch, whether for short term or medium term, including fixed deposits.

5.8 Utilization Certificate

5.8.1 DISCOM shall submit utilization certificates (UC) for the funds released during the financial year in prescribed format latest by 30th April of succeeding year.

5.9 Audit

5.9.1 The DISCOM will ensure audit of the scheme accounts relating to receipts of funds from GoI / Nodal agency and expenditure incurred by the DISCOM against such receipts during the financial year by an independent Chartered Accountant and furnish a report to the Nodal agency latest by 30th June of the succeeding year. Nodal agency shall consider release of further funds on the receipt of audited report and certificate from Charter Accountant.

5.9.2 In addition to the above, the works and finances would be open to audit by the office of the Comptroller & Auditor General of India (C&AG) as well as Internal Audit Wing, Office of Controller of Accounts, MoP.

Chapter 6. Monitoring & Evaluation

6.1 Third Party Evaluation under Result Evaluation Framework

6.1.1 Appropriate third party/parties will be appointed by MOP / Nodal Agencies to assess / verify the achievements of DISCOMs with respect to the action plan finalized on periodical basis using the Result Evaluation Framework.

6.1.2 NITI Aayog will be involved in the process of selection of independent third parties to be appointed by MOP/Nodal Agencies for assessment and verification of results with respect to the agreed Action Plan and Result Evaluation Framework. Separate guidelines will be issued in this regard.

6.2 Performance Evaluation of the scheme

6.2.1 This will be carried out by a separate third-party agency(ies) by the Nodal Agencies. This will consist of following parts:

(i) **A Mid-term evaluation** of the scheme will be taken up by Ministry of Power on the basis of progress made by the scheme beneficiaries viz the DISCOMs, as demonstrated by results obtained for FY 2021-22 & FY 2022-23.

(ii) **A Post completion evaluation** of the scheme will be done.

6.2.2 Guidelines for Mid-Term and Post completion evaluation shall be issued separately.

6.3 The expenses for evaluations mentioned above (except annual evaluations under Results Evaluation Framework) shall be met from Part B component (enabling charges of MoP) of the scheme. The cost towards evaluation under Result Evaluation Framework shall be borne by the nodal agencies out of their eligible fee.

6.4 This scheme would also be reviewed by the District Development Coordination and Monitoring Committee (DDCMC), also known as DISHA.

6.5 Quality Assurance

6.5.1 The DISCOM shall be responsible & accountable for assuring quality in the scheme works. Accordingly, DISCOM shall formulate a comprehensive Quality Assurance (QA) and Inspection Plan with an objective to build quality infrastructure under the project. The QA and Inspection Plan shall be an integral Part of the contract agreement with turnkey contractor or equipment supplier/vendor and erection agency as the case may be in case of partial turnkey and departmental execution of works. Documentation with regard to Quality Assurance & Inspection Plan shall be maintained by DISCOM and kept in proper order for scrutiny during the course of project execution and for future reference. The DISCOM has to ensure that the quality of material/equipment supplied at site and field execution of works under the project is in accordance with Quality Assurance & Inspection Plan. DISCOM may use the MQP (Manufacturing Quality Plan) and FQP (Field Quality Plan) used in DDUGJY and IPDS schemes by suitably modifying as per requirement of this scheme.

Chapter 7. Stakeholders - Roles and Responsibilities

7.1 Monitoring Committee: The Office memorandum issued in this regard is enclosed as **Appendix-II**. The Committee will be empowered to:

(i) Approve operational guidelines including scope of work and to take necessary decisions for operationalization of various components of scheme and amendments thereof within the framework approved by CCEA;

(ii) Approve Action Plans including the results evaluation framework and sanction DPRs/Projects;

(iii) Monitor and review the implementation of the scheme;

(iv) Exercise powers vested with the Monitoring Committee constituted in terms of OM No. 20/9/2019-IPDS dated 20.7.2021 in respect of issues pertaining to the implementation of the scheme.

7.2 Nodal Agencies

7.2.1 REC and PFC have been designated as Nodal Agencies for the scheme. The states have been allocated between both organisations as stated in **Appendix-III**. However, they may, with mutual consent, change the states/works, based on their strength and competence in a state/work.

7.2.2 All works relating to these states right from sanction to closure shall be the responsibility of the concerned organisations under the overall guidance of the Monitoring Committee. The role of the Nodal Agencies includes the following:

(i) Notify all the guidelines and formats required for implementation of the project from time to time;

(ii) Appraise the Action Plan and DPRs before putting up to the Monitoring Committee;

(iii) Conduct all works relating to holding of the Monitoring Committee meetings for approvals;

(iv) Evaluation as per Results Framework and determine the eligible releases to be made every year;

(v) Administer the Grant Component;

(vi) Develop a dedicated web portal for submission of DPRs and for maintaining the MIS of the projects;

(vii) Monitor physical and financial progress of the projects.

(viii) PMU/ consultancy assistance for the Ministry

The expenditure on the aforementioned works (as applicable) shall be met out of the Nodal Agency fee.

7.3 State Government shall have the following responsibilities:

(i) To approve at the level of the State Cabinet the action plan under the Scheme;

(ii) To make upfront payment of revenue subsidy to the DISCOM;

(iii) To ensure dues of Govt departments and agencies, to the DISCOMs are paid on time;

(iv) To facilitate/enable approval of tariff for the DISCOM in time every year as per regulations and finance regulatory assets and financial losses;

(v) To provide support on policy issues on Distribution of power in the state;

(vi) To provide required land for sub stations and facilitate in obtaining other statutory clearances (ROW, forest etc.);

(vii) To arrange for DISCOM contribution in case DISCOM fails to arrange the same;

(viii) To furnish guarantee for the loan component under the scheme in case the DISCOM is not able to provide any other mode of security.

7.4 Distribution Reforms Committee (DRC)

7.4.1 A DRC shall be constituted which shall be chaired by the Chief Secretary, Secretary in charge of the Energy/Power Department of the State as the convener. The Committee shall comprise of Secretary (Finance), Secretary (Land Revenue) and Secretary (Forest and Environment) as its members.

7.4.2 The DRC shall review the progress of the scheme at the State level. Without prejudice to the generality of the above, it shall:

(i) Recommend the Action Plan for approval of State Cabinet;

(ii) Recommend the DPRs for approval of Monitoring Committee;

(iii) Approve change in the mode of execution with the consent of the Nodal agency;

(iv) Monitor the implementation of the Action Plan;

(v) Monitor physical and financial progress including quality of the projects.

7.5 DISCOMs shall be responsible for implementing the scheme as per the Guidelines, under the overall guidance of the DRC, Nodal Agencies and the Monitoring Committee. Without prejudice to the generality of the above, it shall have the following functions:

(i) Preparation of action plans and DPRs and online submission of the same to the Nodal Agency;

(ii) Implementation of the scheme within the scheduled completion period as per guidelines;

(iii) Appointment of Project Management Agency (PMA);

(iv) Establishment of a dedicated project implementation cell at district level and a centralized cell at Head office level;

(v) Submission of updated monthly physical and financial progress of the project to the Nodal Agency including its update on the web portal;

(vi) Ensuring that there is no duplication / overlapping of works with any other Government of India and State scheme;

(vii) Providing information to the Nodal Agency, as and when required.

Chapter 8. Part B of the scheme and other components fully funded by grant

8.1 Part B focusses on the softer part – up-gradation of human skills; process improvements; Nodal Agency fee and enabling provisions; awards; incentives, evaluation, PMA charges other than that covered in Part-A, scheme governance; and support for reforms through consultancy. This will include capacity building in frontier technologies such as smart grids and also on institutional capacity building.

8.1.1 **Training**

Training in good corporate governance practices, technical matters, advance technology intervention areas, new business processes, etc. for the personnel involved in execution of scheme at the field level are envisaged under this head. The details of the training programs will be finalized by the Nodal agency with the approval of the Monitoring Committee. The cost of these activities will be borne out of the MoP component of enabling charges.

8.1.2 **Awards and Incentives**

Ministry of Power will institute various awards and incentives for DISCOM personnel and management for showing exemplary performance in areas both within and beyond the realm of the scheme. The awards and incentives will be instituted from time to time by the Nodal agency with the approval of Monitoring Committee. The cost of these activities will be borne out of the MoP component of enabling charges.

8.1.3 **Communication Plan & Consumer Engagement**

The nodal agencies shall prepare a multi-modal communication plan in consultation with MoP for the scheme. Consumer engagement and consumer awareness on prepaid smart metering shall be designed and campaigning will be carried out in consultation with Nodal Agency . The cost of these activities will be borne out of the MoP component of enabling charges.

8.1.4 **Nodal Agency Fee**

Nodal agency shall be eligible for 0.5% of the sum total of the GBS component of the various projects of different eligible entities approved by Monitoring Committee as its fee for the works mentioned in para 7.2.2.

8.1.4.1 **Release of Nodal Agency Fee**

25% of the eligible Nodal Agency fee for the projects sanctioned in a year shall be released in the month of March of that year and the remaining in the month of March of subsequent years in three equal instalments

8.2 **Unified Software**

There is a provision in the smart metering component of Part- A of the scheme for development of software for the Digital Systems with approval of Monitoring Committee which can be utilised by willing DISCOMs at their option so that each DISCOM does not have to spend money separately on the software. The software will be developed keeping in view issues such as interoperability, data security, and consumer privacy. This will be funded 100% as grant under Part A of the scheme.

8.3 Advanced ICT including AI and ML based solutions

Artificial Intelligence would be leveraged to analyse data generated through IT/OT devices including System Meters, prepaid Smart meters to prepare actionable MIS from system generated energy accounting reports every month so as to enable the DISCOMs take informed decisions on loss reduction, demand forecasting, asset management, Time of Day (ToD) tariff, Renewable Energy (RE) Integration, network management, consumer analytics and for other predictive analysis. This would contribute a great deal towards enhancing operational efficiency and financial sustainability of the DISCOMs.

A framework will be developed for promoting use of AI/Blockchain/Big Data/ML and such other new technology in power Distribution which shall be approved by the Monitoring Committee. On the basis of this framework, financial support will be provided to start ups, incubators and DISCOMs to promote such new technology. This will be funded 100% as grant under Part A of the scheme.

8.4 National Feeder Monitoring System (NFMS)

All feeders shall be integrated with the National Feeder Monitoring System (NFMS) which will be put in place. Full funding support will be provided for this purpose from Part-A of the scheme.

F. No. 20/9/2019-IPDS Appendix-I
Government of India
Ministry of Power
Shram Shakti Bhavan, Rafi Marg, New Delhi-110001

Dated, 20th July, 2021

To

1. Chief Secretary of all States and UTs
2. Additional Chief Secretary Principal Secretary/Secretary (Energy/Power) of all States and UTs
3. CMDs/MDs of State Power Distribution Utilities
4. CMD, REC Ltd.
5. CMD, Power Finance Corporation Ltd.

Subject: Revamped Distribution Sector Scheme: A Reforms-Based and Results-Linked Scheme.

Sir,

I am directed to forward herewith Office Memorandum of the Revamped Distribution Sector Scheme - A Reforms-Based and Results-Linked Scheme.

Encl: As above

Yours faithfully,

Srikanth

(M. Srikanth Reddy)
Deputy Director (UR&SI-II)
Tel:011-23319108
Email: srikanthreddy@nic.in

Copy to:

1. The CEO, NITI Aayog, Sansad Marg, New Delhi.
2. Secretary, Ministry of Finance, Department of Expenditure, North Block, New Delhi.
3. Secretary, Ministry of Home Affairs, North Block, New Delhi.
4. Secretary, Ministry of Electronics and IT, CGO Complex, New Delhi.
5. Secretary, Ministry of New & Renewable Energy, CGO Complex, New Delhi.
6. Prime Minister's Office (Shri Rohit Yadav, Joint Secretary), South Block, New Delhi.
7. Cabinet Secretariat (Shri Ashutosh Jindal, Joint Secretary), Rashtrapati Bhawan, New Delhi.
8. Cabinet Secretariat (Shri S.G.P. Verghese, Director), Rashtrapati Bhawan, New Delhi **with reference to their OM No. CCEA/11/2021(i) dated 02nd July, 2021.**
9. Chairperson, CEA, New Delhi
10. CMD, PGCIL
11. DG, Bureau of Energy Efficiency
12. Director, NPMU, NSGM

----2/-

13. Budget Section/Finance Division, Ministry of Power
14. Controller of Accounts, SevaBhavan, R.K. Puram, New Delhi.
15. Principal Director of Audit, Infrastructure, New Delhi

Copy also to, for information:

(i) PS to Hon'ble Minister of Power
(ii) PS to Hon'ble Minister of State for Power
(iii) Sr. PPS to Secretary (Power).
(iv) PPS to AS(Distribution)/PPS to AS&FA, Ministry of Power
(v) PPS to JS(Distribution/Hydro)/JS(R&R and OM)/JS(Trans./IT), Ministry of Power
(vi) PPS to Director(UR&SI)/ PS to Director(DS), Ministry of Power

F. No. 20/9/2019-IPDS
Government of India
Ministry of Power
Shram Shakti Bhawan, Rafi Marg, New Delhi-110001

Dated, 20th July, 2021

OFFICE MEMORANDUM

Subject: Revamped Distribution Sector Scheme: A Reforms based and Results linked Scheme.

Sanction of the President is conveyed for the implementation of "**Revamped Distribution Sector Scheme - A Reforms based and Results linked Scheme**" with the objective of improving the quality and reliability of power supply to consumers through a financially sustainable and operationally efficient distribution Sector. The Scheme aims to reduce the AT&C losses to pan-India levels of 12-15% and ACS-ARR gap to zero by 2024-25.

2. The Scheme has an outlay of Rs.3,03,758 crore with an estimated gross budgetary support of Rs.97,631 crore from the Government of India.

3. The ongoing approved projects under the Schemes of IPDS, DDUGJY along with PMDP-2015 for the erstwhile State of Jammu & Kashmir would be subsumed in this Scheme and the savings of the associated GBS (Gross Budgetary Support) of approx. Rs. 17000 crore would be part of the total outlay of the Revamped Distribution Sector Scheme under the existing terms and conditions till their sunset on 31" March, 2022. The funds under these Schemes would be available for the approved ongoing projects under Prime Ministers Development Program (PMDP) for the erstwhile state of J&K launched in 2015 (under IPDS and DDUGJY) and of Ayodhya, Uttar Pradesh (under IPDS) till 31 March, 2023.

4. Scope of Scheme :

4.1 The Scheme has two parts: **Part 'A'** – Financial support for upgradation of the Distribution Infrastructure and Prepaid Smart Metering & System Metering and **Part 'B'** – Training & Capacity Building and other Enabling & Supporting Activities. The details are enclosed at **Annexure – I (Page: 9-10).**

PART 'A'

4.2 To avail funding under this part, an eligible DISCOM is required to prepare an Action plan for strengthening their distribution system and improving its performance by way of various reform measures, which would result in improvement in their operational efficiency and financial viability as well as improve the quality and reliability of power supply to the consumers. DISCOMs will have the flexibility to draw up their Action plans keeping in view their own context. However, a DISCOM which is making losses will not be able to access funds under this Scheme unless it draws up a plan to reduce the losses, lists out the steps it will take to reduce such losses and the calendar thereof, get their State Government's approval to it, and file it with the Central Government. There will be a prequalification criteria in terms of compliance with best management practices; such as publication of audited accounts on time, not creating Regulatory Assets, accounting and payment of payable subsidy in accordance with Section 65 of the Electricity Act etc. The funding for the works (other than prepaid Smart Metering, Distribution Transformer Metering and Feeder Metering including integration of existing Metering infrastructure) would be contingent upon DISCOMs clearing the pre-qualifying criteria and taking steps in accordance with the loss reduction plan.

4.3 Each DISCOM will prepare an Action Plan, with subcomponents for strengthening its Distribution system , and to improve their performance . The Action Plan will have two parts. The first part will include an analysis of the reasons/root cause for losses, and list out the steps which are required and proposed for reduction of losses and ACS-ARR gap and the time taken for taking these steps. DISCOM will specify the activities and reforms proposed to improve their performance. These activities and reform measures will be finalized on basis of its operational and financial data and will be worked out to address DISCOM-specific problems. An indicative list of reforms/activities is enclosed at **Annexure – II (Page: 11).**

4.4 There shall be a Results Evaluation Framework which shall be finalized by the Monitoring Committee in respect of each DISCOM after incorporating result parameters and trajectories. It would have two components (i) Pre-qualifying criteria; and (ii) Result Evaluation Matrix. The pre-qualifying criteria need to be mandatorily met with by the DISCOMs before they can be evaluated on the basis of the Result

Evaluation Matrix. Thereafter, performance on the basis of Result Evaluation Matrix shall form the basis for release of funds under the Scheme. Details are enclosed at **Annexure-III (Page : 12-16).**

4.5 The second part of the Action plan will list out the Work plan for loss reduction and further strengthening the Distribution System as per needs assessment. States/DISCOMs will be able to access funds from this Scheme for addressing infrastructure constraints in Distribution System and for its further augmentation/strengthening. Works which are required for AT&C loss reduction will be given priority. Indicative list of works to be covered under the Scheme is enclosed at **Annexure – IV (Page : 17)**. There is a provision of Rs. 20,000 crores in the Scheme for agriculture feeders where these have not been segregated as yet. Thereafter, these feeders will be solarized under KUSUM – leading to cheap/ nominally priced day time power for agriculture irrigation as may be determined by the State Government .

4.6 Prepaid Smart Meters including System metering with communication features are important interventions in reducing Distribution losses in the Utilities and in facilitating automatic measurement of energy flows and energy accounting as well as auditing without any human intervention. This intervention will also facilitate switch over to digital pre-paid system, with recharging facility through mobile phones, and enabling of Time-of-Day tariff.

4.7 In order to attain the key objective of loss reduction in electricity distribution, the Scheme envisages providing funding through Gross Budgetary Support for the installation of prepaid Smart Meters under TOTEX (CAPEX plus OPEX) pattern and in a mission mode in the first phase in (i) all Electricity Divisions of 500 AMRUT cities, with AT&C Losses > 15% (ii) all Union Territories (iii) MSMEs and all other Industrial and Commercial consumers (iv) all Government offices at Block level and above (v) other areas with high losses. Prepaid Smart metering for remaining consumers would be taken up by the respective DISCOMs in a phased manner subsequently. Looking at the scattered nature of agriculture connections and their remoteness from the habitations; as well as their proposed solarization under Kusum; the smart meters need not be installed in Agriculture connections.

4.8 Along with installation of prepaid Smart metering and the associated Advanced Metering Infrastructure (AMI), installation of communicable System meters at Feeder and Distribution Transformer level with communication features will also be through Gross Budgetary Support under TOTEX mode to enable proper energy accounting every month for identification of theft prone pockets and high loss areas.

4.9 Advanced ICT like Artificial Intelligence, Machine Learning and Blockchain Technology would be leveraged to analyse data generated through IT/OT devices including System Meters, prepaid Smart meters to prepare actionable MIS from system generated energy accounting reports every month so as to enable the DISCOMs to take informed decisions on loss reduction, demand forecasting, asset management, Time of Day (ToD) tariff, Renewable Energy (RE) Integration and for other predictive analysis. This would contribute a great deal towards enhancing operational efficiency and financial sustainability of the DISCOMs. Gross Budgetary Support (GBS) under the Scheme would be used for development of applications related to the use of advanced ICT like Artificial Intelligence, Machine Learning and Blockchain Technology in the Distribution Sector and also for promoting development of Start-Ups in the Electricity Distribution Sector across the country.

4.10 GBS under the Scheme would also be available to MoP/Nodal Agency to develop a Software for the Digital systems which can be utilized by the DISCOMs / Power Departments of the country, so that each DISCOM does not have to spend money separately on the Software. This Software will be developed in consultation with the DISCOMs, keeping in view data security and consumer privacy. However, this Software will be optional for the DISCOMs.

PART 'B'

4.11 Part-B contains supporting and enabling components such as up-gradation of Smart Grid Knowledge Centre including AI, Training / Capacity building, awards and incentives, reform support in form of consultancy, Nodal Agency fee, MoP enabling activities (communication plan, consumer awareness and other associated measures such as third party evaluation etc), and PMA charges etc. Details are enclosed at **Annexure – V (Page : 18).**

5. DISCOMs Eligible :

All State-owned Distribution companies and State /UT Power Departments (referred to as DISCOMs collectively) excluding private Sector power companies will be eligible for financial assistance under the Revamped Scheme.

6. Funding Pattern :

6.1 For rolling out prepaid Smart metering in a mission mode under Part A – in "Other than Special Category States", a fixed amount of 15% (22.5% in case of Special Category States) of the cost per meter worked out over the whole project period, subject to a maximum of Rs. 900/- (Rs. 1350/- in case of special category States) per meter in case of consumer meters, will be funded.

6.2 States/UTs would be incentivised for deployment of prepaid Smart meters by December, 2023. An incentive @ 7.5% of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter, whichever is lower, would be provided for "Other than Special Category States" for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023. The incentive for Special Category States would be @ 11.25% of the cost per consumer meter worked out for the whole project or Rs. 675 per consumer meter, whichever is lower. The funds for prepaid Smart Metering will be made available to the DISCOMs only after installation, commissioning and demonstration of at least one prepaid billing period in the area specified by the DISCOM in the DPR approved by the Monitoring Committee.

6.3 Development of applications related to the use of advanced ICT like Artificial Intelligence, machine Learning and Blockchain Technology in the Distribution Sector and the unified billing and collection system will be funded 100% through the GBS.

6.4 For Distribution System upgradation works, maximum financial assistance given to DISCOMs of "Other than Special Category States" will be 60% of the approved cost, while for the DISCOMs in "Special Category States", the maximum financial assistance will be 90% of the approved cost.

6.5 For the purpose of execution of this Scheme, all North Eastern States including Sikkim and States of Himachal Pradesh & Uttarakhand and Union Territories of

Jammu & Kashmir, Ladakh, Andaman & Nicobar Islands, and Lakshadweep will be treated as Special Category States/UTs

6.6 Part B of the Scheme will be fully funded by grant through Central/State Governments.

7. Release of Funds :

7.1 The funds for prepaid Smart Metering will be made available to the DISCOMs only after installation, commissioning and demonstration of at least one prepaid billing period in the area specified by the DISCOM in the DPR approved by the Monitoring Committee.

7.2 All DISCOMs that initiate their prepaid Smart metering tenders after 1st January, 2020 will be eligible for funding, if they carry out prepaid Smart metering works in TOTEX mode after obtaining approval of Monitoring Committee in this regard.

7.3 The funding for the works other than prepaid Smart metering, DT Metering and Feeder Metering including integration of existing Metering infrastructure would be contingent upon DISCOMs clearing the pre-qualifying criteria and achieving at least 60% marks on the result evaluation matrix.

7.4 The first instalment will be released as 10% advance on DPR approval and yearly fund release for second and subsequent instalments will be based on annual evaluation (as per agreed Results Evaluation Framework) as under:

- 2nd Instalment - 20% of GBS after 1st evaluation (30% cumulative)
- 3rd Instalment - 30% GBS after 2nd evaluation (60% cumulative)
- 4th Instalment - 40% GBS after 3rd evaluation (100% cumulative)

8. Financing of the Scheme :

8.1 The estimated outlay for the Scheme is Rs 3,03,758 crore with an estimated GBS from Central Government of Rs 97,631 crore. The Government of India will provide Rs. 1,030 Crore for activities under Part B of the Scheme. It is envisaged that about Rs. 200 crores will be spent by the State Governments towards reforms support in the form of consultancy.

8.2 Savings under various components of this Scheme (GBS) will be fungible across all parts of the Scheme with the approval of the Monitoring Committee .

8.3 Counterpart funding will be provided to DISCOMs by PFC/REC and/or Banks/other FIs. Further, counterpart funding from bilateral/multilateral funding agencies can also be leveraged for which Government of India would extend benefits of reduced Government Guarantee fee.

9. The performance of the DISCOMs in the Reforms Based Results Linked Revamped Distribution Scheme would also form integral part of the financing norms of PFC, REC, Banks/FI's for any project in the Distribution Sector even beyond those related to funding under this Scheme.

10. Monitoring Committee:

10.1 An inter-ministerial Monitoring Committee for the Scheme will be constituted under the chairmanship of Secretary, Ministry of Power. The Monitoring Committee will frame and approve all operational guidelines, sanction all Action Plans & DPRs of DISCOMs / States and proposals/DPRs under Part B, and review and monitor implementation of Scheme including review of Third-Party Mid-Term Evaluation of the Scheme carried out by the Nodal Agency.

10.2 The Monitoring Committee will also approve scope of works and take necessary decisions for operationalization of various components of the Scheme and amendments thereof, within the framework approved by Cabinet Committee on Economic Affairs (CCEA). The Monitoring Committee will also be competent to modify the scope of works under various parts of the Scheme in line with the objectives of the Scheme.

10.3 The maximum marks and targets for individual parameters in Result Evaluation framework may differ for each year of evaluation .The result evaluation framework would be different for each DISCOM and would be fixed for each year depending on the cumulative performance as well as the annual performance. The funds for a particular year in respect of Infrastructure Works would be released in respect of a DISCOM for a particular year only after it has been found to have fulfilled the pre-qualifying criteria and its total weighted score is at least 60 marks on the result evaluation matrix after having been evaluated by the Nodal Agency and approved as such by the Monitoring Committee . Evaluation of parameters relating to financial accounts shall be based on audited quarterly / annual accounts .

11. REC Limited and Power Finance Corporation Limited (PFC) would be the Nodal Agencies for the Scheme and would be responsible for operationalization of Scheme in the entire country.

12. The State Governments and their DISCOMs will sign a Tripartite Agreement with the Central Government before availing benefits under the Scheme.

13. The duration of the Scheme is 5 years (FY 2021-22 to FY 2025-26). The sunset date for the Scheme will be 31.03.2026.

14. The Nodal Agencies will submit monthly progress report indicating both financial and physical progress on the implementation of the Scheme to Ministry of Power and CEA.

15. The detailed guidelines for the implementation of the Scheme will be issued separately.

16. The expenditure under the Scheme would be debited to the budget grant no. 78 of Ministry of Power.

17. This issues with the concurrence of Finance Branch of the Ministry of Power vide their Dy. No. 379/Fin./2021 dated 20.07.2021.

20/7/21

(Tanmay Kumar)
Joint Secretary to the Government of India
Tele-Fax No.: 23714168
E-mail: tanmay.kumar-rj@gov.in

Annexure - I

Details of Part – 'A' and Part – 'B' of Scheme

Part- 'A' of Scheme – Funding for Smart Metering

Item Head	Item Description	Quantity	GBS, % (Max)
A-1	Prepaid Smart metering solution including at consumer, DT, and feeder level including integration of existing infrastructure	25 crore	15% / 22.5% (limited upto Rs.900 or Rs.1350 respectively per meter for Consumer metering)###
A-2	Other costs including encumbrance free standardized billing modules for all States, data management, data analytics, and support to implementation, AI etc.	Lumpsum	100%

Part- 'A' of Scheme – Funding for Infrastructure Creation

Item Head	Item Description	Quantity Estimated
A-3	Segregation of agriculture feeders	10,000 Nos.
A-4	Replacement of existing LT Overhead bare conductor lines with AB Cable / HVDS in theft prone areas	4,00,000 Kms
A-5	Distribution Automation in Urban Areas	
A-5.1	SCADA/DMS in Big cities, having population >2.75 lakh, including opex for 2 years	100 Nos.
A-5.2	SCADA (Real Time Supervision & Controllability of Sub-station) including opex for 2 years	3875 Nos.
A-6	Funding for distribution infrastructure including HVDS, IT and OT in Distribution Sector, Feeders, conductors, Transformers, cables, substations, feeders, capacitors etc. to cater to load growth and increasing demand	As required

Part- 'B' of Scheme

Item Head	Item Description	Quantity	Outlay (Rs. Crore)	GBS % (Max)	GBS(Rs. Crore)
B-1	Augmentation of Smart Grid Knowledge center including AI	-	30	100%	30
B-2	Training / Capacity building/ Awards and incentives	-	200	100%	200
B-3	Reforms support in form of consultancy		200	100%	-200*
B-4	Nodal agency fee, MoP enabling activities and PMA charges**	-	1,000	100%	1000
Sub-Total (Part-B):			**1,430**		**1,030**

**Amount for reform support in form of consultancy may be taken State Governments and utilized for the Scheme.*

***Approximately 1% of the estimated GBS for Part A for smart metering and Infra creation.*

For Part A – Prepaid Smart metering in "Other than Special Category States", a fixed amount of Rs 900 per consumer meter or 15% of the cost per consumer meter worked out for the whole project, whichever is lower, would be funded. In case of "Special Category States", a fixed amount of Rs 1350 per consumer meter or 22.5% of the cost per consumer meter worked out for the whole project, whichever is lower, would be funded. To incentivize the States/UTs for deployment of prepaid Smart meters by December, 2023. An incentive @ 7.5% of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter, whichever is lower, would be provided for "Other than Special Category States" for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023. The incentive for Special Category States would be @ 11.25% of the cost per consumer meter worked out for the whole project or Rs. 675 per consumer meter, whichever is lower. The incentive would be met out of overall provision of GBS for Smart Metering under the Scheme (Rs. 23,300 crore) along with expected cost reduction benefits arising out of economies of scale looking to the large-scale deployment of prepaid Smart meters in first phase, similar to the huge reduction in price experienced in large scale use of LED bulbs and solar power.

Annexure – II

Indicative List of Reforms under PART-'A'

An indicative list of reforms / activities to be covered under the Scheme:

(i) Putting in place a mechanism to ensure that the Government Departments pay for the for electricity consumed, promptly

(ii) Putting in place a mechanism for ensuring that the consumption by the subsidized categories is accounted for properly and released to the DISCOM in advance as mandated by Section 65 of the Electricity Act 2003, which will be credited to the consumer account maintained by the DISCOM. Subsidy delivery must be targeted via Direct Benefit Transfer (DBT) for improvement in accountability

(iii) Annual Tariff Fixation, Tariff to reflect prudent costs; costs not reflected in Tariff shown separately, to be funded by the DISCOM/State Govt.; no Regulatory assets to be created, Multi Year Tariff (MYT).

(iv) Preparation of and adherence to a roadmap for funding accumulated and current financial losses, if any, through clearance of part or whole of regulatory assets and state funding.

(v) Energy Accounting with 100% feeder and transformer metering on OPEX model.

(vi) Corporate Governance reforms, Operation of part or whole area of supply of DISCOM through private participation or through CPSUs/JVs of CPSUs

(vii) Distribution Franchisee arrangements in some areas of DISCOM

(viii) Setting up electricity police stations in line with the provisions of the Electricity Act, 2003

(ix) Training and Capacity Building of existing manpower, Creation of IT cadre for management of IT/OT services or engaging knowledge partners / consultants for the same.

(x) Compliance of RPO trajectories

(xi) Publication of quarterly audited/unaudited reports in a standardized format circulated by PFC. Quarterly and Annual Accounts of DISCOMs need to explicitly include details of subsidy and Govt. Department dues. The annual accounts of the previous year would be published by DISCOMs latest by September 30th of the current year.

(xii) Initiation of performance linked transfer policy for DISCOM staff

(xiii) Any other activity which serves to achieve the objective of the Scheme.

Annexure – III

Results Evaluation Framework

The Results evaluation framework would have two components (i) Prequalifying criteria; and, (ii) Result evaluation matrix.

Pre-Qualification Conditions:

I. DISCOMs would publish quarterly un-audited accounts within 60 days of the end of each quarter during first two years of operation of the Scheme (i.e. for FY 2021-22 and FY 2022-23) and thereafter audited quarterly accounts within 45 days from 3rd year onwards.

II. Further, DISCOMs would publish audited annual accounts by end of December of the following year during first two years of operation of the Scheme (i.e. for FY 2021-22 and FY 2022-23) and thereafter audited annual accounts by end of September of the following year from 3rd year onwards.

III. DISCOMs will have ensured that no new Regulatory Assets have been created in latest tariff determination cycle.

IV. State Government to ensure 100% payment of subsidy for the previous year and advance payment of subsidy up to current period in line with section 65 of EA2003 and wipe out the remaining subsidy amount by the end of the project period.

V. All Government Department/ Attached Offices/ Local Bodies have made100% payment of current electricity dues for the year under evaluation.

VI. Progress commensurate to commitment in putting Govt. Offices on prepaid meters.

VII. No. of days Payables to Creditors / suppliers for the year under evaluation is equal to or less than the projected trajectory as per results evaluation framework.

VIII. Tariff order for the current year in which evaluation is being done and true up of penultimate year has been issued and implemented w.e.f. 1st April of current FY.

Utilities clearing the pre-qualifying criteria would be eligible for evaluation against the result evaluation matrix, which would determine their eligibility for release of funds for a particular year. The result evaluation framework would be different for each DISCOM and would be fixed for each year depending on the cumulative performance as well as the annual performance.

Four basic categories of Results Parameters have been identified and weightage has been assigned to each of the category as under:

Sr. No.	Category	Weightage for Evaluation
1.	Financial Sustainability	60
2.	Outcome of infrastructure Works	20
3.	Infrastructure Works	10
4.	Policy & Structural Reforms, Capacity Building and IT/OT Enablement	10
	Total	100

While the weightage of Financial sustainability would remain static at 60%, Monitoring Committee of the Scheme may make variations specific to the needs of the States/DISCOMs for other weightages

Under each of the categories above, there would be result parameters in the matrix, which will be assigned maximum marks on the basis of agreed priority/ significance towards achieving the objectives of the Scheme. The maximum marks and targets for individual parameters may differ for each of the evaluation years.

The funds for a particular year will be released only if the Utility clears the pre-qualifying criteria and the total weighted score is more than 60 marks on the evaluation matrix. Evaluation of parameters relating to financial accounts shall be based on audited quarterly/annual accounts.

Recognising that the year-wise emphasis on desired outcomes could be different, the Monitoring committee will reserve the right to allocate the maximum marks to individual result parameters for every year of evaluation. Result Evaluation Framework may be modified, if required, to include a smaller number of parameters and to exclude those included in the pre-qualifying criteria to avoid duplication and to make the Result Evaluation Framework simplistic.

RESULTS EVALUATION MATRIX (ILLUSTRATIVE)

Name of DISCOM: ____________________

SN	Result Parameters	Weightage	Unit of Measurement	Base Year [2020-21]	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
A.	**Financial Sustainability**	**60**						
1	ACS-ARR gap		Rs./kWh		25			
2	AT&C Loss - Increase in Billing and Collection Efficiency - Reduction in theft / line losses		%		25			
3	Outstanding/ Overdue Subsidy Payment by State Government		Rs. Crore		15			
4	Outstanding/ Overdue Government Dues		No. of Days Receivable		10			
5	Progress in putting Govt. Offices on prepaid meters		%		10			
6	No. of Creditor Days (including payment to Gencos for supply of power)		No. of days payable		5			
7	No. of Debtor Days		No. of days receivables		5			
8	Unliquidated Regulatory Assets		Rs. Crore		5			
	Sub Total (A)				Σ Max. Marks			Σ Score
	Weighted Score (A) = (Weightage x ΣScore)/ ΣMaximum Marks							
B	**Outcomes of Infrastructure works**	**20**						
1	Hours of supply (Rural)		Avg. Hours/ Day		20			
2	Hours of supply (Urban)		Avg. Hours/ Day		20			
3	Accurate Energy Accounts		%		20			
4	Reliability of power supply - SAIFI (System Average Interruption Frequency Index)		Nos. / year		20			
5	Reliability of power supply - SAIDI (System Average Interruption Duration Index		Hours or minutes/ year		20			

SN	Result Parameters	Weightage	Unit of Measurement	Base Year [2020-21]	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
	Sub Total (B)				Σ Max. Marks			Σ Score
	Weighted Score (B) = (Weightage x ΣScore)/ ΣMaximum Marks							
C.	**Infrastructure Works**	10						
1	**Metering**							
I	Consumer Metering		Nos.		10			
Ii	DT Metering		Nos.		20			
Iii	Feeder Metering		Nos.		20			
2	**Feeder Separation - % of total Agriculture feeders separated (Feeders with Agricultural load of >= 30% of total load of feeder)**		%		10			
3	Replacement of existing LT overhead bare conductor lines with AB/UG cable		Ckm		10			
4	% of Consumers with Prepaid Smart Meters (other than Govt. Deptt.)		%		15			
5	% of Govt Departments with Prepaid Smart Meters		%		15			
	Sub Total (C)				Σ Max. Marks			Σ Score
	Weighted Score (C) = (Weightage x ΣScore)/ ΣMaximum Marks							
D	**Policy & Structural Reforms, Capacity building and IT/OT enablement**	10						
1	SCADA		No. of Towns		15			
2	ERP Implementation		Yes/No		10			
3	Training of DISCOM Officials		Man-days		5			
4	Corporate Governance (Recommendations complied)		%		10			
5	Tariff Reforms (MYT / ToD / Cross Subsidy)				15			
6	Subsidy Delivery Mechanism/ DBT				15			

SN	Result Parameters	Weightage	Unit of Measurement	Base Year [2020-21]	Evaluation of Cumulative Improvement from Base Year up to Year under evaluation			
				(Values)	Max. Marks	Target	Achievement	Score
7	Consumer rights and grievance redressal				15			
8	Adoption of PPP mode				15			
	Sub Total (D)				Σ Max. Marks			Σ Score
	Weighted Score (D) = (Weightage x ΣScore)/ Σ Maximum Marks							
	Sum of Weighted Score (A+B+C+D)							

Note : In order to qualify for receipt of grant under the Scheme , the total weighted score should be 60 or more .

Annexure – IV

Indicative List of Works under Part – 'A'

An indicative list of works to be covered under the Scheme:

(i) Replacement of conductors, which are old/frayed
(ii) Additional HT lines to improve quality of supply
(iii) Segregation of agricultural feeders
(iv) Provision of Aerial bunched Cables (ABC) in high loss areas
(v) High Voltage Distribution System (HVDS) in high loss areas
(vi) Supervisory Control and Data Acquisition (SCADA) in all urban areas; and DMS in 100 urban centres above the population of 2.75 lakhs as per urban census 2011
(vii) Prepaid/Smart metering systems
(viii) Works like new feeders, capacitors, etc for loss reduction
(ix) IT/OT enablement works
(x) Prepaid metering for all Government Departments
(xi) Distribution Works for system strengthening
(xii) Transformer / Feeder Metering – on OPEX Model

Segregation of feeders dedicated only for supply of power for agricultural purpose, which are proposed to be solarized under Kisan Urja Suraksha Evam Utthan Mahabhiyan (KUSUM) Scheme will be sanctioned on priority under the Scheme. Further, feeders once segregated will not be used for serving other than agricultural loads.

Annexure – V

Part B: Training & Capacity Building and Other Enabling & Supporting Activities

The major components covered under the Part B of the Scheme are:

I. Augmentation of Smart Grid Knowledge Centre including AI

Smart Grid Knowledge Center (SGKC) at PGCIL, Manesar is a facility developed under assistance from the Integrated Power Development Scheme (IPDS). The center has been established to act as resource center for smart grid activities in the country with various smart grid technologies on display on a lab scale. It also has state of the art Smart grid training facilities. SGKC will be upscaled as an incubation center for evaluating and disseminating new technologies, and also as an innovation park. An amount of Rs 30 Crores is earmarked for expansion of centers' activities with 100% gross budgetary support. These funds would also be used for creation of Center for development of applications related to use of Artificial Intelligence in Distribution Sector.

II. Training / Capacity building/ Awards and incentives

Training and capacity building of professionals in the Distribution Sector is a much-felt need. Training in good corporate governance practices, technical matters, advance technology intervention areas, new business processes, etc. both in India and abroad are envisaged under this head. The details of the training programs will be finalized by the Monitoring Committee.

Ministry of Power will institute various awards and incentives for DISCOM personnel and management for showing exemplary performance in areas both within and beyond the realm of the Scheme. These will be instituted with the approval of Monitoring Committee.

III. Reforms support in form of consultancy

The Scheme also envisages consultancy support for reform implementation. Ministry of Power, through the Nodal Agency, will appoint consultants both at national and state/regional levels based on the action plans finalized by the Monitoring Committee who will advise and assist MoP and States/DISCOMs in Scheme implementation, especially the reforms in DISCOMs

The consultancy support provided by the MoP to Union Territories for privatization of Power Departments/ Utilities under AatmaNirbhar Bharat Abhiyan will also be funded out of this component. The details of the consultancies shall be finalized by the Monitoring Committee. The costs towards this consultancy for the Scheme period will be borne by the Ministry of Power out of allocation under Part-B of the Scheme.

IV. Nodal agency fee, MoP enabling activities and PMA charges

This head will cover various enabling activities viz. communication plan, consumer awareness and other associated measures such as third-party evaluation, nodal agency fee and PMA charges etc.

No. 10/03/2021-UR&SI-II(E- 258311)

Appendix-II

Government of India

Ministry of Power

*****

Shram Shakti Bhawan, Rafi Marg

New Delhi the 20th July 2021

OFFICE MEMORANDUM

Subject: Constitution of Monitoring Committee for implementation of Revamped Distribution Sector Scheme: A Reforms based and Results linked Scheme. – regarding

The "**Revamped Distribution Sector Scheme - A Reforms based and Results linked Scheme**" has been approved by Government of India with the objective of improving the quality and reliability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector.

2. A Monitoring Committee for the scheme is being constituted comprising the following members:

(i)	Secretary, Ministry of Power	Chairperson
(ii)	Chairperson, Central Electricity Authority	Member
(iii)	Principal Advisor (Energy), NITI Aayog	Member
(iv)	Joint Secretary, Ministry of Finance (D/o Expenditure)	Member
(v)	Joint Secretary, Ministry of New and Renewable Energy	Member
(vi)	Joint Secretary, Ministry of Home Affairs	Member
(vii)	Joint Secretary, Ministry of Electronics and IT	Member
(viii)	Additional Secretary(Distribution),Ministry of Power	Member
(ix)	Additional Secretary & Financial Advisor, Ministry of Power	Member
(x)	Joint Secretary (Distribution), Ministry of Power	Member
(xi)	CMD, Power Finance Corporation Ltd.	Member
(xii)	CMD, PGCIL	Member
(xiii)	DG, Bureau of Energy Efficiency (BEE)	Member

(xiv)	Director, NPMU	Member
(xv)	CMD, REC Ltd.	Member Secretary & Convener

3. The Monitoring Committee will frame and approve all operational guidelines, sanction all Action Plans & DPRs of DISCOMs / States and proposals/DPRs under Part-B, and review and monitor implementation of Scheme including review of Third-Party Mid-Term Evaluation of the Scheme carried out by the Nodal Agency.

4. The Monitoring Committee will exercise powers vested with it in terms of OM No 20/9/2019-IPDS dated 20th July, 2021 issued by Ministry of Power for implementation of Revamped Distribution Sector Scheme. In addition, the Monitoring Committee would also exercise powers vested with it in terms of the OM No 44/44/2014-RE dated 17th December, 2014 and OM No 26/1/2014-APDRP dated 15th December, 2014 in respect to issues pertaining to the DDUGJY,IPDS and PMDP Schemes respectively, including on their subsumed components.

5. REC Ltd. and Power Finance Corporation Limited being the Nodal Agencies will provide necessary secretarial assistance such as manpower, material and other logistic support to the committee for smooth implementation of the scheme.

6. The members of the Committee will draw TA/DA if any, from their respective offices.

7. This issues with the approval of Hon'ble Minister of Power, and New & Renewable Energy.

Srikanth

(M. Srikanth Reddy)
Deputy Director(UR&SI-II)
Tel.No.011-2339108

To

1. All Members of the Monitoring Committee.
2. CMD, REC Ltd.

Copy to:

1. PS to Hon'ble Minister of Power
2. PS to Hon'ble Minister of State for Power
3. Sr. PPS to Secretary (Power)
4. PPS to AS(Distribution),/PPS to AS&FA, Ministry of Power
5. PPS to JS(Distribution), Ministry of Power
6. PPS to Director (UR&SI)/ PS to Director (Distribution Schemes), Ministry of Power

Appendix-III

Allocation of States between Nodal agencies

States and UTs allocated to REC

1. Assam
2. Meghalaya
3. Arunachal Pradesh
4. Chhattisgarh
5. J&K
6. Ladakh
7. Goa
8. Tamil Nadu
9. Karnataka
10. Bihar
11. Rajasthan
12. Uttar Pradesh
13. West Bengal
14. Andaman Nicobar
15. Sikkim
16. Mizoram
17. Manipur
18. Nagaland
19. Tripura

States and UTs allocated to PFC

1. Maharashtra
2. Gujarat
3. Andhra Pradesh
4. Telangana
5. Kerala
6. Madhya Pradesh
7. Uttarakhand
8. Odisha
9. Jharkhand
10. Punjab
11. Haryana
12. Himachal Pradesh
13. Chandigarh
14. Delhi
15. Puducherry
16. Lakshadweep
17. DNH and Daman & Diu

THE BRIHAN MUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
(OF THE BRIHAN MUMBAI MAHANAGARPALIKA)

☏ : 2377 5544, 2374 3933
Mob.: 9867830770
E_MAIL: mypednekar@bestmmd.net

ADD: MATERIALS MANAGEMENT DEPT.
Bijlee Bhavan, 2nd Floor, Mazagaon,
Kussara Bunder Road, Mumbai–400 010.

Ref.: DMM/SB/06/T-TA73759/4494/2022-23 Date: 30.09.2022

ADANI TRANSMISSION LIMITED
Adani Corporate House, Shantigram,
Near Vaishnodevi Circle,
S. G. Highway,
AHMEDABAD – 382 421

Kind attn.: Shri. Vaibhav Tandon
(Asst. Vice President)

E-mail: tandon.vaibhav@adani.com

Dear Sirs,

Sub: Letter of Award for Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Implementing Prepaid Smart Metering Project in the Brihan-Mumbai Electric Supply & Transport Undertaking (BEST) on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis

Ref.: 1. Tender No. DMM(SB)I/06/TCU/73759/2022-23/Advt., opened under Reverse Auctioning mechanism with Techno-commercial bids opened on 21.07.2022 & Price bids opened & Reverse Auction carried out on 06.09.2022
2. A. R. No. 97 dtd. 29.09.2022

This is in reference to your proposal in relation to the Request for Proposal (RFP). Pursuant to the evaluation of the bid, your bid has been found to be most suited. Vide A. R. No. 97 dtd. 29.09.2022, the Administrator (BEST Committee) has approved the proposal to enter into contract with the firm viz. Adani Transmission Limited for Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Implementing Prepaid Smart Metering Project in the Brihan-Mumbai Electric Supply & Transport (BEST) Undertaking on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis.

We are, therefore, pleased to inform you that the BEST Undertaking has accepted your offer, the details of which are as shown below:

Description	**Basic Rate Rs.P.**	**Gross Rate Rs.P.**	**Approx. Total Cost Rs.P.**
Appointment of Advanced Metering Infrastructure (AMI) Service Provider for Implementing Prepaid Smart Metering Project in the Brihan-Mumbai Electric Supply & Transport Undertaking (BEST) on DBFOOT basis as per the Undertaking's Technical Specifications	11,04,37,55,237.00	13,03,16,31,179.89	**13,03,16,31,179.89**

You are, therefore, requested to please take steps for incorporation of the SPV in terms of the RFP for execution of the AMISP contract. The execution of the AMISP contract shall happen only after you have furnished the Performance Security in terms of the RFP.

TERMS & CONDITIONS:

a)	**PRICES**	:	Unconditionally 'Firm' throughout the contractual period. The detailed price breakup is as per attached Annexure-A.
b)	**TAXES & STATUTORY LEVIES**	:	SGST @ 9% & CGST @ 9%. However, those applicable at the time of supply will be charged.
c)	**TERMS OF PAYMENT (CONTRACT PRICE & PAYMENT)**	:	As per the attached Annexure-B.
d)	**SCOPE OF WORK**	:	As per the attached Annexure-C.
e)	**WARRANTY CLAUSE**	:	i) The AMISP warrants that all the Goods that would be used as part of Solution would be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the contract. ii) The AMISP further warrants that the Goods shall be free from defects arising from any act or omission of the AMISP or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination iii) The warranty of the AMI system including field and remote Hardwares, software and meters shall remain valid till expiry of the contract Period. iv) The AMISP shall be responsible for comprehensive maintenance of all the equipment and systems supplied & installed under this contract during the Operational Period. There may be some variation during detailed engineering. AMISP will have to make their own assessment of the systems and deploy manpower accordingly. However, it is to be ensured that specified manpower of requisite qualification is deployed. v) The maintenance of the system supplied & installed by the AMISP shall be comprehensive. The AMISP shall be responsible for providing all the spares as may be required. The spares shall be maintained by the AMISP at no extra cost to the Utility/AMI-IA. vi) At the end of the contract or at the time of transfer in case of termination, the meters shall have a warranty of 5 years from their installation.

f)	**PERFORMANCE SECURITY**	:	i) The AMISP shall furnish Performance Security in the form of an irrevocable bank guarantee valid up to a period of 6 (six) months beyond the end of the contract Period or extended thereafter, for the amount indicated in Special Conditions of contract (SCC) on the prescribed format. However, in case of delay in Installation Milestone, the validity of the initial Performance Security shall be extended by the period of such delay. In the event delay is solely due to acts and/ or omission of the AMI-IA cost of extending the validity of Performance Security shall be reimbursed to the AMISP by the AMI-IA. ii) Upon achievement of Installation Milestone, the value of the Performance Security shall be reduced by AMISP, to the extent indicated in SCC as determined in accordance with numbers of meters considered for Installation Milestone. iii) Any payments shall be made to the AMISP only after receipt of the initial Performance Security by AMI-IA. iv) Upon Termination of the contract due to AMI-IA Event of default or expiry of the contract Period, the separate Performance Security shall be discharged by AMI-IA without any interest and returned to the AMISP not later than 14 (fourteen) working days following the date of Termination of the contract. Upon Termination of the contract due to AMISP Event of default, the Performance Security shall be forfeited by AMI-IA. v) In case of any delay by the AMISP in performing the activities of the scope of work with respect to the Project Implementation Schedule, then upon AMI-IA's request, the AMISP shall extend the validity of the separate Performance Security for the period for which the contract is extended. In the event delay is solely due to acts and/ or omission of the AMI-IA cost of extending the validity of separate Performance Security shall be reimbursed to the AMISP by the AMI-IA.
g)	**LIQUIDATED DAMAGES, PENALTY & INCENTIVES CLAUSE**	:	i) Except in case of Force Majeure or where the delay in delivery of the Solution is caused due to any delay or default of AMI-IA if the Installation Milestone is delayed by more

			than 30 (thirty) months from the date of execution of the contract the AMISP shall be liable to pay liquidated damages as per the specified rates. ii) Except in case of Force Majeure or where the delay in delivery of the Solution is caused due to any delay or default of AMI-IA if the delivery, site installation, integration and operationalization of 100% of Feeder Meters each with related hardware, software and equipment is delayed by more than 9 (nine) months from the date of execution of the contract the AMISP shall be liable to pay liquidated damages as per the specified rates. iii) AMI-IA shall without prejudice to all its other remedies under the contract, deduct from the amount due to be paid, as liquidated damages, 50% of AMISP Service Charge for each delayed meter for each completed month of delay for a maximum period of 12 (twelve) months. An illustrative example for arriving at the deductions is given in SCC. iv) If the AMISP achieves milestone of "Installation Milestone atleast one month in advance than the timelines specified in the contract, AMI-IA shall provide an incentive as specified in SCC. v) Upon achieving Installation Milestone, AMISP shall be entitled to raise a supplementary invoice for the amount indicated therein. The Supplementary invoice shall be paid along with the amount due to be paid for AMISP Service Charges for the immediately succeeding month.
h)	**<u>QUANTITY VARIATION CLAUSE</u>**	:	AMI-IA reserves the right to increase or decrease the number of items under the AMI-SP contract subject to the limit of -20% (twenty percent) upto +30% (thirty percent) of the existing no. of items, covered under the AMI-SP contract, without any change in the unit prices or other terms and conditions of the AMI-SP contract and the Bid.
i)	**<u>CONTRACT VALIDITY PERIOD (EFFECTIVENESS & TERM)</u>**	:	i) This contract shall come into force and effect on the date of execution of the contract by the Parties; ii) Unless terminated earlier by either Party or extended by the AMI-IA in accordance with the terms of this contract, this contract shall continue in full force and effect until the earlier of (a) 10 (ten) years from the date of execution of the

			contract or (b) As soon as the "Meter-Months" exceeds "Total Meter- months" ("Term of the contract"). iii) The AMI-IA, at its own discretion, may extend the operation and maintenance period of the AMI system at terms mutuallyagreed upon with the AMISP.
j)	**PROTOTYPE & LOT INSPECTION**	**:**	i) Prototype Inspection: The Prototype inspection is applicable for this particular tender and the Undertaking's officers shall visit the firm's factory premises to inspect quality of Prototype produced and the Undertaking shall bear the expenditure of to and fro travelling, lodging and boarding of the Undertaking's two inspecting officers. The Prototype meters will be carefully preserved by BEST Undertaking for the guarantee period of five years. If any deviation is observed in the meter supplied by the Tenderer in subsequent lot, the meter(s) with deviation will be liable to be rejected. ii) Lot Inspection: The Lot Inspection is applicable for one Lot preferably first for this particular tender and the Undertaking's officers shall visit the firm's factory premises to inspect the quality of Lot produced and the Undertaking will bear the expenditure of to and fro travelling, lodging and boarding of the Undertaking's two inspecting officers. For subsequent visits required, if any, the Undertaking will bear the expenditure.
k)	**OTHER CONDITIONS**	**:**	In case any upfront payment is made by the Undertaking, then the monthly payable amount shall be reduced based on the then calculated Net Present Value (NPV).

You will be required to furnish Performance Security for the amount equivalent to Rs.39,09,48,936.00 in the form of Bank Guarantee valid for the period of 126 months from the date of release of this Letter of Award. For scrutiny of Bank Guarantee, you will have to pay Administrative Charges of Rs. 2,000/- + GST @ 18% in our Cash Department at Colaba or Dadar.

Further, this Letter of Award is also subject to other terms and conditions which are incorporated in the tender document and there shall be no change whatsoever in the Terms & Conditions as set out in the Draft contract. After receipt of Performance Security and signing of AMISP Contract Agreement, the Purchase Order will be released. Till that time, for all purposes, this Letter of Award shall be treated as Purchase Order.

The terms & conditions as set out in this Letter of Award shall stand valid until execution of AMISP contract. Please acknowledge the receipt and return the duplicate copy of this Letter of Award after signing & stamping it in all the pages to the undersigned as a token of acceptance.

Encl.: 1. Annexure-A
2. Annexure-B
3. Annexure-C

Yours faithfully,

(M. Y. Pednekar)
DY. MATERIALS MANAGER (SB)I

ANNEXURE-A

DETAILED PRICE BREAKUP (AS PER REVERSE AUCTION)
NAME OF THE FIRM: ADANI TRANSMISSION LIMITED (TR.3)

Sr. No.	Description of item	Quantity	Proc. unit	Basic Rate (per unit) Rs. P.	Gross Rate (per unit) Incl. of GST @ 18% Rs. P.	Item-wise contractual value Rs. P.
1.	**Complete AMI Infrastructure:**					
1.1	Supply, installation, integration, testing and commissioning of Single phase whole current Smart Meter with inbuilt NIC module – (Consumer Meter) (Inclusive of 10 net meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability.	901212	Nos.	9,332.06	11,011.83	9,92,39,93,337.96
1.2	Supply, installation, integration, testing and commissioning of Three Phase whole current Smart Meter with inbuilt NIC module (Inclusive of Existing 212 nos. Solar /Net Meter & 15573 nos. (without solar/net meters) of whole current 50 - 100 A size Meters consumers) – Consumer Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability.	168419	Nos.	13,933.31	16,441.31	2,76,90,28,988.89
1.3	Supply, installation, integration, testing and commissioning of Three Phase HT current Smart Meter with inbuilt NIC module (Inclusive of 12 nos. Existing Solar/Net Meter Consumers) – Consumer Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability.	206	Nos.	34,321.60	40,499.49	83,42,894.94
1.4	Supply, installation, integration, testing and commissioning of Three phase LT-CT operated Smart Meter with inbuilt NIC	6053	Nos.	17,160.70	20,249.63	12,25,71,010.39

Sr. No.	Description of item	Quantity	Proc. unit	Basic Rate (per unit) Rs. P.	Gross Rate (per unit) Incl. of GST @ 18% Rs. P.	Item-wise contractual value Rs. P.
	module (Inclusive of 97 nos. Existing Solar/Net Meter Consumers) – Consumer Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability.					
1.5	Supply, installation, integration, testing and commissioning of Three phase LT-CT operated Smart Meter with inbuilt NIC module (with Net-Metering) – DT Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability.	3398	Nos.	17,160.70	20,249.63	6,88,08,242.74
1.6	Supply, installation, integration, testing and commissioning of Three phase CT/PT operated Smart Meter with inbuilt NIC module – Feeder Meter (with suitable box & TTB arrangement for individual meters meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability.	1255	Nos.	34,321.60	40,499.49	5,08,26,859.95
1.7	Supply, installation, integration, testing and commissioning of Three phase CT/PT operated Smart Meter with inbuilt NIC module (ABT Meters) (With Suitable box & TTB arrangement for individual meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability.	133	Nos.	88,255.50	1,04,141.49	1,38,50,818.17
1.8	Supply and installation of Meter Boxes for DT check meters	3398	Nos.	1,705.40	2,012.37	68,38,033.26

Sr. No.	Description of item	Quantity	Proc. unit	Basic Rate (per unit) Rs. P.	Gross Rate (per unit) Incl. of GST @ 18% Rs. P.	Item-wise contractual value Rs. P.
1.9	Supply and installation of LT Compact CTs of LT CT Meters (Set of 3 CTs)	6053	Nos.	2,131.67	2,515.37	1,52,25,534.61
1.10	Supply and installation of LT CTs for DT metering (Ring Type)	5610	Nos.	2,131.67	2,515.37	1,41,11,225.70
2.0	**New requirement for software (Estimated):**					
2.1	Architecture Specialists (Experience- 10+ years)	12	Man months	2,13,180.00	2,51,552.40	30,18,628.80
2.2	Security Specialists (Experience- 10+ years)	12	Man months	1,91,859.71	2,26,394.46	27,16,733.52
2.3	Integration Specialists (Experience- 10+ years)	12	Man months	1,91,859.71	2,26,394.46	27,16,733.52
2.4	Data Base Developer- Sr. (Experience- 5+ years)	24	Man months	1,49,224.00	1,76,084.32	42,26,023.68
2.5	Web/ Mobile Application Developer- Sr. (Experience- 5+ years)	24	Man months	1,49,224.00	1,76,084.32	42,26,023.68
2.6	Core Application Developer- Sr. (Experience- 5+ years)	24	Man months	1,70,542.00	2,01,239.56	48,29,749.44
2.7	Data Base Developer- Jr. (Experience- Less than 5 years)	36	Man months	1,27,906.00	1,50,929.08	54,33,446.88
2.8	Web/ Mobile Application Developer- Jr. (Experience- Less than 5 years)	36	Man months	1,27,906.00	1,50,929.08	54,33,446.88
2.9	Core Application Developer- Jr. (Experience- Less than 5 years)	36	Man months	1,27,906.00	1,50,929.08	54,33,446.88
					Total Contractual Value:	**13,03,16,31,179.89**

ANNEXURE-B

SCOPE OF WORK

1. "Advance Metering Infrastructure Service Provider (AMISP)" or the "AMISP" shall Design, Build, Finance, Own, Operate, Transfer (DBFOOT) the Advance Metering Infrastructure (AMI) Project in the pre-paid (by default) mode in selected AMI Project Area. The AMISP shall finance and implement the project including end-to-end smart metering, operate for 'Total Meter-months' as defined in this Contract and thereafter transfer the ownership of the entire system including all the hardware, software along with its valid licenses, and any data collected during the Project to the AMI-IA at the end of the Contract Period to facilitate seamless operation of AMI-IA businesses. AMI-IA shall make payments to the AMISP in accordance with the terms and conditions of this Contract.

2. **The AMI Project Area:**

The AMI Project shall cover end-to-end smart metering (from Feeders, Distribution Transformers (DTs) and all end consumers) at contiguous electrical locations (which will be ring fenced with boundary meters) to enable complete energy accounting with zero manual intervention and dispersed metering (for certain Industrial, Commercial and Government consumers) at non-contiguous electrical locations in the selected AMI Project Area.

3. A) **About Project Area:**

The area wise details along with project area coverage, no. of consumers, category of consumers and DTs in these areas is detailed in Annexure S of Section 6 for both the Lots i.e. Lot A & Lot B. It is to note that the details have been provided based on the available data with an objective of saturation of feeders completely. The same has to be ensured during field survey and finalization of consumer base for installation.

Further, the bidder jointly with AMI IA team shall prepare field installation and roll-out strategy prioritizing the following:

1. High Consumption Centers
2. Priority to DT metering
3. Commercial Consumers
4. Govt. Connections

Further, the readiness of AB cabling should be taken into account during strategy making.

Number of single phase whole current Smart Meters (with/without net-metering), three phase whole current Smart Meters (with/without net-metering), LT-CT operated three phase Smart Meters (with/without net-metering), Three HT Smart meters and CT/PT operated three phase Smart meters to be installed;

Meter Type	**Qty.**
Single Phase Meter-WC	9,01,212
Three Phase Meter-WC	1,68,419

Three Phase Meter- LTCT	6,053
Three Phase Meter- LTCT - DT METER	3,398
Three Phase Meter- HT METER	206
Three Phase Meter- HT -FEEDER METER	1,255
Three Phase Meter- CT/PT OPERATED ABT Meters	133
Grand Total:	**10,80,676**

**Base quantity of meters is 10.5 lakhs. Total Quantity mentioned indicative based on projected growth estimate of 1%

B) **Other Details**:

a) The data is to be captured at a periodicity of 15 mins. The AMI system till HES thus deployed should be integrated to the MDM being deployed under the ongoing project. The bidder to provide data in the requisite format/periodicity as per the deployed solution for seamless operation of the entire system;

b) The infrastructure for recharge through feature phones/ offline channels be adopted based on one kiosk per existing bill pay centre for the total no. of meter months.

c) Meters to be covered through RF mesh or 4G LTE/5G with fallback provision.

1.3 The AMI system should be designed such that all the required hardware, software, and firmware with upgrades satisfy the AMI system requirements and service level agreements as specified in this Contract while considering technical obsolescence over the operating life of the system and suitability for future scale up. AMISP is free to decide upon the best solution out of all the available options. However, the entire responsibility of fully functional AMI system shall rest with the AMISP in order to meet the performance levels as given in the Contract. The AMISP shall ensure that the Solution complies with the Applicable Law, technical specifications and other provisions of the Contract.

1.4 **Brief Scope of Work:**

AMISP shall include, in complete conformity with the technical and financial bid as mentioned in this contract as well as AMI system requirements and Service Level Agreements as mentioned in this Contract and Applicable Laws.

The Scope of work of AMISP shall include site survey, planning, designing, financing, engineering, manufacturing, supply, transportation & insurance, delivery at site, unloading, handling, storage, installation, integration, testing, commissioning, demonstration for acceptance, training, maintenance, operation and documentation of various AMISP components. Given below:

A. Supply, installation, integration, testing & commissioning of:
   a. Smart pre-paid metering as per Clause 2.1 of this Section.
   b. Communication Infrastructure to ensure the performance levels provided in this Contract as per Clause 2.2 of this Section;

	c. Head End System (HES) and deployment on cloud as per Clause 2.3 of this Section; d. Network Operation cum Monitoring Centre (NOMC) with suitable backend communication infrastructure, hardware and power supply as per Clause 2.6 of this Section; e. All other necessary software along with valid licenses relevant to the Project (as per Clause 2.7 of this Section); f. HES data can be hosted on secured cloud by AMI SP for the agreement period. In case AMI-IA want to shift the data to on-premises or any other cloud, the AMI SP shall transfer the entire data along with the systems and configure all associated similar connecting network facilities / monitoring and management (administration) tools / software solutions framework for normal functioning state without any additional charges. B. AMI System integration as per Clause 3 of this Section; C Consumer indexing on de-novo basis for contiguous electrical locations in the selected AMI Project Area along with its regular updates during contract period as per Clause 4 of this Section; D. Development of a comprehensive consumer engagement plan (as per Clause 5 of this Section) related to different stages of implementation (Pre, during and post installation phases of smart metering) in consultation with AMI-IA and implement its part of its activities as per the developed plan. The plan at the minimum should include consumer engagement activities to be undertaken at AMI-IA's headquarter, division and sub-division level as well as communication and media plan; E. Operation, maintenance, and support services after the successful completion of the Operational Go-Live of the system as per Clause 7 of this Section; F. Training of personnel, as required for efficient, viable and fully functional system as per Clause 8 of this Section.
1.5	Guidelines for testing, inspection, approval of test records and in general, management of the Quality Assurance / Quality Control program of the AMI project as given in Clause 9 of this Section shall be generally adhered to.
1.6	Guidelines for project management as given in Clause 10 shall generally be adhered to.
1.7	The AMISP shall be required to submit project documentation describing the system operations for information/ approval as per Clause 11 to the AMI-IA.
1.8	Unless otherwise stipulated in the RFP or Contract, the scope of work shall include all such items not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for comprehensive, successful and satisfactory implementation of the Solution as if such items were expressly mentioned in the Contract. The same may be mutually enlisted and agreed upon by AMI-IA and AMISP during the

	design phase as defined in the Contract;
1.9	Wherever references are made in the RFP to codes and standards in accordance with which the Solution shall be executed, the edition or the revised version of such codes and standards shall be those specified in the scope of work;
1.10	The systems which are at a risk of technical obsolescence over the operating life of the system should be identified; this should include end-of-sale and end-of-support policies governing the proposed technologies. Forward and backward compatibility need to be considered and mitigation option shall be indicated in detail and shall not be limited to periodic update from OEM/System supplier
1.11	**<u>Exclusion from Scope of Work: Following shall be excluded from AMISP's scope of work</u>** a. Construction of building for AMI Network Operation cum Monitoring Centre; b. Lighting system for AMI Network Operation cum Monitoring Centre; c. Interior and Integrated Building Management System (IBMS) of building for AMI Network Operation cum Monitoring Centre; d. Air conditioning and ventilation for AMI Network Operation cum Monitoring Centre; e. Firefighting system for AMI Network Operation cum Monitoring Centre; f. A.C input power and back-up supply for AMI Network Operation cum Monitoring Centre; g. Service cable including electrical neutral connectivity to the transformer, wherever applicable; h. Any modifications required in the existing system of the Utility (Billing, Website, etc.). i. Consumer indexing for dispersed metering at non-contiguous electrical locations in the selected AMI Project Area.
1.12	**<u>Responsibilities of the AMI-IA</u>**: The Chairman/Managing Director of AMI-IA or any other person designated by the Chairman/Managing Director of AMI-IA shall act as the nodal point for the implementation of the Contract and for issuing necessary instructions, approvals, commissioning, acceptance certificates, payments etc. to the AMISP. The AMI-IA shall: a) Whenever implementation of any component of the Solution requires that the AMISP obtain permits, approvals, and import and other licenses from local public authorities, if so required by the AMISP, make its best effort to assist the AMISP in complying with such requirements in a timely and expeditious manner; b) Erection of requisite structure for installation of boundary meters and corresponding ringfencing of Project Area. c) The Chairman/ Managing Director of AMI-IA or any other person designated by the Chairman/ Managing Director of AMI-IA shall approve all such documents required for

completion of Pre-Operational Go-Live Phase, in accordance with Clause 11 of this Section, within 15 (fifteen) working days from the date of submission of such documents;

d) Provide on AMISP's request, particulars/ information / or documentation that may be required by the AMISP within 30 (thirty) days from date of execution of the Contract to enable preparation of the Project Implementation plan by the AMISP;

e) Provide existing database of consumer indexing and physical & IT infrastructure as available with the AMI-IA. AMI-IA shall provide all required data to the AMISP to identify all the consumers connected on the identified sub-stations, feeder lines and transformers of the AMISP Project area;

f) Review and approval of AMISP's Project Implementation Plan;

g) Provide drawings for NOMCbuilding where AMI system installations are planned;

h) Provide necessary inputs for developing a comprehensive consumer engagement plan;

i) Provide necessary approvals for shutdowns as required for implementing the AMI System;

j) [Storage and disposal of replaced old meters];

k) Implement consumer engagement plan with support of AMISP. This would include running media campaign to raise awareness and countering myths around smart metering prior to installation, providing SOPs for smart meter installation to AMISP, etc.;

l) Keep AMISP informed of any changes in the area network during the project installation and operation period. Furthermore, AMI-IA will partner with AMISP for discovering/ updating consumer indexing (DT/ Feeder wise) after installation of smart meters through structured power events dataanalysis including scheduling such events for each node with minimum inconvenience to consumer;

m) Provide A.Cpower supply inputs;

n) Provide all required documents for delivery of material at site;

o) Provide at its expense, the electrical energy required for performance of the Project activities,installation, testing, and operation of the AMI Systems;

p) Providing support and access to facilities at the sites, including consumer premises;

q) Arrange for necessary shutdowns and work permits;

r) Implement major civil works such as expansions or construction of rooms, trenches etc. as requiredfor the AMI equipment;

s) Ensure that sites for installation for Smart Meters are ready along with service cable including electrical neutral connectivity to the transformer, wherever applicable for AMISP;

t) Provide the required integration interface details of the existing billing enterprise and related information required for Operational Go-Live of the AMI system, within 6 (six)

	months from date of execution of the Contract; u) Provide necessary clearance/ approval/ permits that are to be issued by it for initial 20% of contiguous electrical locations for Smart Meter deployment along with related documentation within 6 (six) months from date of execution of this Contract. Provide necessary clearance/ approval/ permits to be issued by it for remaining contiguous electrical locations as well as non- contiguous electrical locations for Smart Meter deployment along with related documentation on quarterly basis. AMI-IA shall endeavor to provide 20% of contiguous electrical locations cleared each quarter and complete area within 18 (eighteen) months from date of execution of the Contract. Utility/AMI-IA shall issue a Notice (provided if the Utility/AMI-IA has not been able to provide clearance/ approval/ permits for installation of the meters) no later than 7 days of expiry of time period specified above confirming the actual number of meters for which clearance/ approval/ permits is available. v) Review the specifications of the Goods proposed to be used to ensure compliance with the provisions of this Contract. w) Provide reasonable support to the AMISP for the Operational Go-Live in terms of the provisions of this Contract x) Provide necessary support to AMISP in the Project area, in relation to (amongst others) access to Utility's/AMI-IA's/consumers premises, installation of AMI system, repair and maintenance services, etc. Utility/AMI-IA shall also: i. Give access to AMISP supervisor or its operation & maintenance staff to work in the Project area during the Contract Period; ii. Provide an office space for AMISP personnel as mentioned in Clause 10 of this Section document within the Utility/AMI-IA premises; iii. Give access to AMISP to use existing power and water supply, and other necessary equipment, as mutually agreed with the AMISP; iv. Not move, remove, modify, alter, or change the AMI system or any part thereof in the boundary of the AMI system installed by the AMISP without the prior written consent of AMISP. Utility/AMI-IA shall take all reasonable steps to protect the AMI system from damage or injury and shall follow procedure for emergency action provided in advance by AMISP; y) Participate in periodic review meetings as per the project governance structure, and shall support with the required interventions requested; z) Be responsible for operation and maintenance of power supply system, and promptly attend to any break down including repair or replacement of any equipment used/needed for maintaining continuity of electricity supply for AMI system operation; aa) Permit AMISP to perform the project activities during working hours, and also after

working hoursas necessary, to meet the requirements of Project Implementation Plan;

bb) Provide necessary support in creation of pre-payment infrastructure;

cc) Attend to any irregularity with respect to AMI system operation, the cause of which has been brought to its attention by the AMISP;

dd) Promptly notify the AMISP of any events or circumstances that could affect the Project outcomes, or the AMISP's Services and obligations under this Contract;

ee) Allow AMISP (and/or its implementation partner, investor(s), authorized agency) unfettered access to network operation cum monitoring centre. Such covered and enclosed space as required by AMISP shall be provided to it by Utility/AMI-IA free of cost during the Contract Period;

ff) Cooperate with AMISP in arranging financing for the Project, including by signing any relevant documents (such as substitution Contract) and providing such approvals, no-objections and waiversas may be required by investors/lenders;

gg) Appoint and notify to AMISP of the names and contact details of the Utility/AMI-IA representative and its dedicated staff for the Project, which would include:

i. An engineer-in-charge for the Project who shall render full support to AMISP for Service delivery during the Term of this Contract and shall coordinate for payment to AMISP;

ii. A nodal officer, Utility/AMI-IA Project Manager, to co-ordinate with AMISP in relation to the Project.

hh) Maintain consumer expectations basis the consumer engagement plan; Certify Installation Milestone in accordance with the provisions of this Contract.

ii) Facilitate AMISP for the timely implementation of the AMI Project and for its successful operation and maintenance during the Contract Period;

AMI-IA to select one of these two and accordingly provide clear directions on the same as well as select relevant point 3.3.1.b

kk) Release payments to AMISP as per agreed terms;

ll) At its own cost, replace or repair existing equipment (other than AMI systems), such as poles, cables including consumer service lines, and transformers etc. where necessary to make the AMI system operational and/ or safe from hazards and maintain in proper working condition all portions of all facilities that are not included in the AMISP's scope of maintenance;

mm) Provide all other necessary support as may be required time to time.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

Maharashtra Electricity Regulatory Commission (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulations, 2021

ELECTRICITY ACT, 2003

No. MERC/Legal/2021/66 - In exercise of the powers conferred by the proviso to sub-section (1) of Section 43 read with clause (t) of sub-section (2) of Section 181 and clause (a) of sub- section (2) of Section 45 read with clause (u) of sub-section (2) of Section 181, sub-section (5) of Section 45, Section 46, sub-section (1) and sub-section (4) of Section 47 read with clause (v) and clause (w) of sub-section (2) of Section 181 and Section 50 read with clause (x) of sub-section (2) of Section 181 and sub-section (1) and sub-section (2) of Section 57 read with clause (za) of sub-section (2) of Section 181, Section 59 and clause (zp) of sub-section (2) of Section 181 of the Electricity Act, 2003,. the Maharashtra Electricity Regulatory Commission hereby makes the following Regulations, namely:

1. Short Title, Scope Extent and Commencement

1.1. These Regulations may be called the "Maharashtra Electricity Regulatory Commission (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulations, 2021. (hereinafter referred to as 'the Code')

1.2. Save as otherwise provided in this Code, Maharashtra Electricity Regulatory Commission (Electricity Supply Code and Other Conditions of Supply) Regulations, 2005 and Maharashtra Electricity Regulatory Commission (Standards of Performance of Distribution Licensees, Period for Giving Supply and Determination of Compensation) Regulations, 2014 are hereby repealed.

1.3. Notwithstanding such repeal anything done or action taken or purported to have been taken, or proceedings initiated under such repealed Regulations, shall be deemed to have been taken under this Code to the extent that same were not inconsistent with the Act; and

1.4. All the forms and formats annexed to the Code set out the minimum requirements to be maintained by the Distribution Licensees in their forms and formats. The Distribution Licensee may make suitable amendments in the forms/formats maintaining the minimum information and may include such provisions which are not inconsistent with the Act and the Regulations after seeking prior approval of the Commission. Such amended forms/ formats would be posted on the website of the respective Distribution Licensees for use by Consumers only after prior approval of the Commission.

b. with no undisputed sums payable to the Distribution Licensee under Section 56 of the Act

may, at the option of such Consumer, deposit security under this Regulation 13, by way of cash, irrevocable letter of credit or unconditional bank guarantee issued by a scheduled commercial bank.

13.11 The Distribution Licensee shall pay interest on the amount of security deposited in cash (including payments made through NEFT/RTGS, cheque and demand draft) by the Consumer at a rate equivalent to the Bank Rate of the Reserve Bank of India:

Provided that such interest shall be paid where the amount of security deposited in cash under this Regulation 13 is equal to or more than Rupees Fifty.

13.12 Interest on cash security deposit shall be payable from the date of deposit by the Consumer till the date of dispatch of the refund by the Distribution Licensee.

14. Classification and Reclassification of Consumers into Tariff Categories

The Distribution Licensee may classify or reclassify a Consumer into various Commission's approved tariff categories based on the purpose of usage of supply by such Consumer:

Provided that the Distribution Licensee shall not create any tariff category other than those approved by the Commission.

15. Meters

15.1 Requirement of Meters

15.1.1. All connections shall be released with an appropriate meter. All meters shall conform to requirements as laid down by various Regulations issued by Central Electricity Authority (Installation & Operation of Meters) Regulations, 2006 and as amended from time to time. The Distribution Licensee shall also comply with these Regulations for energizing a new connection or for replacement of meter or for other purposes such as energy audit and interface meter:

Provided that all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading:

Provided further that all the existing meters whenever replaced shall be replaced only by Smart Meter or Meter having at least the facility of remote reading.

रजिस्ट्री सं. डी.एल.- 33004/99 REGD. No. D. L.-33004/99

भारत का राजपत्र
The Gazette of India

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असाधारण
EXTRAORDINARY

भाग I—खण्ड 1
PART I—Section 1

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 230] नई दिल्ली, बृहस्पतिवार, अगस्त 19, 2021/श्रावण 28, 1943
No. 230] NEW DELHI, THURSDAY, AUGUST 19, 2021/SRAVANA 28, 1943

विद्युत मंत्रालय

अधिसूचना

नई दिल्ली, 17 अगस्त, 2021

फा.सं. 23/35/2019-आरएण्डआर.—विद्युत अधिनियम, 2003 की धारा 177 की उप धारा (2) के खंड (ग) के साथ पठित धारा 55 की उप धारा (1) के अंतर्गत बनाए गए केंद्रीय विद्युत प्राधिकरण (मीटरों का अधिष्ठापन और प्रचालन) (संशोधन) विनियम, 2019 के खंड 4(1)(ख) के प्रावधानों के अनुसरण में, केंद्र सरकार एतदद्वारा मौजूदा मीटरों को पूर्व भुगतान सुविधा वाले स्मार्ट मीटरों से प्रतिस्थापित करने के लिए निम्नलिखित समय-सीमा अधिसूचित करती है:

1. संचार नेटवर्क युक्त क्षेत्रों के सभी उपभोक्ताओं (कृषि उपभोक्ताओं को छोड़कर) को, नीचे विनिर्दिष्ट समय-सीमा के भीतर, पूर्व भुगतान मोड में कार्य कर रहे स्मार्ट मीटरों से विद्युत की आपूर्ति, प्रासंगिक आईएस के अनुरूप, की जाएगी:

   (i) सभी संघ राज्य क्षेत्रों, वित्तीय वर्ष 2019-20 में 15% से अधिक एटी एंड सी हानियों के साथ शहरी क्षेत्रों में 50% अधिक से उपभोक्ता वाले विद्युत मंडलों, वित्तीय वर्ष 2019-20 में 25% से अधिक एटी एंड सी हानियों वाले अन्य विद्युत मंडलों, ब्लॉक स्तर या उससे ऊपर के सभी सरकारी कार्यालयों और सभी औद्योगिक तथा वाणिज्यिक उपभोक्ताओं को दिसंबर, 2023 तक पूर्व भुगतान मोड वाले स्मार्ट मीटरों से मीटरीकृत किया जाएगा:

परंतु कि राज्य विनियामक आयोग, अधिसूचना के माध्यम से, उस अधिसूचना में यथा विनिर्दिष्टित उपभोक्ताओं के एक वर्ग या वर्गों के लिए या ऐसे क्षेत्रों के लिए कारण बताते हुए, कार्यान्वयन की उक्त अवधि को केवल दो बार, लेकिन एक बार में छह माह से अधिक बढ़ाया नहीं बढ़ा सकेगा।

(ii) अन्य सभी क्षेत्रों को मार्च, 2025 तक पूर्व भुगतान मोड वाले स्मार्ट मीटरों से मीटरीकृत किया जाएगा:

परंतु कि ऐसे क्षेत्रों में जहां संचार नेटवर्क उपलब्ध नहीं हैं, संबंधित राज्य विद्युत विनियामक आयोग द्वारा, प्रासंगिक आईएस के अनुरूप, पूर्व भुगतान मीटरों के अधिष्ठापन की अनुमति दी जा सकेगी:

(iii) सभी उपभोक्ता कनेक्शनों, जिनकी वर्तमान वहन क्षमता प्रासंगिक आई एस में विनिर्दिष्ट क्षमता से अधिक है, को ऐसे मीटर उपलब्ध कराए जाएंगे जो एएमआर सुविधा युक्त स्मार्ट मीटर हैं।

2. सभी फीडरों और वितरण ट्रांस्फार्मरों (डीटीज) को नीचे विनिर्दिष्ट समय-सीमा के अनुसार एएमआर सुविधा युक्त या एएमआई के अंतर्गत शामिल मीटर उपलब्ध कराए जाएंगे:

(i) सभी फीडरों को दिसंबर, 2022 तक मीटरीकृत कर दिया जाएगा।

(ii) वित्तीय वर्ष 2019-20 में 15% से अधिक एटी एंड सी हानियों वाले शहरी क्षेत्रों में 50% से अधिक उपभोक्ता वाले विद्युत मंडलों और वित्तीय वर्ष 2019-20 में 25% से अधिक एटी एंड सी हानियों वाले सभी अन्य विद्युत मंडलों में सभी डीटीज को दिसंबर, 2023 तक मीटरीकृत किया जाएगा।

(iii) उपरोक्त (ii) में उल्लिखित क्षेत्रों के अतिरिक्त अन्य सभी डीटीज को मार्च, 2025 तक मीटरीकृत किया जाएगा।

(iv) 25 केवीए से कम क्षमता वाले डीटीज और एचवीडीएस ट्रांसफार्मरों को उपरोक्त समय-सीमा से बाहर रखा जाएगा।

3. यह अधिसूचना भारत के राजपत्र में प्रकाशित होने की तारीख से प्रभावी होगी।

घनश्याम प्रसाद, संयुक्त सचिव

MINISTRY OF POWER

NOTIFICATION

New Delhi, the 17th August, 2021

F.No. 23/35/2019-R&R.—In pursuance to the provisions made in clause 4(1) (b) of the Central Electricity Authority (Installation and Operation of Meters) (Amendment) Regulations, 2019 framed under sub-section (1) of section 55 read with clause(c) of sub-section (2) of section 177 of the Electricity Act, 2003, the Central Government hereby notifies the following timelines for the replacement of existing meters with smart meters with prepayment feature:

1. All consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with Smart Meters working in prepayment mode, conforming to relevant IS, within the timelines specified below:

(i) All Union Territories, electrical divisions having more than 50% consumers in urban areas with AT&C losses more than 15% in financial year 2019-20, other electrical divisions with AT&C losses more than 25% in financial year 2019-20, all Government offices at Block level and above, and all industrial and commercial consumers, shall be metered with smart meters with prepayment mode by December, 2023:

Provided that the State Regulatory Commission may, by notification, extend the said period of implementation, giving reasons to do so, only twice but not more than six months at a time, for a class or classes of consumers or for such areas as may be specified in that notification;

(ii) All other areas shall be metered with smart meters with prepayment mode by March, 2025:

Provided that in areas which do not have communication network, installation of prepayment meters, conforming to relevant IS, may be allowed by the respective State Electricity Regulatory Commission:

(iii) All consumer connections having current carrying capacity beyond that specified in relevant IS, may be provided with meters with smart meters having AMR facility.

2. All feeders and distribution transformers (DTs) shall be provided with meters having AMR facility or covered under AMI, as per the timelines specified below:

(i) All feeders shall be metered by December, 2022.

(ii) All DTs in electrical divisions having more than 50% consumers in urban areas with AT&C losses more than 15% in financial year 2019-20, and in all other electrical divisions with AT&C losses more than 25% in financial year 2019-20, shall be metered by December, 2023.

(iii) All DTs in areas other than those mentioned in (ii) above, shall be metered by March, 2025.

(iv) DTs and HVDS transformers having capacity less than 25 kVA may be excluded from the above timelines.

3. This notification shall be effective from the date of publishing in the Gazette of India.

GHANSHYAM PRASAD, Jt. Secy.

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				Annexure-D
Sr. No.	**Particulars**	**Unit Cost Gross (in Rs)**	**Qty (in Nos.)**	**Cost (in Rs.)**
A	**B**	**C**	**D**	**E = C X D**
1	Single Phase Smart meters with installation, communication & integration-Consumer Meter	11011.83	901212	9923993337.96
2	Poly Phase Smart meters with installation, communication & integration-Consumer Meter	16441.31	168419	2769028988.89
3	Poly Phase HT current Smart Meter -Consumer Meter	40499.49	206	8342894.94
4	Three phase LT-CT operated Smart Meter (inclusive of 97 nos. existing Solar/Net Consumer Meters)-	20249.63	6053	122571010.39
5	LVCTO Smart Meters installation,communication & integration-DT Meter	20249.63	3398	68808242.74
6	CTPTO Smart Meters installation, communication & integration-Feeder Meter	40499.49	1255	50826859.95
7	CTPTO Smart DT Meters installation, communication & integration-ABT Meter	104141.49	133	13850818.17
	TOTAL PART-A	-		**12957422153.04**
8	Supply and installation of Meter Boxes for DT check m	2012.37	3398	6838033.26
9	Supply and installation of LT Compact CTs of LT CT Meters (3 CTs)	2515.37	6053	15225534.61
10	Supply and installation of LT CTs for DT metering (Ring Type)	2515.37	5610	14111225.70
	TOTAL PART-B			**36174793.57**
11	Architecture Specialists	251552.40	12	3018628.80
12	Security Specialists	226394.46	12	2716733.52
13	Integration Specialists	226394.46	12	2716733.52
14	Data Base Developer- Sr.	176084.32	24	4226023.68
15	Web/ Mobile Application Developer- Sr.	176084.32	24	4226023.68
16	Core Application Developer- Sr.	201239.56	24	4829749.44
17	Data Base Developer- Jr.	150929.08	36	5433446.88
18	Web/ Mobile Application Developer- Jr.	150929.08	36	5433446.88
19	Core Application Developer- Jr.	150929.08	36	5433446.88
	TOTAL PART-C			**38034233.28**
	GRAND TOTAL -PART (A+B+C)			**13031631179.89**
	GRAND TOTAL (Rs. in Crore)			**1303.16**

(Published in the Gazette of India, Extraordinary, Part III, section iv)

Central Electricity Authority

New Delhi, dated the 17th March, 2006

NOTIFICATION

No. 502/70/CEA/DP&D In exercise of the powers conferred by sub-section (1) of section 55 and clause (e) of section 73 read with sub-section (2) of section 177 of Electricity Act, 2003, the Central Electricity Authority hereby makes the following regulations for regulating the installation and operation of meters, namely :-

1. Short title and commencement. -

(1) These regulations may be called the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006.

(2) These Regulations shall come into force on the date of their publication in the Gazette of India.

2. Definitions. -

(1) In these regulations, unless the context other wise requires, -

(a) 'Act' means the Electricity Act, 2003;
(b) 'Accredited Test Laboratory' means a test laboratory accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL);
(c) 'Active Energy' means the electricity supplied or consumed during a time interval, being the integral of Active Power with respect to time, measured in the units of 'Watt – hours' or standard multiples thereof. One 'kilowatt – hour' (kWh) is one unit;
(d) 'Active Power' means the electrical power, being the product of root mean square (rms) voltage, root mean square (rms) current and cosine of the phase angle between the voltage and current vectors and measured in units of 'Watt' (W) or in standard multiples thereof;
(e) 'Appropriate Load Despatch Centre' means 'National Load Despatch Centre' (NLDC) or 'Regional Load Despatch Centre' (RLDC) or the 'State Load Despatch Centre' (SLDC) as the case may be;
(f) 'Appropriate Transmission Utility' means the 'Central Transmission Utility' (CTU) or the 'State Transmission Utility' (STU), as the case may be;
(g) 'Availability Based Tariff (ABT)' means a tariff structure based on availability of generating units and having components, viz, Capacity Charges (CC),

Energy Charges (EC) or Variable Charges (VC) and charges for Unscheduled Interchange (UI);

(h) 'Buyer' means any generating company or licensee or consumer whose system receives electricity from the system of generating company or licensee;

(i) 'Check Meter' means a meter, which shall be connected to the same core of the Current Transformer (CT) and Voltage Transformer (VT) to which main meter is connected and shall be used for accounting and billing of electricity in case of failure of main meter;

(j) 'Consumer Meter' means a meter used for accounting and billing of electricity supplied to the consumer but excluding those consumers covered under Interface Meters;

(k) 'Correct Meter' means a meter, which shall at least have, features, Accuracy Class and specifications as per the Standards on Installation and Operation of Meters given in Schedule of these Regulations;

(l) 'Energy Accounting and Audit Meters' means meters used for accounting of the electricity to various segments of electrical system so as to carry out further analysis to determine the consumption and loss of energy therein over a specified time period;

(m) 'Instrument Transformer' means the 'Current Transformer' (CT), 'Voltage Transformer' (VT) and 'Capacitor Voltage Transformer' (CVT);

(n) 'Interface Meter' means a meter used for accounting and billing of electricity, connected at the point of interconnection between electrical systems of generating company, licensee and consumers, directly connected to the Inter-State Transmission System or Intra-State_Transmission System who have to be covered under ABT and have been permitted open access by the Appropriate Commission;

(o) 'Main Meter' means a meter, which would primarily be used for accounting and billing of electricity;

(p) 'Meter' means a device suitable for measuring, indicating and recording consumption of electricity or any other quantity related with electrical system and shall include, wherever applicable, other equipment such as Current Transformer (CT), Voltage Transformer (VT) or Capacitor Voltage Transformer (CVT) necessary for such purpose;

(q) 'Power Factor' means the cosine of the electrical angle between the voltage and current vectors in an AC electrical circuit;

(r) 'Prepaid Meter' means a meter which facilitates use of electricity only after advance payment;

(s) 'Reactive Energy' means, the integral of Reactive Power with respect to time and measured in the units of 'Volt-Ampere hours reactive (VARh) or in standard multiples thereof;

(t) 'Reactive Power' means the product of root mean square (rms) voltage, root mean square (rms) current and the sine of the electrical phase angle between the voltage complexor and current complexor, measured in 'Volt – ampere reactive' (VAr) and in standard multiples thereof;

(u) 'Standards' means 'Standards on Installation and Operation of Meters' given in the Schedule of these Regulations unless otherwise any other standard specifically referred;

(v) 'Standby Meter' means a meter connected to CT and VT, other than those used for main meter and check meter and shall be used for accounting and billing of electricity in case of failure of both main meter and check meter;

(w) 'Supplier' means any generating company or licensee from whose system electricity flows into the system of another generating company or licensee or consumer;

(x) 'Time of the Day (TOD) Meter' means a meter suitable for recording and indicating consumption of electricity during specified time periods of the day.

(2) The words and expressions used and not defined in these Regulations but defined in the Act shall have the meaning assigned to them in the Act.

3. Applicability of regulations. -

(1) These Regulations shall be applicable to meters installed and to be installed by all the generating companies and licensees who are engaged in the business of generation, transmission, trading, distribution, supply of electricity and to all categories of consumers.

(2) After coming into force of these regulations, the provisions of the Indian Electricity Rules, 1956 relating to installation and operation of meters in this regard shall not be applicable.

(3) These regulations provide for type, standards, ownership, location, accuracy class, installation, operation, testing and maintenance, access, sealing, safety, meter reading and recording, meter failure or discrepancies, anti tampering features, quality assurance, calibration and periodical testing of meters, additional meters and adoption of new technologies in respect of following meters for correct accounting, billing and audit of electricity:

(i) Interface meter
(ii) Consumer meter
(iii) Energy accounting and audit Meter

4. Type of meters. -

(1) All interface meters, consumer meters and energy accounting and audit meters shall be of static type.

(2) The meters not complying with these regulations shall be replaced by the licensee on his own or on request of the consumer. The meters may also be replaced as per the regulations or directions of the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government.

5. Standards. -

All interface meters, consumer meters and energy accounting and audit meters shall –

(a) comply with the relevant standards of Bureau of Indian Standards (BIS). If BIS Standards are not available for a particular equipment or material, the relevant British Standards (BS), International Electro-technical Commission (IEC) Standards, or any other equivalent Standard shall be followed:

Provided that whenever an international Standard or IEC Standard is followed, necessary corrections or modifications shall be made for nominal system frequency, nominal system voltage, ambient temperature, humidity and other conditions prevailing in India before actual adoption of the said Standard;

(b) conform to the standards on 'Installation and Operation of Meters' as specified in Schedule annexed to these regulations and as amended from time to time.

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6. Ownership of meters. -

(1) **Interface meters**

(a) All interface meters installed at the points of interconnection with Inter-State Transmission System (ISTS) for the purpose of electricity accounting and billing shall be owned by CTU.

(b) All interface meters installed at the points of interconnection with Intra-State Transmission System excluding the system covered under sub-clause (a) above for the purpose of electricity accounting and billing shall be owned by STU.

(c) All interface meters installed at the points of inter connection between the two licensees excluding those covered under sub-clauses (a) and (b) above for the purpose of electricity accounting and billing shall be owned by respective licensee of each end.

(d) All interface meters installed at the points of inter connection for the purpose of electricity accounting and billing not covered under sub-clauses (a), (b) and (c) above shall be owned by supplier of electricity.

(2) **Consumer meters**

(a) Consumer meters shall generally be owned by the licensee.

(b) If any consumer elects to purchase a meter, the same may be purchased by him. Meter purchased by the consumer shall be tested, installed and sealed by the licensee. The consumer shall claim the meter purchased by him as his asset only after it is permanently removed from the system of the licensee.

(c) All consumer meters shall bear BIS mark, meet the requirements of these regulations and have additional features as approved by the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government. To facilitate this, the licensee shall provide a list of makes and models of the meters.

(3) **Energy accounting and audit meters**

Energy accounting and audit meters shall be owned by the generating company or licensee, as the case may be.

7. Locations of meters.-

(1) The location of interface meters, consumer meters and energy accounting and audit meters shall be as per the Table given below :

Provided that the generating companies or licensees may install meters at additional locations in their systems depending upon the requirement.

Table

Sl. No	Stages	Main meter	Check meter	Standby meter
A.	**Generating Station**	On all outgoing feeders.	On all outgoing feeders.	(i) High Voltage (HV) side of Generator Transformers (ii) High Voltage (HV) side of all Station Auxiliary Transformers
Explanation: The location of main, check and standby meters installed at the existing generating stations shall not be changed unless permitted by the Authority.				
B.	**Transmission and Distribution System**	At one end of the line between the sub-stations of the same licensee, and at both ends of the line between sub-stations of two different licensees. Meters at both ends shall be considered as main meters for respective	-	There shall be no separate standby meter. Meter installed at other end of the line in case of two different licensees shall work as standby meter.

		licensees.		
C.	**Inter-Connecting Transformer (ICT)**	High Voltage (HV) side of ICT.	-	Low Voltage (LV) side of ICT.
D.	**Consumer directly connected to the Inter-State Transmission System or Intra-State Transmission System who have to be covered under ABT and have been permitted open access by the Appropriate Commission or Any other system not covered above**	As decided by the Appropriate Commission.		

(a) **Interface Meters**

(i) Consumers who have interconnection with the Inter-State Transmission System or Intra-State Transmission System and have been permitted open access by the Appropriate Commission shall be provided with interface meters.

(ii) For consumers connected to distribution system and permitted open acess, provision of interface meters may be made as per the regulations or directions of the Appropriate Commission.

(iii) The scheme for location of interface meters shall be submitted to the CTU or the STU or the CTU or the STU or the licensee by owner of the meter in advance, before the installation of the scheme.

(b) **Consumer meters**

(i) The consumer meter shall be installed by the licensee either at consumer premises or outside the consumer premises:

Provided that where the licensee installs the meter outside the premises of the consumer, then the licensee shall provide real time display unit at the consumer premises for his information to indicate the electricity consumed by the consumer:

Provided further that for the billing purpose, reading of consumer meter and not the display unit shall be taken into account.

(ii) In the event the Appropriate Commission allows supply of electricity directly from a generating company to consumer on a dedicated transmission system, the location of the meter will be as per their mutual agreement.

(c) **Energy accounting and audit meters**

Energy accounting and audit meters shall be installed at such locations so as to facilitate to account for the energy generated, transmitted, distributed and consumed in the various segments of the power system and the energy loss. The location of these meters shall be as under:

(i)Generating Stations

(1) at the stator terminal of the generator;
(2) on HV and LV sides of the station and the unit auxiliary transformers;
(3) on feeders to various auxiliaries.

(ii)Transmission System

All incoming and out going feeders (If the interface meters do not exist).

(iii)Distribution System

(1) all incoming feeders (11 kV and above);
(2) all outgoing feeders (11 kV and above);
(3) Sub-Station Transformer including Distribution Transformer – Licensee may provide the meter on primary or secondary side or both sides depending upon the requirement for energy accounting and audit.

8. Accuracy Class of meters. -

Every meter shall meet the requirement of accuracy class as specified in the standards given in the Schedule.

9. Installation of meters. -

(1) Generating company or licensee, as the case may be, shall examine, test and regulate all meters before installation and only correct meters shall be installed.

(2) The meter shall be installed at locations, which are easily accessible for installation, testing, commissioning, reading, recording and maintenance. The place of installation of meter shall be such that minimum inconvenience and disruptions are caused to the site owners and the concerned organizations.

(3) In case of single phase meters, the consumer shall ensure that there is no common neutral or phase or looping of neutral or phase of two or more consumers on consumers' side wiring. If such common neutral or phase or looping of neutral or phase comes to the notice of the licensee, it shall suitably inform the consumer through installation report or regular electricity bills or meter test report as applicable.

(4) Consumer shall install the Earth Leakage Protective Device (ELPD) in accordance with the provisions of the rules or regulations in this regard.

(5) If the earth leakage indication is displayed in the meter the licensees shall suitably inform the consumer through installation report or regular electricity bills or meter test report as applicable.

(6) In case CTs and VTs form part of the meters, the meter shall be installed as near the instrument transformers as possible to reduce the potential drop in the secondary leads.

10. Operation, Testing and Maintenance of meters. -

The operation, testing and maintenance of all types of meters shall be carried out by the generating company or the licensee, as the case may be.

11. Access to meter. -

The owner of the premises where, the meter is installed shall provide access to the authorized representative(s) of the licensee for installation, testing, commissioning, reading and recording and maintenance of meters.

12. Sealing of meters. -

(1) Sealing Arrangements

(a) All meters shall be sealed by the manufacturer at its works. In addition to the seal provided by the manufacturer at its works, the sealing of all meters shall be done as follows at various sealing points as per the standards given in the Schedule:

(i) Sealing of interface meters, shall also be done by both the supplier and the buyer.
(ii) Sealing of consumer meters shall be done by the licensee.
(iii) Sealing of energy accounting and audit meters shall be done by the licensee or generating company as the case may be.

(b) A tracking and recording software for all new seals shall be provided by the manufacturer of the meter so as to track total movement of seals starting from manufacturing, procurement, storage, record keeping, installation, series of inspections, removal and disposal.

(c) Seal shall be unique for each utility and name or logo of the utility shall be clearly visible on the seals.

(d) Only the patented seals (seal from the manufacturer who has official right to manufacture the seal) shall be used.

(e) Polycarbonate or acrylic seals or plastic seals or holographic seals or any other superior seal shall be used.

(f) Lead seals shall not be used in the new meters. Old lead seals shall be replaced by new seals in a phased manner and the time frame of the same shall be submitted by the licensee to the Appropriate Commission for approval.

(2) Removal of seals from meters

(a) Interface meters

Whenever seals of the interface meters have to be removed for any reason, advance notice shall be given to other party for witnessing the removal of seals and resealing of the interface meter. The breaking and re-sealing of the meters shall be recorded by the party, who carried out the work, in the meter register, mentioning the date of removal and resealing, serial numbers of the broken and new seals and the reason for removal of seals.

(b) Consumer meters

Seal of the consumer meter shall be removed only by the licensee. No consumer shall tamper with, break or remove the seal under any circumstances. Any tampering, breaking or removing the seal from the meter shall be dealt with as per relevant provisions of the Act.

(c) Energy accounting and audit meters

Seal of the energy accounting and audit meter shall be removed only by the generating company or the licensee who owns the meter.

13. Safety of meters. -

(1) The supplier or buyer in whose premises the interface meters are installed shall be responsible for their safety.

(2) The consumer shall, as far as circumstances permit, take precautions for the safety of the consumer meter installed in his premises belonging to the licensee.

(3) Licensee shall be responsible for the safety of the consumer meter located outside the premises of the consumer and the consumer shall be responsible for the safety of the real time display unit installed by the licensee in consumer premises.

(4) The generating company or the licensee who owns the energy accounting and audit meters shall be responsible for its safety.

14. Meter reading and recording. -

(1) **Interface meters**

It shall be the responsibility of the Appropriate Transmission Utility or the licensee to take down the meter reading and record the metered data, maintain database of all the information associated with the interface meters and verify the correctness of metered data and furnish the same to various agencies as per the procedure laid down by the Appropriate Commission.

(2) **Consumer meters**

(a) It shall be the responsibility of the licensee to record the metered data, maintain database of all the information associated with the consumer meters and verify the correctness of metered data.

(b) The licensee shall maintain accounts for the electricity consumption and other electrical quantities of its consumers.

(c) Brief history, date of installation and details of testing, calibration and replacement of meters shall be maintained by the licensee.

(3) **Energy accounting and audit meters**

It shall be the responsibility of the generating company or licensee to record the metered data, maintain database of all the information associated with the energy accounting and audit meters and verify the correctness of metered data. Each generating company or licensee shall prepare quarterly, half-yearly and yearly energy account for its system for taking appropriate action for efficient operation and system development.

15. Meter failure or discrepancies. -

(1) **Interface meters**

(a) Whenever difference between the readings of the Main meter and the Check meter for any month is more than 0.5%, the following steps shall be taken:

(i) checking of CT and VT connections;
(ii) testing of accuracy of interface meter at site with reference standard meter of accuracy class higher than the meter under test.

If the difference exists even after such checking or testing, then the defective meter shall be replaced with a correct meter.

(b) In case of conspicuous failures like burning of meter and erratic display of metered parameters and when the error found in testing of meter is beyond the permissible limit of error provided in the relevant standard, the meter shall be immediately replaced with a correct meter.

(c) In case where both the Main meter and Check meter fail, at least one of the meters shall be immediately replaced by a correct meter.

(d) Billing for the Failure period:

(i) The billing for the failure period of the meter shall be done as per the procedure laid down by the Appropriate Commission.

(ii) Readings recorded by Main, Check and Standby meters for every time slot shall be analysed, crosschecked and validated by the Appropriate Load Despatch Centre (LDC). The discrepancies, if any, noticed in the readings shall be informed by the LDC in writing to the energy accounting agency for proper accounting of energy. LDC shall also intimate the discrepancies to the Appropriate Transmission Utility or the licensee, who shall take further necessary action regarding testing, calibration or replacement of the faulty meters in accordance with the provisions laid down.

(e) The defective meter shall be immediately tested and calibrated

(2) **Consumer meters**

In case the consumer reports to the licensee about consumer meter readings not commensurate with his consumption of electricity, stoppage of meter, damage to the seal, burning or damage of the meter, the licensee shall take necessary steps as per the procedures given in the Electricity Supply Code of the Appropriate Commission read with the notified conditions of supply of electricity.

(3) **Energy accounting and audit meters**

Energy accounting and audit meters shall be rectified or replaced by the generating company or licensee immediately after notice of any of the following abnormalities:

(a) the errors in the meter readings are outside the limits prescribed for the specified Accuracy Class;
(b) meter readings are not in accordance with the normal pattern of the load demand;
(c) meter tampering, or erratic display or damage.

16. Anti-tampering features of meters. -

The meters shall be provided with such anti-tampering features as per the Standards on Installation and Operation of Meters given in the Schedule.

17. Quality assurance of meters. -

(1) The distribution licensee shall put in place a system of quality assurance and testing of meters with the approval of Appropriate Commission.

(2) The licensee shall set up appropriate number of accredited testing laboratories or utilize the services of other accredited testing laboratories. The licensee shall take immediate action to get the accreditations of their existing meter testing laboratories from NABL, if not already done.

(3) The generating company or licensee shall ensure that all type, routine and acceptance tests are carried out by the manufacturer complying with the requirement of the relevant IS or BS or IEC as the case may be.

18. Calibration and periodical testing of meters. –

(1) **Interface meter**

(a) At the time of commissioning, each interface meter shall be tested by the owner at site for accuracy using standard reference meter of better accuracy class than the meter under test.

(b) All interface meters shall be tested at least once in five years. These meters shall also be tested whenever the energy and other quantities recorded by the meter are abnormal or inconsistent with electrically adjacent meters. Whenever there is unreasonable difference between the quantity recorded by interface meter and the corresponding value monitored at the billing center via communication network, the communication system and terminal equipment shall be tested and rectified. The meters may be tested using NABL accredited mobile laboratory or at any accredited laboratory and recalibrated if required at manufacturer’s works.

(c) Testing and calibration of interface meters may be carried out in the presence of the representatives of the supplier and buyer. The owner of the meter shall send advance notice to the other party regarding the date of testing.

(2) **Consumer meters**

The testing of consumer meters shall be done at site at least once in five years. The licensee may instead of testing the meter at site can remove the meter and replace the same by a tested meter duly tested in an accredited test laboratory. In addition, meters installed in the circuit shall be tested if study of consumption pattern changes drastically from the similar months or season of the previous years or if there is consumer's complaint pertaining to a meter. The standard reference meter of better accuracy class than the meter under test shall be used for site testing of consumer meters up to 650 volts. The testing for consumers meters above 650 volts should cover the entire metering system including CTs, VTs. Testing may be carried out through NABL accredited mobile laboratory using secondary injection kit, measuring unit and phantom loading or at any accredited test laboratory and recalibrated if required at manufacturer's works.

(3) **Energy accounting and audit meters**

Energy accounting and audit meters shall be tested at site at least once in five years or whenever the accuracy is suspected or whenever the readings are inconsistent with the readings of other meters, e.g., check meters, standby meters. The testing must be carried out without removing the CTs and VTs connection. Testing may be carried out through NABL accredited mobile laboratory using secondary injection kit, measuring unit and phantom loading or at any accredited test laboratory and recalibrated if required at manufacturer's works.

19. Additional meters. -

In addition to any meter which may be placed for recording the electricity consumed by the consumer, the licensee may connect additional meters, maximum demand indicator or other apparatus as he may think fit for the purposes of ascertaining or regulating either the quantity of electricity supplied to the consumer, or the number of hours during which the supply is given, or the rate per unit of time at which energy is supplied to the consumer, or any other quantity or time connected with the supply to consumer:

Provided that the meter, indicator or apparatus shall not, in the absence of an agreement to the contrary, be placed otherwise than between the distributing mains of the licensee and any meter:

Provided further that, where the charges for the supply of energy depend wholly or partly upon the reading or indication of any such meter, indicator or apparatus as aforesaid, the licensee shall, in the absence of an agreement to the contrary, keep the meter, indicator or apparatus correct.

20. Adoption of new technologies. -

The distribution licensee shall make out a plan for introduction and adoption of new technologies such as pre-paid meters, time of the day meters (TOD), automatic remote meter reading system through appropriate communication system with the approval of the Appropriate Commission or as per the regulations or directions of the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government.

SCHEDULE

(see regulations 2,5,8,12 and 16)

Standards on Installation and Operation of Meters

Part I Standards Common To All Type of Meters

(1) These standards provide for specification of meters, immunity to external factors, sealing points and functional requirements that are required from regulatory perspective. Detailed technical specification shall be prepared by the purchaser of the meter.

(2) **Specifications of meters**

<table>
<tr><td>Standard Reference Voltage</td><td>As per IS</td></tr>
<tr><td>Voltage Range</td><td>As per IS</td></tr>
<tr><td>Standard Frequency</td><td>As per IS</td></tr>
<tr><td>Standard Basic Current</td><td>As per IS

(Current range of consumer meters shall be so chosen as to record the load current corresponding to the sanctioned load)</td></tr>
<tr><td>Accuracy Class</td><td>Meters shall meet the following requirements of Accuracy Class:
<table>
<tr><td>Interface meters</td><td>0.2S</td></tr>
<tr><td colspan="2">Consumer meters</td></tr>
<tr><td>Up to 650 volts</td><td>1.0 or better</td></tr>
<tr><td>Above 650 volts and up to 33 kilo volts</td><td>0.5S or better</td></tr>
<tr><td>Above 33 kilo volts</td><td>0.2S</td></tr>
<tr><td colspan="2">Energy accounting and audit meters

The accuracy class of meters in generation and transmission system shall not be inferior to that of 0.2S Accuracy Class. The accuracy class of meters in distribution system shall not be inferior to that of 0.5S Accuracy Class</td></tr>
</table></td></tr>
<tr><td>Starting Current and Maximum Current</td><td>As per IS</td></tr>
</table>

Power Factor Range	As per IS
Power Frequency Withstand Voltage	As per IS
Impulse Voltage Withstand Test for 1.2/50 micro sec	As per IS
Power Consumption	As per IS

(3) Meter shall have downloading facilities of metered data through Meter Reading Instrument (MRI).

(4) **Immunity to External Factors**

The meter shall be immune to external influences like magnetic induction, vibration, electrostatic discharge, switching transients, surge voltages, oblique suspension and harmonics and necessary tests shall be carried out in accordance with relevant standard.

(5) **Sealing Points**

Sealing shall be done at the following points (as applicable):

(a) Meter body or cover

(b) Meter terminal cover

(c) Meter test terminal block

(d) Meter cabinet

(6) The accuracy class of Current transformers (CTs) and Voltage transformers (VTs) shall not be inferior to that of associated meters. The existing CTs and VTs not complying with these regulations shall be replaced by new CTs and VTs, if found defective, non-functional or as per the directions of the Appropriate Commission. In case the CTs and VTs of the same Accuracy Class as that of meters can not be accommodated in the metering cubicle or panel due to space constraints, the CTs and VTs of the next lower Accuracy Class can be installed.

(7) The Voltage Transformers shall be electromagnetic VT or Capacitive Voltage Transformer (CVT).

Part II Standards for interface meters

(1) **Functional Requirements:**

(a) The Interface meters suitable for ABT shall be static type, composite meters , as self –contained devices for measurement of active and reactive energy, and certain other parameters as described in the following paragraphs. The meters shall be suitable for being connected directly to voltage transformers (VTs) having a rated secondary line-to-line voltage of 110 V, and to current transformers (CTs) having a rated secondary current of IA (Model-A :3 element 4 wire or Model C: 2 element , 3 wire) or 5A (model-B: 3 element , 4 wire or Model D: 2 element 3 wire). The reference frequency shall be 50Hz.

(b) The meters shall have a non-volatile memory in which the following shall be automatically stored:

(i) Average frequency for each successive 15-minute block, as a two digit code (00 to 99 for frequency from 49.0 to 51.0Hz).
(ii) Net Wh transmittal during each successive 15-minute block, upto second decimal, with plus/minus sign.
(iii) Cumulative Wh transmittal at each midnight, in six digits including one decimal.
(iv) Cumulative VArh transmittal for voltage high condition, at each midnight, in six digits including one decimal.
(v) Cumulative VArh transmittal for voltage low condition, at each midnight, in six digits including one decimal.
(vi) Date and time blocks of failure of VT supply on any phase, as a star(*) mark.

(c) The meters shall store all the above listed data in their memories for a period of at least ten days. The data older than ten days shall get erased automatically. Each meter shall have an optical port on its front for tapping all data stored in its memory using a hand held data collection device. The meter shall be suitable for transmitting the data to remote location using appropriate communication medium.

(d) The active energy (Wh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy as per class 0.2 S of IEC-687/IEC-62053-22. In model-A and C, the energy shall be computed directly in CT and VT secondary quantities, and indicated in watt-hours. In model-B and Model D , the energy display and recording shall be one fifth of the Wh computed in CT and VT secondary quantities.

(e) The Var and reactive energy measurement shall also be on 3-phase, 4-wire principle, with an accuracy as per class 2 of IEC-62053-23 or better. In model-A or Model C, the Var and VArh computation shall be directly in CT and VT secondary quantities. In model-B or Model D, the above quantities shall be displayed and recorded as one-fifth of those computed in CT and VT secondary quantities. There shall be two reactive energy registers, one for the period when average RMS voltage is above 103% and the other for the period the voltage is below 97%.

(f) The 15-minute Wh shall have a +ve sign when there is a net Wh export from substation busbars, and a –ve sign when there is a net Wh import. The integrating (cumulative) registers for Wh and Varh shall move forward when there is Wh/Varh export from substation busbars, and backward when there is an import.

(g) The meters shall also display (on demand), by turn, the following parameters :

(i) Unique identification number of the meter
(ii) Date
(iii) Time
(iv) Cumulative Wh register reading
(v) Average frequency of the previous 15-minute block
(vi) Net Wh transmittal in the previous 15-minute block, with +/-sign
(vii) Average percentage voltage
(viii) Reactive power with +/- sign
(ix) Voltage-high VArh register reading
(x) Voltage-low VArh register reading.

(h) The three line-to-neutral voltages shall be continuously monitored, and in case any of these falls below 70%, the condition shall be suitably indicated and recorded. The meters shall operate with the power drawn from the VT secondary circuits, without the need for any auxiliary power supply. Each meter shall have a built-in calendar and clock, having an accuracy of 30 seconds per month or better.

(i) The meters shall be totally sealed and tamper-proof, with no possibility of any adjustment at site, except for a restricted clock correction. The harmonics shall be filtered out while measuring Wh, Var and VArh, and only fundamental frequency quantities shall be measured/computed.

(j) The Main meter and the Check meter shall be connected to same core of CTs and VTs.

Part III Standards for consumers meters

(1) **Measuring Parameters**

(a) The consumer meter shall be suitable for measurement of cumulative active energy utilized by the consumer.

(b) The consumer meter may have the facilities to measure, record and display one or more of the following parameters depending upon the tariff requirement for various categories of consumers. All parameters excluding instantaneous electrical parameters shall also be stored in memory.

(i) Cumulative reactive energy

(ii) Average power factor

(iii) Time of use of energy

(iv) Apparent power

(v) Maximum demand

(vi) Phase voltage and line currents

(2) All the three phase meters shall have data storage capacity for at least 35 days in a non-volatile memory.

(3) **Anti-Tampering Features**

(a) The meter shall not get damaged or rendered non-functional even if any phase and neutral are interchanged.

(b) The meter shall register energy even when the return path of the load current is not terminated back at the meter and in such a case the circuit shall be completed through the earth. In case of metallic bodies, the earth terminal shall be brought out and provided on the outside of the case.

(c) The meter shall work correctly irrespective of the phase sequence of supply (only for poly phase).

(d) In the case of 3 phase, 3 wire meter even if reference Y phase is removed, the meter shall continue to work. In the case of 3 phase, 4 wire system, the meter shall keep working even in the presence of any two wires i.e., even in the absence of neutral and any one phase or any two phases.

(e) In case of whole current meters and LV CT operated meter, the meter shall be capable of recording energy correctly even if input and output terminals are interchanged.

(f) The registration must occur whether input phase or neutral wires are connected properly or they are interchanged at the input terminals.

(g) The meter shall be factory calibrated and shall be sealed suitably before dispatch.

(h) The meter shall be capable of recording occurrences of a missing potential (only for VT operated meters) and its restoration with date and time of first such occurrence and last restoration along with total number and duration of such occurrences during the above period for all phases.

(i) Additional anti-tampering features including logging of tampers such as current circuit reversal, current circuit short or open and presence of abnormal magnetic field may be provided as per the regulations or directions of the Appropriate Commission or pursuant to the reforms programme of the Appropriate Government.

Part IV Standards for energy accounting and audit meters

(1)The energy accounting and audit meters shall be suitable for measurement, recording and display of cumulative active energy with date and time.

(2) The energy accounting and audit meters may also have the facility to measure, record and display one or more of the following parameters depending upon the energy accounting and audit requirement. All parameters excluding instantaneous electrical parameters shall also be stored in memory.

(a) Apparent power

(b) Phase wise kilowatt at peak KVA

(c) Phase wise KVA(reactive) at peak KVA

(d) Phase wise voltage at peak KVA

(e) Power down time

(f) Average power factor

(g) Line currents

(h) Phase voltages

(i) Date and time

(j) Tamper events

(3) The energy accounting and audit meter shall have data storage capacity for at least 35 days in a non-volatile memory.

(4) Energy accounting and audit meters shall have facility to download the parameters through meter reading instruments as well as remote transmission of data over communication network.

Sd/-

(R. Dahiya)
Secretary, Central Electricity Authority

Annexure G

Annexure A :Technical Specifications for Whole Current A.C. Single Phase Smart Energy Meter

Scope

These specifications cover the design, manufacturing, testing, supply and delivery of AC whole current, single phase, 2 wires Smart Energy Meter with bidirectional communication facility & remote connect/disconnect switch. The meter shall communicate with Head End System (HES) on any one of the communication technologies mentioned in IS16444 Part 1, as per the requirement of the Utility/AMI-IA.

Basic Features

The Smart Meter would have the following minimum basic features-

- Measurement of electrical energy parameters
- Bidirectional Communication
- Integrated Load limiting /connect/disconnect switch
- Tamper event detection, recording and reporting
- Power event alarms as per IS 16444 Part 1
- Remote firmware upgrade
- TOD features
- Net Metering(kWh) features (optional as per requirement of Utility/AMI-IA)
- On demand reading

General standards applicable for meters

S. No.	Standard No.	Title
1	IS 13779 with latest amendments	AC Static Watt-hour Meter class 1& 2
2	IS 15884 with latest amendments	Alternating Current Direct Connected Static Prepayment Meters for Active Energy (Class 1 and 2)-
3	IS 16444 Part 1 with latest amendments	A.C. Static Direct Connected Watt Hour Smart Meter Class 1 and 2- Specification
4	IS 15959 Part 1 & Part 2 with latest amendments	Data Exchange for Electricity Meter Reading, Tariff and Load Control-Companion Standards

Communication

Meter shall have the ability to communicate with Head End System (HES) on any one of the communication technologies mentioned in IS16444 Part 1 (RF Mesh/Cellular) in a secure manner. The selection of communication technology should be as per the site conditions and as per design consideration of AMI Implementing agency to meet the performance as per agreed Service Level Agreements (SLAs). In case of Cellular based meter, the meter shall accommodate SIM card/ e-SIM of any service provider. The meter shall log the removal of the plug-in type communication module removal /nonresponsive event with snapshot.

Remote connect/disconnect/load limiting: Remote Connect/disconnect/Load control facilities would be as per IS 16444 part 1.

Other Specifications

Features	Minimum Requirement of Features
Applicable Standards	The meters shall comply with IS 16444 Part 1 for all requirements.
Reference Voltage	As per relevant IS (240 V)
Current Rating	10-60 A
Category	UC1
Starting Current	As per IS 16444 Part 1
Accuracy	Class 1.0 as per IS 16444 Part 1
Limits of error	As per IS 16444 Part 1
Operating Temperature range	As per IS 13779
Humidity	As per IS 13779
Frequency	As per IS 16444 Part 1
Influence Quantities	As per IS 16444 Part 1
Power Consumption of meter	As per IS 16444 Part 1
Current and Voltage Circuit	As per IS 16444 Part 1
Running at No Load	As per IS 16444 Part 1
Test output device	As per IS 16444 Part 1
Meter Display	Backlit LCD, Scrolling, 10 seconds for each parameter minimum 7 Digits LCD display. The back lit must be green in color
Name Plate & marking Meter Display	i.Manufacturer's name ii.Type designation iii.Number of phases and wires iv.Serial number (Meter serial number shall be laser printed on name plate instead on sticker). v.Serial number along with barcode vi.Month and Year of manufacture vii.Unit of measurement viii.Reference voltage ,frequency ix.Ref. temperature x.Rated basic and maximum Current xi.Meter constant (imp/kWh) xii.'BIS' Mark

	xiii.Class index of meter xiv."Property of BEST Undertaking" xv.Purchase Order No. & date xvi.Guarantee period. xvii.Sign of double square xviii.Country of manufacture. xix.Firmware version of meter xx.Symbol of load switch. xxi.NIC serial NO (Shall be visible from Communication Module Slot) xxii.Compatibility of NIC Card.
Parameters to be measured	As per IS 16444 Part 1 / As per IS 15959 Part-2 RF/ GSM signal Strength in milli db to be available in instantaneous parameters. All energies and demand will be available TOD wise in billing/ LS parameters.
Maximum Demand resetting	As per IS 15959 Part 2
Time of Use registers	As given in the document
Power Quality Information	As per IS 15959 part 2
LED/LCD Indicators	As per IS 16444 Part 1
Load Survey/Interval Data	DIP: 30 min (Block window method) SIP: 30 min LS Days: 60
Tamper/ Event Recording	As given in the document
Measuring Elements	As per IS 16444 Part 1.
Alarm	As per IS 16444 Part 1/ 15959 Part 2

Features	Minimum Requirement of Features
Load Control	As per IS 16444 Part 1
Connect/Disconnect switch	UC1 (As per IS 16444 part 1)
Status of load switch	As per IS 16444 Part 1
Programmability	As per IS 16444 Part 1
Communication	As per IS 16444. Part 1
Data Exchange Protocol	As per IS 16444 Part 1
Remote Firmware upgrade	As per IS 15959 Part 2

Real Time Clock (RTC)	As per IS 16444 Part 1/ IS 15959 Part1 & Part 2
Data Retention	As per IS 16444 Part 1

Features	**Minimum Requirement of Features**
Battery Backup	Meter shall be supplied with separate battery backup for RTC.
First Breath (power on) and Last gasp (power off) condition detection and communication to HES	As per IS 16444 Part 1
Plug-in Communication Module	The Smart Meters shall be have a dedicated sealable slot for accommodating plug-in type bi -directional communication module which shall integrate the respective communication technology (RF Mesh/ Cellular) with the Smart Meters, leading to easy adaptability for network interfaces (WAN/NAN).The Plug-In module shall be field hot swappable/ replaceable. Same NIC shall work with different types of meters of same make (1P, 3P, LTCT, HT etc).
Optical Port	The meter shall have optical port for downloading data. Optical port shall be with a rust resistance coated metal ring to hold magnet of downloading probe. The optical head used for meter reading shall comply with IEC 62056-21 as far as physical construction is concerned. 10 Nos. of optical chords shall be provided for downloading the data from Meter to PC using BCS software in the Lab. The Optical Port provided on meter shall have flap & sealing provision.
Calibration	Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However parameters like RTC, TOD slots & timings, DIP (billing & load survey), billing date change, relay connect/Disconnect, Set load limit, Pre paid/post paid, Set metering mode (Import/Export), display setting shall be reconfigure through CMRI and remotely over the air (OTA), and any other support will be provided without any additional cost to BEST till the useful life of the meters.

Meter Dimension in MM	Is not more than 170(Height)*140(Width)*100(Depth)
Features	**Minimum Requirement of Features**
Software and communication compatibility	The bidder shall supply software required for communication though local (CMRI and BCS software) and remote (AMI) connectivity free of cost and necessary training. For existing meter manufacturer, it should be ensured that all meters (existing non-smart &upcoming smart meters) can be read through one BCS only. The list of OBIS codes for the parameters will be provided at the time of placement of PO in case of not specified in IS 15959. There shall be facility to export the data in Excel/txt/csv/PDF and XML format.
KVAH & KVA calculation	Meter shall be programed as Lag+ Lead configuration i.e. Leading PF shall not be considered as unity
Internal component specification	AS given in the document

Data display facility (auto/manual)

For single phase unidirectional meter Display1 Parameters (Auto Scroll Mode) Cumulative Forward kWh (7+0)

Display2 Parameters (Manual Scroll Mode)

Display Check

Meter Serial Number

RTC- Date (DD.MM.YY)

RTC- Time (HH:MM:SS)

Cumulative Forward kWh (7+0)

TOD 1 Forward kWh

TOD 2 Forward kWh

TOD 3 Forward kWh

TOD 4 Forward kWh

TOD 5 Forward kWh

Cumulative Forward kVArh lag (6+0)

Cumulative Forward kVArh lead (6+0)

Cumulative Forward kVAh (6+0)

TOD 1 Forward kVAh

TOD 2 Forward kVAh

TOD 3 Forward kVAh

TOD 4 Forward kVAh

TOD 5 Forward kVAh

Present Maximum Demand in Forward kW with date & time
Present Maximum Demand in Forward kVA with date & time
Instantaneous Voltage
Instantaneous Phase Current

Instantaneous Neutral Current
Instantaneous P.F
Instantaneous Active power (3+3)
Instantaneous Apparent power (3+3)
Instantaneous Reactive power (3+3) (Lag or Lead)
TOD 1 Frozen Maximum demand in Forward kW with date & time
TOD 2 Frozen Maximum demand in Forward kW with date & time
TOD 3 Frozen Maximum demand in Forward kW with date & time
TOD 4 Frozen Maximum demand in Forward kW with date & time
TOD 5 Frozen Maximum demand in Forward kW with date & time TOD 1 Frozen Maximum demand in Forward kVA with date & time
TOD 2 Frozen Maximum demand in Forward kVA with date & time
TOD 3 Frozen Maximum demand in Forward kVA with date & time TOD 4 Frozen Maximum demand in Forward kVA with date & time TOD 5 Frozen Maximum demand in Forward kVA with date & time
Frozen energy in Forward kWh for last 6 reset
Frozen energy in Forward kVAh for last 6 reset
Frozen Maximum demand in Forward kW for last 6 reset
Frozen Maximum demand in Forward kVA for last 6 reset
Rising Demand Forward kW along with time elapsed.
Cumulative Tamper Count
History of last 3 tampers occurrence & recovery
Defraud Register Cumulative kWh during Magnetic Tamper (6+0)
Defraud Register Cumulative kWh during ND Tamper (6+0)
Defraud Register Cumulative kWh during NM Tamper (6+0)
Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date &time
Latest Neutral Disturbance occurrence date & time
Latest Neutral Disturbance recovery date & time
Latest Neutral Missing occurrence date & time
Latest Neutral Missing recovery date & time
Cover Open tamper occurrence Date (If Occurred Only) Cover Open tamper occurrence Time (If Occurred Only)
Status of Load Switch
Count of Relay connect
Relay connect Date of last occurrence
Relay connect Time of last occurrence
Count of Relay disconnect
Relay disconnect Date of last occurrence
Relay disconnect Time of last occurrence
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status
NIC card status
RSSI Value

Display 3 Parameters (High Resolution Mode)

Cumulative Forward kWh (2+4)

TOD 1 Forward kWh (6+0)

TOD 2 Forward kWh (6+0)

TOD 3 Forward kWh (6+0) TOD 4
Forward kWh (6+0)

TOD 5 Forward kWh (6+0)

Cumulative Forward kVArh lag (2+4)

Cumulative Forward kVArh lead (2+4)

Cumulative Forward kVAh (2+4)

TOD 1 Forward kVAh (6+0)

TOD 2 Forward kVAh (6+0)

TOD 3 Forward kVAh (6+0)

TOD 4 Forward kVAh (6+0)

TOD 5 Forward kVAh (6+0)

Frozen Maximum demand in Forward kW for last 6 reset with date & time

Frozen Maximum demand in Forward kVA for last 6 reset with date & time

For single phase Bi-directional meter-

Display1 Parameters (Auto Scroll Mode)

Display Check

Meter Serial Number

RTC- Date (DD.MM.YY)

RTC- Time (HH:MM:SS)

Cumulative kWh (6+0) - Import

TOD 1 kWh - Import

TOD 2 kWh - Import

TOD 3 kWh - Import

TOD 4 kWh - Import

TOD 5 kWh - Import

Cumulative kVArh lag - Import

Tariff wise MD kVA Date & time - Import

Cumulative kVArh lead - Import

Cumulative kVAh - Import

TOD 1 kVAh - Import

TOD 2 kVAh - Import

TOD 3 kVAh - Import

TOD 4 kVAh - Import

TOD 5 kVAh - Import

Cumulative kWh (6+0) - Export

TOD 1 kWh - Export

TOD 2 kWh - Export

TOD 3 kWh - Export

TOD 4 kWh - Export

TOD 5 kWh - Export

Cumulative kVArh lag - Export

Tariff wise MD kVA Date & time - Export

Cumulative kVArh lead - Export

Cumulative kVAh - Export

TOD 1 kVAh - Export

TOD 2 kVAh - Export
TOD 3 kVAh - Export
TOD 4 kVAh - Export
TOD 5 kVAh - Export

Display2 Parameters (Manual Scroll Mode)
Display Check
Meter Serial Number
RTC- Date (DD.MM.YY)
RTC- Time (HH:MM:SS)
Instantaneous Voltage
Instantaneous Phase Current
Instantaneous Neutral Current
Instantaneous P.F
Instantaneous Active power (3+3)
Instantaneous Apparent power (3+3)
Instantaneous Reactive power (3+3) (Lag or Lead)
Cumulative kWh (6+0) - Import
TOD 1 kWh - Import
TOD 2 kWh - Import
TOD 3 kWh - Import
TOD 4 kWh - Import
TOD 5 kWh - Import
Cumulative kVArh lag - Import
Tariff wise MD kVA Date & time - Import
Cumulative kVArh lead - Import Cumulative kVAh - Import
TOD 1 kVAh - Import
TOD 2 kVAh - Import
TOD 3 kVAh - Import
TOD 4 kVAh - Import TOD 5 kVAh - Import
Cumulative kWh (6+0) - Export
TOD 1 kWh - Export
TOD 2 kWh - Export
TOD 3 kWh - Export
TOD 4 kWh - Export TOD 5 kWh - Export
Cumulative kVArh lag - Export
Tariff wise MD kVA Date & time - Export
Cumulative kVArh lead - Export
Cumulative kVAh - Export
TOD 1 kVAh - Export
TOD 2 kVAh - Export
TOD 3 kVAh - Export
TOD 4 kVAh - Export
TOD 5 kVAh - Export
Latest reset- Cumulative kWh (6+0) - Import

Latest reset- TOD 1 kWh - Import
Latest reset- TOD 2 kWh - Import
Latest reset- TOD 3 kWh - Import
Latest reset- TOD 4 kWh - Import
Latest reset- TOD 5 kWh - Import
Latest reset- Cumulative kVArh lag - Import
Latest reset- Tariff wise MD kVA Date & time - Import
Latest reset- Cumulative kVArh lead - Import
Latest reset- Cumulative kVAh - Import
Latest reset- TOD 1 kVAh - Import
Latest reset- TOD 2 kVAh - Import
Latest reset- TOD 3 kVAh - Import
Latest reset- TOD 4 kVAh - Import
Latest reset- TOD 5 kVAh - Import
Latest reset- Cumulative kWh (6+0) - Export
Latest reset- TOD 1 kWh - Export
Latest reset- TOD 2 kWh - Export
Latest reset- TOD 3 kWh - Export
Latest reset- TOD 4 kWh - Export
Latest reset- TOD 5 kWh - Export
Latest reset- Cumulative kVArh lag - Export
Latest reset- Tariff wise MD kVA Date & time - Export
Latest reset- Cumulative kVArh lead - Export
Latest reset- Cumulative kVAh - Export
Latest reset- TOD 1 kVAh - Export
Latest reset- TOD 2 kVAh - Export
Latest reset- TOD 3 kVAh - Export
Latest reset- TOD 4 kVAh - Export
Latest reset- TOD 5 kVAh - Export
Frozen energy in kWh for last 6 reset- Import
Frozen energy in kVAh for last 6 reset- Import
Frozen Maximum demand in kW for last 6 reset- Import Frozen Maximum demand in kVA for last 6 reset- Import
Frozen energy in kWh for last 6 reset- Export
Frozen energy in kVAh for last 6 reset- Export
Frozen Maximum demand in kW for last 6 reset- Export
Frozen Maximum demand in kVA for last 6 reset- Export Rising Demand Forward kW along with time elapsed.
Cumulative Tamper Count
History of last 3 tampers occurrence & recovery
Defraud Register Cumulative kWh during Magnetic Tamper (6+0) Defraud Register Cumulative kWh during ND Tamper (6+0)
Defraud Register Cumulative kWh during NM Tamper (6+0) Latest Magnetic tamper occurrence date & time
Latest Magnetic tamper recovery date & time
Latest Neutral Disturbance occurrence date & time
Latest Neutral Disturbance recovery date & time
Latest Neutral Missing occurrence date & time
Latest Neutral Missing recovery date & time

Cover Open tamper occurrence Date (If Occurred Only)
Cover Open tamper occurrence Time (If Occurred Only)
Status of Load Switch
Count of Relay connect
Relay connect Date of last occurrence
Relay connect Time of last occurrence
Count of Relay disconnect
Relay disconnect Date of last occurrence
Relay disconnect Time of last occurrence
Meter Version
DLMS Version
RTC Date Status
Battery Status
Non volatile memory status
NIC card status
RSSI Value

Display 3 Parameters (High Resolution Mode) Cumulative Forward kWh (2+4) - Import
Cumulative Forward kVArh lag (2+4) - Import
Cumulative Forward kVArh lead (2+4) - Import
Cumulative Forward kVAh (2+4) - Import
Cumulative Forward kWh (2+4) - Export
Cumulative Forward kVArh lag (2+4) - Export
Cumulative Forward kVArh lead (2+4) - Export
Cumulative Forward kVAh (2+4) - Export

1 TOD Feature:

The meter shall be capable of measuring Cumulative Energy (KWh), KVarh Lag, Kvarh Lead, Kvah and MD (KW, KVA)with time of day (TOD) registers having 5 zones (no. of zones & time slot shall be programmable by CMRI with adequate security level).
TOD Slot Configuration shall be as follows-

Slot	Time Slots
TOD 1	22 to 06 Hrs
TOD 2	06 to 09 Hrs
TOD 3	09 to 12 Hrs
TOD 4	12 to 18 Hrs.
TOD 5	18 to 22 Hrs

Further, the Meter should display high resolution energy values with resolution of 2 digits before decimal and 4 digits after decimal in push button mode
The meter's display should return to default display mode (continues auto scroll) if push button is not operated for more than 10 seconds. (The order of display may be revised as per requirement of the Utility/AMI-IA). Meter display should not go in to the sleep mode during Power-On condition in case the push button is not operated for more than 10 minutes.

Anti-tamper features

The meter shall continue working under tamper conditions as defined in IS 15959 Part 2 and would log the event and send alarm at Head End System after detection of the defined tamper features as given below.

1Immunity against external influencing signals:

Magnetic Field:

Meter shall record accurate energy in case of any external influencing signals in line with IS 13779:1999 Cl.11.2 and variation in limits of error (up to 100% Imax) shall be as per the table 17 of IS 13779. Meter shall be immune to magnetic field such that it shall not affect the normal overall functionality However, in case of abnormal magnetic field as defined below meter shall perform as per the following features:

a.Meter shall log the event in its memory as" MAGNET" with date and time stamp within 30 sec or immediate of application of abnormal magnetic field and shall start recording at 100% Imax and after removal of magnet, back to normal recording within 30 sec or immediate b.Meter shall show "Magnet" in the display.

Abnormal Magnetic field is defined as below;

a. Continuous DC magnetic induction: >0.27 Tesla ± 5%(Value of the magneto motive force to be applied shall be generally >10000 ATs, Should be immune up to 0.27Tesla)

b. AC magnetic induction: Immune for 10 milli Tesla (if produced with circular metal core with square cross section as specified in CBIP latest report with 2800 AT

c. Permanent Magnet: Immune up to 0.5T and Event logging >0.5T

Electrostatic Discharge (ESD)

Meter shall be immune up to 50 kV and shall record accurate energy as per IS-13779:1999.Meter shall log the event into memory as 'ESD' with date & time stamp for any ESD greater than 50 kV and shall show 'ESD' in the display.

The shielding around the meter shall be such that it does not get affected by high voltage, high and low energy impulse when comes in contact with meter from any side.

The meter should immune to high/ low frequency Jammer devices. Meter shall log event in its memory as jammer with date and time stamp along with snapshot.

The meter should be immune or log the tamper on application of any other higher magnetic field of any frequency waves, micro waves

Neutral Disturbance

The meter shall log in the memory as 'NEUTRAL DISTURBANCE' with date and time stamp and show 'ND' in the display for Frequency variation below 45 Hz and above 55 Hz with time delay of 2 min and for Pulsating DC and Chopped AC of any value with time delay of 2 min.

The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of DC signal/ DC pulse upto 330V and for any value beyond this, the meter shall log the event into memory as 'NEUTRAL DISTURBANCE' with date & time stamp and shall show 'ND 'in the display after time delay of 2 min(occurrences and restoration time).

The meter shall record energy proportional to the current and V Ref (240V) when any of the tamper circuits enclosed as per annexure are used to tamper energy using a diode or a variable resistance or a variable capacitance energy saving device and meter should recorded ND in meter memory. The measurement by meter shall not get influenced by injection of AC Voltages/Chopped signal/DC signal/ DC pulse of low frequency and harmonics. The meter should be immune to such Neutral Disturbance. In case the meter accuracy is disturbed under Neutral Disturbance, it should be able to log the event.

Single Wire

Single Wire tamper (Neutral Missing): When neutral is disconnected from both load side and supply side, the meter should record energy as per rated parameters (Vref). However, meter shall start registering energy

At a current of >500mA under tamper condition of neutral missing (where battery is used for voltage reference). Meter will perform the fraud energy registration above 500mA assuming Vref (from battery) and Unity power factor.

Condition no. 38 of Annexure I (Timer test) : The timer operation duration shall be 30 seconds.

Abnormal and Tamper conditions:

The meter shall record forward energy under any abnormal conditions as given in the annexure I.

All the tamper events i.e. shall be logged in the memory of the meter with date and time stamp of occurrence and restoration along with instantaneous electrical parameter (Voltage, Current (phase and neutral), energy, pf , frequency
)

Meter shall store cumulative count and cumulative durations of all the tamper event which have logged by meter from the date of energization till life of meter.

Tamper count shall be incremented only on the occurrence of the any tamper event with date and time

Stamp on FIFO basis. The event of which the restoration not occurred those should not be removed from meter memory and FIFO should not applicable for unrestored event.

The cover open tamper detection should be through heavy duty, sturdy micro switch such that it should not Operate on vibration or impact during handling or testing.

Meter shall have neutral CT for tamper identification and analysis.

The size of compartments should be such that all above event are accommodated in the assigned event compartment.
i.e. if in case of voltage compartment assigned to 4 number of events then the minimum size of this compartment should be such that it should accommodate sum of all maximum number of events as per below table.

Transaction event compartment size shall be minimum 100 events

Persistence time for occurrence and restoration for the events and compartment block size shall be as per table given.

S.NO.	EVENT (BCS)	IN METER DISPLAY	COMPARTMENT SIZE
1	MAGNET	MAGNET	25
2	HV ESD	ESD	25
3	NEUTRAL DISTURBANCE	ND	25
4	SINGLE WIRE (SW)	SW	25
5	METER COVER OPEN	C OPEN	2
6	Relay Connect/Disconnect	RL CON/ RL DIS	10

Compartment	Event Description	Size	Occurrence	Time for occurrence	Restoration	Time for restoratio n
1	Current reversal,	25	Active current negative	2 Min		2 Min
2	Over current	25	> 59 Amp	2 Min	< 60 Amp	2 Min
3	Current mismatch	25	In-Ip >= 20% Ib and In>Ip	2 Min	In-Ip<20% Ib	2 Min
4	Earth Load	25	Difference between Phase and Neutral current more than 10%	5 Min	Difference between Phase and Neutral current less than 10%	5 Min
5	Single Wire / Neutral Cut / Netural missing	25	If neutral is removed and current drawn > 0.2%Ib in other wire	2 Min	If neutral is restored and meter is in normal condition	2 Min
6	Neutral Disturbance	25	(1) Vph > 150% Vref OR (2) In case of external signal injection (Chopped DC, Chopped AC and DC injection through diode) OR both above	2 min	If meter is in normal condition	2 Min
7	H.V. Tamper	5	Vph > 110% of Vref	5 min	Vph < 110% of Vref	5 min
8	Low Voltage	25	120>Vphase< 216	30 min	Vphase > 215	5 min
9	ESD/JAMMER Tamper	25	> 50 KV	immediate	Removal of ESD/Jammer signal	immediate
10	Magnet	25	Whenever meter sense abnormal magnetic field it shall record Active and Apparent energy at Imax at UPF	immediate	If magnet is removed and meter is in normal condition	immediate

Com part ment	Event Description	Size	Occurrence	Time for occurrence	Restoration	Time for restoratio n
11	Power On/OFF	20	Actual voltage Off.	60 sec		immediate
12	Cover Open	5	When cover opens by more than 2 to 4 mm.	Immd		
13	Temperature Rise	25	Occ: T > 70˚C REC: T < 60˚C	2		
14	NIC card Removed (Immediate)	25	OCC: On removal of card RES: On Inserction card	Immediate		

In case of bidirectional meter, reverse current & magnet tamper conditions shall be modified accordingly.

Anti-tamper features

The meter shall continue recording energy under tamper conditions as defined in IS 15959 Part 2 and would log the event and send alarm at Head End System after detection of the defined tamper features as per IS 15959 Part 2.

Type Tests & Test Certificates

Smart Meter shall be type tested for all the tests as per relevant parts of IS 16444 (latest versions) and certified by Indian Standard wise list of BIS recognized labs as available at https://bis.gov.in/index.php/laboratorys/list-of-bis-recognized-lab/. The number of sampling for testing of meters and criteria for conformity would be as per IS 16444 (as amended up to date). Necessary copies of test certificates shall be submitted as per agreement with the Utility/AMI-IA.

Routine & Acceptance Tests

The Factory Acceptance and Routine tests shall be carried out as per IS 16444 Part 1.

General & Constructional requirements

Meter shall be BIS marked as per IS 16444 Part 1. General & construction requirement shall be as per IS 16444/IS 13779

Meter base & cover - Meter base & cover shall be as per IS 16444 Part1 / IS 13779. The meter Base & cover shall be Encapsulated type with "screwless break to open" design conform to the degree of protection IP 54 against ingress of dust, moisture and vermin.

The meter Base & cover shall be ultrasonically welded / Chemically welded or other suitable bonding technology and it will not be possible to remove the cover from the base without evidence of damage and necessary sealing provision shall be provided on the both sides of the meter.

Terminal block & cover - As per IS 16444 Part 1/IS 13779

The terminal cover shall be transparent and short. The terminal cover shall be fully enclosed type. The connection diagram shall be marked on Terminal Block cover.

Design

Voltage circuit, sealing arrangement, terminal block, terminal cover, and nameplate etc. shall be in accordance with IS-16444 Part 1(latest version).

The meter shall be compact and reliable in design, easy to transport and immune to vibration and shock involved in transportation and handling.

Name plate and marking

The name plate on the meter should be clearly visible, effectively secured against removal and indelibly/distinctly marked in accordance with relevant IS. In addition, "Name of the Utility/AMI- IA", purchase order no. & year/month of manufacturing shall be provided on the name plate. The ratingplate information shall be as per relevant IS. ***Connection diagram:*** As per IS 16444 Part 1

Fixing arrangements

The meter shall be mounted type. The Meter should have three fixing holes, one at top and two at the bottom. The Top hole should be such that the holding screw is not accessible to the consumer after fixing the meters. The lower screws should be provided under sealable terminal cover.

Sealing arrangement:

Arrangements shall be provided for proper sealing of the meter cover so that access to the working parts shall not be possible without breaking the seal. The sealing arrangement and number of seals shall be as per relevant IS/ requirement of Utility/AMI-IA.

The sealing point shall be as per CEA regulation 2006 with latest amendments. Supplier shall fix tamper evident barcoded holographic seal on left side of the meter. It shall not be possible to remove the seal intact. Details of holographic seals used by supplier shall be provided in hard as well as in soft copy on CD/email as per format given by BEST. Additional seals will be provided by BEST to supplier for putting them on meter body as per requirement.

Packing

The meters shall be suitably packed for vertical/horizontal support to withstand handling during transportation. The meter shall be packed appropriately to ensure safe transportation, handling, identification, and storage. All packing materials shall be as per environment law in force. The primary packing shall ensure protection against humidity, dust, grease and safeguard the meter's performance until its installation. The secondary packing shall provide protection during transportation. The packing case shall indicate "Fragile in nature" and direction of placement of box. The packing shall indicate marking details like Manufacturer's name, S.No. of meters, quantityetc.

Transportation

- The meter shall be compact in design. The meter block unit shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation.
- The meter shall be convenient to transport and immune to shock and vibration during transportation and handling.
- The meter should not be exposed to undue shock and mishandling during transportation.
- The stacking of box inside transport media should be such as to avoid their free movement.
- The packing should also be protected from rain and dust by transport media.
- The AMISP shall be responsible for any damage during transit due to inadequate or improper packing.

Testing and Manufacturing Facilities at Manufacturer's Place

The manufacturer shall have facilities of conducting Acceptance Testing as per IS 16444 Part 1.

Inspection

- The meters shall be sealed as per the mutual agreement of the supplier and the purchaser
- The Utility/AMI-IA/ purchaser may inspect the meter randomly as per sampling plan for acceptance testas per IS 16444 Part 1. The meters shall be tested for acceptance test as per IS 16444 Part 1
- All meters are factory tested at manufacturer's work place and RTR (Routine Test Report) to be submitted to BEST for each meters in soft copy before dispatch of meters.

Tender sample

- Tenderer shall submit 3 sample meters out of which one sample meter shall be without Ultrasonic welding to confirm constructional features and other destructive tests if any.
- After successful passing the tests carried out at BEST laboratory the tenderer shall give the demonstration of the meter offered against the tender to demonstrate the features incorporated in the meter.
- Sample meter submitted against the tender will not be returned to the supplier till the completion of guarantee period.

Guarantee.

- 7.5 years from the date of dispatch or 7 year from date of commissioning, whichever is earlier
- Manufacturer shall undertake a guarantee to replace meter up to a period of 7 Year from the date of supply. The meters which are found defective/inoperative within the guarantee period shall be replaced as per meter service level agreement.

Sr No	Component function	Requirement	Preferable Makes and Origin
1	Measurement or Computing Chips.	The measurement or computing chips used in the meter shall be with the Surface mount type along with Application Specific Integrated Circuits (ASIC).	USA: Analog Devices, Cyrus Logic, Atmel, Philips, Teridian, Dallas, ST, Texas Instruments, Motorola, Maxim, National Semiconductors, Freescale, On semiconductors. Germany: Siemens. South Africa: SAMES. Japan: NEC, Toshiba, Renesas, Hitachi. Austria: AMS. Holland: Philips (NXP).
2	Memory Chips.	The memory chips shall not be affected by external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel,Teridian, National Semiconductors, Philips, Texas Instruments, ST, Microchip, Spanson (Fujitsu), Ramtron. Japan: Hitachi, Renasas, Oki. Germany: Siemens.
		Meter shall have Non-Volatile Memory (NVM) to store energy meter data.	
		NVM shall be external (Outside ASIC).	
		In case of input power fail to Energy Meter it shall record last sampled important data in EEPROM using capacitance tank of power supply. Use of Non- rechargeable battery should only be restricted to minimum absolute power requirement of meter. Non-rechargeable battery shall not be used for this function.	
3.	Display Modules.	The display modules shall be well protected from the external Ultra Violet (UV) radiations.	Display Make:- Singapore: E-smart, Bonafied Technologies,Display Tech. Korea: Advantek, Jebon, Union Display Inc. Japan: Hitachi, Sony, L&G. Malaysia: Crystal ClearTechnology. Holland/Korea: Phillips. Hongkong: Genda. China: Tianma, JIA.
		The display visibility shall be sufficient to read the meter mounted at height of 0.5 meter as well as at the height of 2 meters.	
		The construction of the modules should be such that the displayed quantity shall not disturbed with the life of display (PIN Type).	
		It shall be trans reflective STN (STN – Super Twisted Nematic (160°) type industrial grade with extended temperature range.	

4	Optical Port.	Optical port shall be used to transfer the meter data to Common Meter Reading Instrument (CMRI/ DCU). The mechanical construction of the port shall be such to facilitate the data transfer easily.	USA: National Semiconductors, HP, Optonica, ST. Holland/Korea: Phillips. Japan: Hitachi. Taiwan: Ligitek. Osram, Everlight, Liteon, Avego.

Sr	Component	Requirement Preferable Makes and Origin No	function
5	Electronic Components.	The active and passive components shall be of the surface mount type and are to be handled and soldered by the state of art assembly processes.	USA: National Semiconductors, Atmel, Philips, Texas Instruments, BC Component, Analog devices, ST, Maxim, Kemet, On semiconductors, Freescale, Intersil, Raltron, Fairchild, Muruta, Agilent, AVX, Abracon, Sipex, Diode Inc., Honeywell, Power Integration, Fox, Roham, Onsemi. Japan: Hitachi, Oki, AVZ or Ricoh, Toshiba, Epson, Kemet,
			Alps, Muruta, TDK, Sanyo, Samsung, Panasonic. Korea: Samsung. India: Keltron, Incap, VEPL, PEC, RMC, Gujarat Polyavx, Prismatic, MFR Electronic components Pvt. Ltd, Cermet. Germany: Vishay, Epcos, Diotech, Kemet.
		The Plated Through Hole (PTH) component should be positioned such a way that the leads of the component shall not be under stress and not touching the internal wires.	
6	Battery.	Non rechargeable Lithium battery with guaranteed life of about 10 years shall be used.	Varta, Tedirun, Sanyo or National, Panasonic, Tekcell, Vitzrocell, Mitsubishi.
		Battery for RTC and for Meter Display in absence of Power shall be Separate.	
7	RTC.	The accuracy of RTC shall be as per relevant IEC/IS standards.	USA: Philips, Dallas Atmel, Motorola, Microchip, Maxell, Renata Japan: NEC or Oki.
8	Measuring Element.	Measuring elements used shall be as per Clause No. 8.11 of the specification.	
9	Power Supply.	The power supply shall be with the capabilities as per the relevant standards.	
		The power supply unit of the meter shall not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	
		The ratings of Power Supply module and power consumed by various modules and circuits shall be specified.	

Sr No	Component function	Requirement	Preferable Makes and Origin
		The power supply shall be at least 125% rated than the maximum load on the power supply.	
		In case of capacitive power supply, the voltage rating of series power circuit capacitor shall be adequate to withstand 440V AC applied at meter terminals continuously for 5 minutes without damage.	
		All the electrolytic capacitors shall have preferably low ESR value.	
10	Electrical Components.	The internal electrical component shall be of electrolytic copper & shall be protected from corrosion, rust etc.	
11	Mechanical Parts.	The other mechanical components shall be protected from corrosion etc. by suitable plating/painting methods.	
12	P.C.B.	Glass Epoxy, fire resistance grade FR4 with adequate strength.	
		PCB shall be Bare Board Test (BBT) certified.	
		The meter shall preferably with minimum jumper/wires/connectors.	
		PCB shall be suitably masked with protection coating.	
13	Push Button.	Carbon pill and silicon rubber contact / Tactile/ Captive Push button type high performance push buttons shall be used.	
14	Magnetic Tamper Detection Sensor.	Hall Effect IC / Inductor Sensor shall be used.	Make-Diode, Allegro etc.
15.	Load Switch	Load switch shall be of rating similar to Energy meter rating.	Superior in quality as similar to branded miniature circuit breaker.

Annexure B Technical Specifications for Whole Current A.C. Three Phase Smart EnergyMeter

Scope

The specification covers the design, manufacturing, testing, supply, and delivery of AC whole current 3 phase 4 wires Smart Energy Meter with bidirectional communication facility suitable for Advanced Metering Infrastructure (AMI) with connect/disconnect switch. The meter shall communicate with Head End System (HES) on any one of the communication technologies mentioned in IS16444 Part 1, as per the requirement of the Utility/AMI-IA / authorized system integrator.

Basic Features

The Smart Meter would have the following minimum basic features-

- Measurement of electrical energy parameters
- Bidirectional Communication
- Integrated Load limiting switch /relay
- Tamper event detection, recording and reporting
- Power event alarms as per IS 16444 Part 1
- Remote firmware upgrade
-
- TOD feature
- Net Metering(kWh) features (optional as per requirement of Utility/AMI-IA)
- On demand reading

General standards applicable for meters

S. No.	Standard No.	Title
1	IS 13779 with latest amendments	AC Static Watt-hour Meter class 1& 2
2	IS 15884 with latest amendments	Alternating Current Direct Connected Static Prepayment Meters for Active Energy (Class 1 and 2)-Specification
3	IS 16444 Part 1 with latest amendments	A.C. Static Direct Connected Watt Hour Smart Meter Class 1 and 2- Specification
4	IS 15959 Part 1 & Part 2 with latest amendments	Data Exchange for Electricity Meter Reading, Tariff and Load Control-Companion Standards

Communication

Meter shall have the ability to communicate with Head End System (HES) on any one of the communication technologies mentioned in IS16444 Part 1 (RF / Cellular) in a secure manner.The selection of communication technology should be as per the site conditions and as per design requirement of AMI Implementing agency to meet the performance as per agreed Service Level Agreements (SLAs). In case of Cellular based meter, the meter shall accommodate SIM card/ e-SIM of any service provider. The meter shall log the removal of the plug-in type communication module removal /nonresponsive event with snapshot.

Remote connect/disconnect/load limiting: Remote Connect/disconnect/Load control facilities would be as per IS 16444 part 1.

Other Specifications

Features	Minimum requirement of features

Applicable Standards	The meters shall comply with IS 16444 Part 1 for all requirements.
Reference Voltage	As per relevant IS
Current Rating	10-60 A / 20-100 A
Category	UC1
Starting Current	As per IS 16444 Part 1
Accuracy	Class 1.0 as per IS 16444 Part 1
Limits of error	As per IS 16444 Part 1
Operating Temperature range	As per IS 13779
Humidity	As per IS 13779
Frequency	As per IS 16444 Part 1
Influence Quantities	As per IS 16444 Part 1
Power Consumption of meter	As per IS 16444 Part 1
Current and Voltage Circuit	As per IS 16444 Part 1
Running at No Load	As per IS 16444 Part 1
Test output device	As per IS 16444 Part 1
Meter Display	As given in the document
Name Plate & marking Meter Display	i. Manufacturer's name ii. Type designation iii. Number of phases and wires iv.Serial number (Meter serial number shall be laser printed on name plate instead on sticker). v. Serial number along with barcode vi. Month and Year of manufacture vii. Unit of measurement viii. Reference voltage ,frequency ix. Ref. temperature x. Rated basic and maximum Current xi. Meter constant (imp/kWh) xii. 'BIS' Mark xiii. Class index of meter xiv. Property of BEST Undertaking xv.Purchase Order No. & date xvi. Guarantee period. xvii. Sign of double square xviii. Country of manufacture. xix. Firmware version of meter xx.Symbol of load switch.

Features	Minimum requirement of features
	xxi.NIC serial NO (Shall be visible from Communication Module Slot) xxii.Compatibility of NIC Card.
Parameters to be measured	As per IS 16444 Part 1 / As per IS 15959 Part-2 RF/ GSM signal Strength in milli db to be available in instantaneous parameters. All energies and demand will be available TOD wise in billing/ LS parameters.
Maximum Demand resetting	As per IS 15959 Part-2
Time of Use registers	As given in the document
Power Quality Information	As per IS 15959 Part-2
LED/LCD Indicators	As per IS 16444 Part 1
Load Survey/Interval Data	DIP: 15 min SIP:15 min LS Days: 45
Tamper/ Event Recording	As given in the document
Measuring Elements	a. Current Transformer shall be provided as measuring element in the phase circuit. b. Additional CT/Shunt shall be provided in the neutral circuit of meter to detect phase CT bypass. Any unbalance current of vector summation of all three phase currents, if not recorded as neutral current, to be treated as tamper event, and also current imbalance to be detected. c. The meter shall have CTs with Magnetic shielding and same shall be tested separately prior to assembly. d. The Current Transformers used shall not saturate with passage of DC current as per IS: 13779:1999 with latest amendments.
Alarm	As per IS 16444 Part 1 / As per IS 15959 Part-2
Load Control	As per IS 16444 Part 1
Connect/Disconnect switch	UC1 as per IS 16444 Part 1
Status of Load switch	As per IS 16444 Part 1
Programmability	As per IS 16444 Part 1
Communication	As per IS 16444 Part 1
Communication Protocol	As per IS 16444 Part 1
Remote Firmware upgrade	As per IS 15959 Part-2
Real Time Clock (RTC)	As per IS 16444 Part 1 / IS 15959 Part 1 & Part 2
Data Retention	As per IS 16444 Part 1

Battery Backup	Meter shall be supplied with adequate separate battery backup for RTC.
First Breath (Power on) and Last gasp (Power off) condition detection and communication to HES	As per IS 16444 Part 1

Features	**Minimum requirement of features**
Plug-in Communication Module	The Smart Meters shall be have a dedicated sealable slot for accommodating plug-in type bi -directional communication module which shall integrate the respective communication technology (RF Mesh/ Cellular) with the Smart Meters, leading to easy adaptability for network interfaces (WAN/NAN).The Plug-In module shall be field hot swappable/ replaceable. Same NIC shall work with different types of meters of same make (1P, 3P, LTCT, HT etc).
Optical Port	The meter shall have optical port for downloading data. Optical port shall be with a rust resistance coated metal ring to hold magnet of downloading probe. The optical head used for meter reading shall comply with IEC 62056- 21 as far as physical construction is concerned. 10 Nos. of optical chords shall be provided for downloading the data from Meter to PC using BCS software in the Lab. The Optical Port provided on meter shall have flap & sealing provision.
Calibration	Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However parameters like RTC, TOD slots & timings, DIP (billing & load survey), billing date change, relay connect/Disconnect, Set load limit, Pre paid/post paid, Set metering mode (Import/Export), display setting shall be reconfigure through CMRI and remotely over the air (OTA), and any other support will be provided without any additional cost to BEST till the useful life of the meters.
Meter Dimension in MM	Is not more than 250(Height)*200(Width)*100(Depth)

Software and communication compatibility	The bidder shall supply software required for communication though local (CMRI and BCS software) and remote (AMI) connectivity free of cost and necessary training. For existing meter manufacturer, it should be ensured that all meters (existing non-smart &upcoming smart meters) can be read through one BCS only. The list of OBIS codes for the parameters will be provided at the time of placement of PO in case of not specified in IS 15959. There shall be facility to export the data in Excel/txt/csv/PDF and XML format.
KVAH & KVA calculation	Meter shall be programed as Lag+ Lead configuration i.e. Leading PF shall not be considered as unity
Features	**Minimum requirement of features**
Internal component specification	AS given in the document

Data display facility (auto/manual)

a) The offered meter shall be capable of recording and displaying following readings in Auto mode display. The display shall follow the following sequence as mentioned below in interval of 10 seconds automatically.

b) Minimum 7-digit integers for energy parameters shall be provided.

Sequence	Display
1	Complete LCD Test.
2	Meter Number.
3	Present Time.
4	Present Date.
5	Current kWh.
6	Current kWh for ToD 1
7	Current kWh for ToD 2
8	Current kWh for ToD 3
9	Current kWh for ToD 4
10	Current kWh for ToD 5
11	Current kVAh.
12	Current kVAh for ToD 1
13	Current kVAh for ToD 2
14	Current kVAh for ToD 3

15	Current kVAh for ToD 4
16	Current kVAh for ToD 5
17	Current Total kVARh lag.
18	Current Total kVARh lead.
19	Current Max MD in kVA with date and time for ToD 1
20	Current Max MD in kVA with date and time for ToD 2
21	Current Max MD in kVA with date and time for ToD 3
22	Current Max MD in kVA with date and time for ToD 4
23	Current Max MD in kVA with date and time for ToD 5
24	Instantaneous Power Factor.
25	Instantaneous R ph Voltage.
26	Instantaneous Y ph Voltage.
27	Instantaneous B ph Voltage.
28	Instantaneous R ph Current.
29	Instantaneous Y ph Current.
30	Instantaneous B ph Current.
31	Neutral Current.
32	Instantaneous kW load.
33	Instantaneous kVAr load.
34	Instantaneous KVA load.
35	Instantaneous Frequency.
36	Current MD in kVA with date and time.

After last sequence, the first sequence shall be automatically displayed.

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2 Push Button Mode:-

Following parameters shall be displayed on pressing the buttons (Scroll up & down):-

Sequence	Display
1	Segment Check Display (LCD Test)
2	BEST Meter Serial Number.
3	Real Time
4	Real Date
5	Bill kWh
6	Bill kWh for ToD 1
7	Bill kWh for ToD 2
8	Bill kWh for ToD 3

9	Bill kWh for ToD 4
10	Bill kWh for ToD 5
11	Bill kVAh.
12	Bill kVAh for ToD 1
13	Bill kVAh for ToD 2
14	Bill kVAh for ToD 3
15	Bill kVAh for ToD 4
16	Bill kVAh for ToD 5
17	Bill kVARh–Lag.
18	Bill kVARh–Lead.
19	Bill MD in kVA with date and time for TOD1
20	Bill MD in kVA with date and time for TOD2
21	Bill MD in kVA with date and time for TOD3.
22	Bill MD in kVA with date and time for TOD4
23	Bill MD in kVA with date and time for TOD5.
24	Bill Average Power Factor.
25	Cumulative MD Total.
26	Cumulative MD in kVA with date and time for TOD1
27	Cumulative MD in kVA with date and time for TOD2.
28	Cumulative MD in kVA with date and time for TOD 3
29	Cumulative MD in kVA with date and time for TOD 4
30	Cumulative MD in kVA with date and time for TOD 5.
31	MD Reset Count.
32	Last Magnetic Tamper event date and time.

Meter Display Sequence of NET SMART METER

1 Auto Mode:-

Sequence	Display
1	Complete LCD Test
2	BEST Meter Serial Number.
3	Present Date
4	Present Time
5	Current CKWh Reading (Import)

Sequence	Display
6	Current CKVAh Reading while Active (Import)
7	Current CRKVAh Reading Lag (Import)
8	Current CRKVAh Reading Lead (Import)
9	Current KWh Reading for TOD1 (Import)

10	Current KWh Reading for TOD2 (Import)
11	Current KWh Reading for TOD3 (Import)
12	Current KWh Reading for TOD4 (Import)
13	Current KWh Reading for TOD5 (Import)
14	Current KVAh Reading for TOD1 (Import)
15	Current KVAh Reading for TOD 2 (Import)
16	Current KVAh Reading for TOD 3 (Import)
17	Current KVAh Reading for TOD 4 (Import)
18	Current KVAh Reading for TOD 5 (Import)
19	Current Maximum Demand with date and time in KVA of Billing Period for TOD1 (Import)
20	Current Maximum Demand with date and time in KVA of Billing Period for TOD2(Import)
21	Current Maximum Demand with date and time in KVA of Billing Period for TOD3 (Import)
22	Current Maximum Demand with date and time in KVA of Billing Period for TOD4 (Import)
23	Current Maximum Demand with date and time in KVA of Billing Period for TOD5 (Import)
24	Current CKWh Reading (Export)
25	Current CKVAh Reading while Active (Export)
26	Current CRKVAh Reading Lag (Export).
27	Current CRKVAh Reading Lead (Export).
28	Current KWh Reading for TOD1 (Export)
29	Current KWh Reading for TOD2 (Export)
30	Current KWh Reading for TOD3 (Export)
31	Current KWh Reading for TOD4 (Export)
32	Current KWh Reading for TOD5 (Export)
33	Current KVAh Reading for TOD1 (Export)
34	Current KVAh Reading for TOD 2 (Export)
35	Current KVAh Reading for TOD 3 (Export)
36	Current KVAh Reading for TOD 4 (Export)
37	Current KVAh Reading for TOD 5 (Export)
38	Current Maximum Demand with date and time in KVA of Billing Period for TOD1 (Export)
39	Current Maximum Demand with date and time in KVA of Billing Period for TOD 2(Export)
40	Current Maximum Demand with date and time in KVA of Billing Period for TOD3 (Export)
41	Current Maximum Demand with date and time in KVA of Billing Period for TOD4 (Export)
42	Current Maximum Demand with date and time in KVA of Billing Period for TOD5 (Export)

43	Instantaneous Power Factor
44	Instantaneous R ph Voltage.
Sequence	**Display**
45	Instantaneous Y ph Voltage
46	Instantaneous B ph Voltage.
47	Instantaneous R ph Current.
48	Instantaneous Y ph Current
49	Instantaneous B ph Current.
50	Neutral Current.
51	Instantaneous Active kW load. (Import/Export)
52	Instantaneous Apparent kVA load. (Import/Export)
53	Instantaneous Reactive KVAr load. (Import/Export)
54	Instantaneous Frequency.

Push Button Mode:-

Sequence	Display
1	Complete LCD Test
2	BEST Meter Serial Number.
3	Present Date
4	Present Time
5	Cumulative KWh Reading at Bill Point (Import)
6	Cumulative KVAh Reading at Bill Point (Import)
7	Cumulative RKVAh Reading Lag at Bill Point (Import)
8	Cumulative RKVAh Reading Lead at Bill Point (Import)
9	Cumulative KWh Reading for TOD1 at Bill Point (Import)
10	Cumulative KWh Reading for TOD 2 at Bill Point (Import)
11	Cumulative KWh Reading for TOD 3 at Bill Point (Import)
12	Cumulative KWh Reading for TOD 4 at Bill Point (Import)
13	Cumulative KWh Reading for TOD 5 at Bill Point (Import)
14	Cumulative KVAh Reading for TOD1 at Bill Point (Import)
15	Cumulative KVAh Reading for TOD2 at Bill Point (Import)
16	Cumulative KVAh Reading for TOD3 at Bill Point (Import)
17	Cumulative KVAh Reading for TOD 4 at Bill Point (Import)
18	Cumulative KVAh Reading for TOD 5 at Bill Point (Import)
19	Maximum Demand in KVA with date and time of Billing Period for TOD1 (Import).
20	Maximum Demand in KVA with date and time of Billing Period for TOD2 (Import).
21	Maximum Demand in KVA with date and time of Billing Period for TOD3 (Import).

22	Maximum Demand in KVA with date and time of Billing Period for TOD4 (Import).
23	Maximum Demand in KVA with date and time of Billing Period for TOD5 (Import).
24	Bill Average Power Factor (I).
25	Cumulative KWh Reading at Bill Point (Export).
26	Cumulative KVAh Reading at Bill Point (Export)
27	Cumulative RKVAh Reading Lag at Bill Point (Export)
28	Cumulative RKVAh Reading Lead at Bill Point (Export)
29	Cumulative KWh Reading for TOD1 at Bill Point (Export)
Sequence	**Display**
30	Cumulative KWh Reading for TOD 2 at Bill Point (Export)
31	Cumulative KWh Reading for TOD 3 at Bill Point (Export)
32	Cumulative KWh Reading for TOD 4 at Bill Point (Export)
33	Cumulative KWh Reading for TOD 5 at Bill Point (Export)
34	Cumulative KVAh Reading for TOD1 at Bill Point (Export)
35	Cumulative KVAh Reading for TOD2 at Bill Point (Export)
36	Cumulative KVAh Reading for TOD3 at Bill Point (Export)
37	Cumulative KVAh Reading for TOD 4 at Bill Point (Export)
38	Cumulative KVAh Reading for TOD 5 at Bill Point (Export)
39	Maximum Demand in KVA with date and time of Billing Period for TOD1 (Export).
40	Maximum Demand in KVA with date and time of Billing Period for TOD2 (Export).
41	Maximum Demand in KVA with date and time of Billing Period for TOD3 (Export).
42	Maximum Demand in KVA with date and time of Billing Period for TOD4 (Export).
43	Maximum Demand in KVA with date and time of Billing Period for TOD5 (Export).
44	Bill Average Power Factor (E).
45	MD Reset Count.

1) The Auto mode (default display) shall switch to Push button mode display (On Demand Display Mode) after pressing the push button.

2) The Push Button display mode shall switch over to Auto mode display (default display) if the push button is not operated for 15 seconds.

3) Display of MD (kVA or kW) shall have 3-digit integer and 3 digit decimal and display of cumulative MD shall have 4-digit integer and 3 digit decimal.

4) Instantaneous values of lead Power Factor shall be shown with negative sign while lag PF shall be shown without sign on the display

High Resolution Mode

Following parameters shall be displayed in High Resolution Mode with 3 digit integer +4 digit decimals.

Sequence	Display
1	KWh Reading (Import).
2	RKVAh Reading Lag (Import).
3	RKVAh Reading Lead (Import).
4	KWh Reading (Export).
5	RKVAh Reading Lag (Export).
6	RKVAh Reading Lead (Export).
7	KVAh Reading (Import).
8	KVAh Reading (Export).

i) The Auto mode display (default display) shall switch to High Resolution Display Mode after pressing the push button continuously for 10 seconds.

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ii) The High Resolution Display Mode shall switch over to Auto mode (default display) if the push button is not operated for 60 seconds

Meter display should not go in to sleep mode during Power-On condition in case the push button is notoperated for more than 10 minutes.

TOD Feature:

The meter shall be capable of measuring Cumulative Energy (KWh), KVarh Lag, Kvarh Lead, Kvah and MD (KW, KVA)with time of day (TOD) registers having 5 zones (no. of zones & time slot shall be programmable by CMRI with adequate security level). TOD Slot Configuration shall be as follows-

Slot	Time Slots
TOD 1	22 to 06 Hrs
TOD 2	06 to 09 Hrs
TOD 3	09 to 12 Hrs
TOD 4	12 to 18 Hrs.
TOD 5	18 to 22 Hrs

Immunity against external influencing signals: Magnetic Field:

Meter shall record accurate energy in case of any external influencing signals in line with IS 13779:1999 Cl.11.2 and variation in limits of error (upto 100% Imax) shall be as per the table 13 of IS 14697. Meter shall be immune to magnetic field such that it shall not affect the normal overall functionality However, in case of abnormal magnetic field as defined below meter shall perform as per the following features:

a) Meter shall log the event in its memory as" MAGNET" with date and time stamp within 30 sec or immediate of application of abnormal magnetic field and shall start recording at 100% Imax and after removal of magnet, back to normal recording within 30 sec or immediate.
b) Meter shall show "Magnet" in the display.

Abnormal Magnetic field is defined as below;

a) Continuous DC magnetic induction: >0.20 Tesla ± 5%(Value of the magneto motive force to be applied shall be generally >10000 ATs, Should be immune up to 0.20Tesla)
b) AC magnetic induction: Immune for 10 milli Tesla (if produced with circular metal core with square cross section as specified in CBIP latest report with 2800 AT
c) Permanent Magnet: Immune up to 0.5T and Event logging >0.5T

Electrostatic Discharge (ESD)

Meter shall be immune up to 50 kV and shall record accurate energy as per IS-13779:1999. Meter shall log the event into memory as 'ESD' with date & time stamp for any ESD greater than 50 kV and shall show 'ESD' in the display.

The shielding around the meter shall be such that it does not get affected by high voltage, high and low energy impulse when comes in contact with meter from any side.

The meter should immune to high/ low frequency Jammer devices. Meter shall log event in its memory as jammer with date and time stamp along with snapshot.

The meter should be immune and log the tamper on application of any other higher magnetic field of any frequency waves, micro waves

Neutral Disturbance

The meter shall log in the memory as 'NEUTRAL DISTURBANCE' with date and time stamp and show 'ND' in the display for Frequency variation below 45 Hz and above 55 Hz with time delay of 2 min and for Pulsating DC and Chopped AC of any value with

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time delay of 2 min.

The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of DC signal/ DC pulse upto 330V and for any value beyond this, the meter shall log the event into memory as 'NEUTRAL DISTURBANCE' with date & time stamp and shall show 'ND 'in the display after time delay of 2 min(occurrences and restoration time).

The meter shall record energy proportional to the current and V Ref when any of the tamper circuits are used to tamper energy using a diode or a variable resistance or a variable capacitance energy saving device. The measurement by meter shall not get influenced by injection of AC Voltages/Chopped signal/DC signal/ DC pulse of low frequency and harmonics. The meter should be immune to such Neutral Disturbance. In case the meter accuracy is disturbed under Neutral Disturbance, it should be able to log the event.

Abnormal and Tamper conditions

The meter shall record forward energy under any abnormal conditions.

All the tamper events i.e. shall be logged in the memory of the meter with date and time stamp of occurrence and restoration along with instantaneous electrical parameter (Voltage, Current (phase and neutral) , energy, PF , frequency)

Meter shall store cumulative count and cumulative durations all the tamper event which have logged by meter from the date of energization till life of meter.

Tamper count shall be incremented only on the occurrence of the any tamper event with date and time
Stamp on FIFO basis. The event which is not restored should not be removed from its meter memory and
FIFO should not applicable for unrestored event.
The cover open tamper detection should be through heavy duty, sturdy micro switch such that it should not
Operate on vibration or impact during handling or testing.
The meter shall register correctly if supply neutral is not available at the meter neutral terminal. The meter shall work in absence of two incoming wires. It shall keep recording correctly in case of unbalance system voltage.

The meter shall keep working accurately irrespective of the phase sequence of the supply.

The meter shall be able to differentiate between actual CT reversals and condition arising out of unbalanced / unhealthy capacitor bank.
During Voltage Failure event, the meter shall record energy proportional to the current and V Ref (240V).
Meter shall have neutral CT for tamper identification and analysis.
The event compartments shall be IS 15959 Part-1 table 9. The size of compartments should be such that all above event are accommodated in the assigned event compartment. i.e. if in case of voltage compartment assigned to 4 number of events then the minimum size of this compartment should be such that it should accommodate sum of all maximum number of events as per below table. Transaction event compartment size shall be minimum 100 events

Persistence time for occurrence and restoration for the events and compartment block size shall be as per table given below

Sr. No.	Tampers/ Failures	Phase wise	Compartment Size	Logic/ Condition other than standard	Persistence time	
					Occ Time (min)	Rec Time (min)
1	Voltage Failure	YES	25	Occ: Voltage <192V: and current > 2% Ib.	5	5
				Res: Vph > 191V (Independent of current)		
2	Voltage unbalance	YES	25	Occ : (Vmax-Vph)>10% Vn and Vphase : 191>Vphase< 216	5	5
				Res : (Vmax-Vph)<10% Vn and Vphase : 191<Vphase> 216		
3	High Voltage	YES	25	Vph > 110% of Vref	30	30

4	CT open	YES	25	Occ: Ir+Iy+Ib+In>10% of Ib(vector Sum) and phase current<10% Ib with all current are positive Res: Ir+Iy+Ib+In<5% of Ib(vector Sum) and phase current>10% Ib with all current are positive	30	30
5	Current unbalance	YES	25	Occ : Imax – Imin > 30% of Iavg Res : Imax – Imin < 30% of Iavg	15	15
6	CT Bypass	YES	25	Occ: Ir+Iy+Ib+In>5% of Ib(vector Sum) and phase current>10% Ib with all current are positive Res: Ir+Iy+Ib+In>2.5% of Ib(vector Sum) and phase current<10% Ib with all current are positive	30	30
7	Current reversal	YES	25	1. Active current negative 2. PF > 0.3	2	2
8	Magnet	NO	25	Whenever meter sense magnetic field it shall record Active and Apparent energy at Imax at UPF	Immediate	Immediate
9	Neutral Disturbance	NO	25	Vph > 150% Vref In case of external signal injection (Chopped DC, Chopped AC and DC injection through diode)	5	5
10	ESD/JAMMER	NO	25	Occ: Immunity upto 50 KV, > 50KV event logged In memory Res: Removal of ESD and Jammer Device	2	2

Sr. No.	Tampers/ Failures	Phase wise	Compartment Size	Logic/ Condition other than standard	Persistence time	
					Occ Time (min)	Rec Time (min)
11	Low PF Tamper	YES	25	OCC: PF < +/- 0.5 and I>1%Ib REC: PF > +/- 0.7 and I>1%Ib	5	5
12	Top Cover open	NO	1	When cover opens by more than 2 to 4 mm.	Immediate	NA

13	Temperature Rise	NO	25	Occ: T >70˚C REC: T <60˚C	2	2
14	NIC card Removed (Immediate)	NO	25	OCC: On removal of card RES: On Inserction card	Immediate	Immediate
15	Power On/Off	NO	25	Occ: Actual voltage OFF Res: Actual voltage ON	5	5

In case of Bi-directional meters current reversal and magnet tamper conditions to be made accordingly.

Anti-tamper features

The meter shall continue recording energy under tamper conditions as defined in IS 15959 Part 2 and would log the event and send alarm at Head End System after detection of the defined tamper features as per IS 15959 Part 2.

Type Tests & Test Certificates

Smart Meter shall be type tested for tests as per relevant parts of IS 16444 (latest versions), and certified by Indian Standard wise list of BIS recognized labs as available at https://bis.gov.in/index.php/laboratorys/list-of-bis-recognized-lab/. The number of sampling for testing of meters and criteria for conformity would be as per IS 16444(as amended up to date). Necessary copies of test certificates shall be submitted as per agreement with the Utility/AMI-IA.

Routine & Acceptance Tests

The Factory Acceptance and Routine tests shall be carried out as per IS 16444 Part 1.

General & Constructional requirements

Meter shall be BIS marked as per IS 16444 Part 1. General & construction requirement shall be as per IS 16444/IS 13779

Meter base & cover - Meter base & cover shall be as per IS 16444 Part1 / IS 13779. The meter Base & cover shall be Encapsulated type with "screwless break to open" design conform to the degree of protection IP 54 against ingress of dust, moisture and vermin. 'Break to open' design. The material for meter base and cover shall be made of high-grade polycarbonate.

The meter Base & cover shall be ultrasonically welded / Chemically welded or other suitable bonding technology and it will not be possible to remove the cover from the base without evidence of damage and necessary sealing provision shall be provided on the both sides of the meter. ***Terminal block & cover*** - As per IS 16444 Part 1/IS 13779

Design

Voltage circuit, sealing arrangement, terminal block, terminal cover and nameplate etc. shall be in accordance with IS-16444 Part 1 (latest version). The meter shall be compact and reliable in design, easy to transport and immune to vibration and shock involved in transportation and handling

Name plate and marking

The meter should bear a name plate clearly visible, effectively secured against removal and indelibly/distinctly marked in accordance with relevant IS. In addition, "Name of the Utility/AMI- IA", purchase order no. & year/month of manufacturing shall be provided on the meter name plate. The rating plate information shall be as per relevant IS.

Connection diagram: As per IS 16444 Part 1

Fixing arrangements:
The meter shall be mounted type. The Meter should have three fixing holes, one at top and two at the bottom. The Top hole should be such that the holding screw is not accessible to the consumer after fixing the meters. The lower screws should be provided under sealable terminal cover. The requisite fixing screws shall be supplied with each meter.

Sealing arrangement:
Arrangements shall be provided for proper sealing of the meter cover so that access to the working parts shall not be possible without breaking the seal. The sealing arrangement and number of seals shall be as per relevant IS/ requirement of Utility/AMI-IA.
The sealing point shall be as per CEA regulation 2006 with latest amendments. Supplier shall fix tamper evident barcoded holographic seal on left side of the meter. It shall not be possible to remove the seal intact. Details of holographic seals used by supplier shall be provided in hard as well as in soft copy on CD/email as per format given by BEST. Additional seals will be provided by BEST to supplier for putting them on meter body as per requirement.

Packing
- The meters shall be suitably packed for vertical/horizontal support to withstand handling during transportation.
- The meter shall be packed appropriately to ensure safe transportation, handling, identification and storage.
- All packing materials shall be as per environment law in force. The primary packing shall ensure protection against humidity, dust, grease and safeguard the meter's performance until its installation.
- The secondary packing shall provide protection during transportation.
- The packing case shall indicate "Fragile in nature" and direction of placement of box.
- The packing shall indicate marking details like Manufacturer's name, meters #s, quantity, etc.

Transportation
- The meter shall be compact in design. The meter block unit shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation.
- The meter shall be convenient to transport and immune to shock and vibration during transportation and handling.
- The meter should not be exposed to undue shock and mishandling during transportation.
- The stacking of box inside transport media should be such as to avoid their free movement.
- The packing should also be protected from rain and dust by transport media.
- The AMISP shall be responsible for any damage during transit due to inadequate or improper packing.

Testing and Manufacturing Facilities at Manufacturer's Place
The manufacturer shall have facilities of conducting Acceptance Testing as per IS 16444 Part 1.

Inspection
- The meters shall be sealed as per the mutual agreement of the supplier and the purchaser
- The Utility/AMI-IA/ purchaser may inspect the meter randomly as per sampling plan for acceptance testas per IS 16444 Part 1. The meters shall be tested for acceptance test as per IS 16444 Part 1
- All meters are factory tested at manufacturer's work place and RTR (Routine Test Report) to be submitted to BEST for each meters in soft copy before dispatch of meters.

Tender sample

- Tenderer shall submit 3 sample meters out of which one sample meter shall be without Ultrasonic welding to confirm constructional features and other destructive tests if any.
- After successful passing the tests carried out at BEST laboratory the tenderer shall give the demonstration of the meter offered against the tender to demonstrate the features incorporated in the meter.
- Sample meter submitted against the tender will not be returned to the supplier till the completion of guarantee period.

Guarantee.

- 7.5 years from the date of dispatch or 7 year from date of commissioning, whichever is earlier
- Manufacturer shall undertake a guarantee to replace meter up to a period of 7 Year from the date of supply. The meters which are found defective/inoperative within the guarantee period shall be replaced as per meter service level agreement.

Sr No	Component function	Requirement	Preferable Makes and Origin
1	Measurement or Computing Chips.	The measurement or computing chips used in the meter shall be with the Surface mount type along with Application Specific Integrated Circuits (ASIC).	USA: Analog Devices, Cyrus Logic, Atmel, Philips, Teridian, Dallas, ST, Texas Instruments, Motorola, Maxim, National Semiconductors, Freescale, On semiconductors. Germany: Siemens. South Africa: SAMES. Japan: NEC, Toshiba, Renesas, Hitachi. Austria: AMS. Holland: Philips (NXP).
2	Memory Chips.	The memory chips shall not be affected by external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel,Teridian, National Semiconductors, Philips, Texas Instruments, ST, Microchip, Spanson (Fujitsu), Ramtron. Japan: Hitachi, Renasas, Oki. Germany: Siemens.
		Meter shall have Non- Volatile Memory (NVM) to store energy meter data.	
		NVM shall be external (Outside ASIC).	
		In case of input power fail to Energy Meter it shall record last sampled important data in EEPROM using capacitance tank of power supply. Use of Non- rechargeable battery should only be restricted to minimum absolute power requirement of meter. Non-rechargeable battery shall not be used for this function.	

Sr No	Component function	Requirement	Preferable Makes and Origin
3	Display Modules.	The display modules shall be well protected from the external Ultra Violet (UV) radiations. The display visibility shall be sufficient to read the meter mounted at height of 0.5 meter as well as at the height of 2 meters. The construction of the modules should be such that the displayed quantity shall not disturbed with the life of display (PIN Type). It shall be trans reflective STN (STN – Super Twisted Nematic (160°) type industrial grade with extended temperature range.	Display Make:- Singapore: E-smart, Bonafied Technologies, Display Tech. Korea: Advantek, Jebon, Union Display Inc. Japan: Hitachi, Sony, L&G. Malaysia: Crystal ClearTechnology. Holland/Korea: Phillips. Hongkong: Genda. China: Tianma, JIA.
4	Optical Port.	Optical port shall be used to transfer the meter data to Common Meter Reading Instrument (CMRI/ DCU). The mechanical construction of the port shall be such to facilitate the data transfer easily.	USA: National Semiconductors, HP, Optonica, ST. Holland/Korea: Phillips. Japan: Hitachi. Taiwan: Ligitek. Osram, Everlight, Liteon, Avego.
5	Electronic Components.	The active and passive components shall be of the surface mount type and are to be handled and soldered by the state of art assembly processes. The Plated Through Hole (PTH) component should be positioned such a way that the leads of the component shall not be under stress and not touching the internal wires.	**USA**: National Semiconductors, Atmel, Philips, Texas Instruments, BC Component, Analog devices, ST, Maxim, Kemet, On semiconductors, Freescale, Intersil, Raltron, Fairchild, Muruta, Agilent, AVX, Abracon, Sipex, Diode Inc., Honeywell, Power Integration, Fox, Roham, Onsemi. **Japan**: Hitachi, Oki, AVZ or Ricoh, Toshiba, Epson, Kemet, Alps, Muruta, TDK, Sanyo, Samsung, Panasonic. **Korea**: Samsung. **India:** Keltron, Incap, VEPL, PEC, RMC, Gujarat Polyavx, Prismatic, MFR Electronic components Pvt. Ltd, Cermet. **Germany:** Vishay, Epcos, Diotech, Kemet.
6	Battery.	Non rechargeable Lithium battery with guaranteed life of about 10 years shall	Varta, Tedirun, Sanyo or National, Panasonic, Tekcell, Vitzrocell, Mitsubishi

Sr No	Component function	Requirement	Preferable Makes and Origin
		be used. Battery for RTC and for Meter Display in absence of Power shall be Separate.	.

7	RTC.	The accuracy of RTC shall be as per relevant IEC/IS standards.	USA: Philips, Dallas Atmel, Motorola, Microchip, Maxell, Renata Japan: NEC or Oki.
8	Measuring Element.	Measuring elements used shall be as per Clause No. 8.11 of the specification.	
9	Power Supply.	The power supply shall be with the capabilities as per the relevant standards.	
		The power supply unit of the meter shall not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	
		The ratings of Power Supply module and power consumed by various modules and circuits shall be specified.	
		The power supply shall be at least 125% rated than the maximum load on the power supply.	
		In case of capacitive power supply, the voltage rating of series power circuit capacitor shall be adequate to withstand 440V AC applied at meter terminals continuously for 5 minutes without damage.	
		All the electrolytic capacitors shall have preferably low ESR value.	
10	Electrical Components.	The internal electrical component shall be of electrolytic copper & shall be protected from corrosion, rust etc.	
11	Mechanical Parts.	The other mechanical components shall be protected from corrosion etc. by suitable plating/painting methods.	
12	P.C.B.	Glass Epoxy, fire resistance grade FR4 with adequate strength.	
		PCB shall be Bare Board Test (BBT) certified.	
		The meter shall preferably with minimum jumper/wires/connectors.	
		PCB shall be suitably masked with protection coating.	

Sr No	Component function	Requirement	Preferable Makes and Origin
13	Push Button.	Carbon pill and silicon rubber contact / Tactile/ Captive push button type high performance push buttons shall be used.	
14	Magnetic Tamper Detection Sensor.	Hall Effect IC / Inductor Sensor shall be used.	Make-Diode, Allegro etc.
15	Load Switch	Load switch shall be of rating similar to Energy meter rating.	Superior in quality as similar to branded miniature circuit breaker.

Note: The tenderer shall submit soft/hard copy of data/information sheets of all meter parts/components.

i)In case purchase order is placed bills of material shall be shown at pre dispatch inspection at factory works. ii)Manufacturing process should be preferably automated and tenderer shall list out activities wherein human intervention is required for assembling/testing of meters. For such activities tenderer shall declare quality standard adopted for carrying out such skilled job.

OBIS Code for parameters

OBIS CODES-IMPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
1	Instantaneous R ph Voltage.	1.0.32.7.0.255	1.0.32.7.0.255
2	Instantaneous Y ph Voltage.	1.0.52.7.0.255	1.0.52.7.0.255
3	Instantaneous B ph Voltage.	1.0.72.7.0.255	1.0.72.7.0.255
4	Instantaneous R ph Current.	1.0.31.7.0.255	1.0.31.7.0.255
5	Instantaneous Y ph Current.	1.0.51.7.0.255	1.0.51.7.0.255
6	Instantaneous B ph Current.	1.0.71.7.0.255	1.0.71.7.0.255
7	Instantaneous Power Factor.	1.0.13.7.0.255	1.0.13.7.0.255
8	THD R ph Voltage	1.0.32.7.124.255	1.0.32.7.124.255
9	THD Y ph Voltage	1.0.52.7.124.255	1.0.52.7.124.255
10	THD B ph Voltage	1.0.72.7.124.255	1.0.72.7.124.255
11	THD R ph Current.	1.0.31.7.124.255	1.0.31.7.124.255
12	THD Y ph Current.	1.0.51.7.124.255	1.0.51.7.124.255
13	THD B ph Current.	1.0.71.7.124.255	1.0.71.7.124.255
14	Displacement Power Factor.		Not Specified
15	Instantaneous 3ph kW load (Import).	1.0.1.7.0.255	1.0.1.7.0.255
16	Instantaneous 3ph kVAr load with lag lead indication (Import).	1.0.3.7.0.255	1.0.3.7.0.255

17	Instantaneous 3ph KVA load (Import).	1.0.9.7.0.255	1.0.9.7.0.255
18	THD Active Power R ph	1.0.35.7.124.255	1.0.35.7.124.255
19	THD Active Power Y ph	1.0.55.7.124.255	1.0.55.7.124.255
20	THD Active Power B ph	1.0.75.7.124.255	1.0.75.7.124.255
21	Active Power Total R ph	1.0.21.7.0.255	1.0.21.7.0.255
22	Active Power Total Y ph	1.0.41.7.0.255	1.0.41.7.0.255

Instantaneous Profile 1.0.94.91.0.255 1.0.94.91.0.255

Instantaneous Scaler 1.0.94.91.3.255 1.0.94.91.3.255

23 Active Power Total B ph 1.0.61.7.0.255 1.0.61.7.0.255

24 Active Power Fundamental R ph 1.0.130.7.0.255 1.0.130.7.0.255

25 Active Power Fundamental Y ph 1.0.131.7.0.255 1.0.131.7.0.255

26 Active Power Fundamental B ph 1.0.132.7.0.255 1.0.132.7.0.255

27 Instantaneous Frequency. 1.0.14.7.0.255 1.0.14.7.0.255

28 Real Time Clock – Date and Time 0.0.1.0.0.255 0.0.1.0.0.255

29 Current Cumulative kWh (Import). 1.0.1.8.0.255 1.0.1.8.0.255

30 Current kWh ToD 1 (Import). Not Specified 1.0.1.8.1.255

31 Current kWh ToD 2 (Import). Not Specified 1.0.1.8.2.255

32 Current kWh ToD 3 (Import). Not Specified 1.0.1.8.3.255

33 Current kWh ToD 4 (Import). Not Specified 1.0.1.8.4.255 34 Current kWh ToD 5 (Import). Not Specified 1.0.1.8.5.255

Instantaneous Profile 1.0.94.91.0.255 1.0.94.91.0.255

Instantaneous Scaler 1.0.94.91.3.255 1.0.94.91.3.255

35 Fundamental Energy kWh Not Specified 1.0.1.8.1.255

36 Current Cumulative kVARh Lag (Import). 1.0.5.8.0.255 1.0.5.8.0.255

37 Current kvarh Lag TOD1 (Import). Not Specified 1.0.8.8.1.255

38 Current kvarh Lag TOD2 (Import). Not Specified 1.0.5.8.2.255 39 Current kvarh – Lag TOD3 (Import). Not Specified 1.0.5.8.3.255

40 Current kvarh – Lag TOD4 (Import). Not Specified 1.0.5.8.4.255

41 Current kvarh – Lag TOD5 (Import). Not Specified 1.0.5.8.5.255

42 Current Cumulative kvarh – Lead (Import). 1.0.8.8.0.255 1.0.8.8.0.255 43 Current kvarh – Lead TOD1 (Import). Not Specified 1.0.8.8.1.255

44 Current kvarh – Lead TOD2 (Import). Not Specified 1.0.8.8.2.255

45 Current kvarh – Lead TOD3 (Import). Not Specified 1.0.8.8.3.255

46 Current kvarh – Lead TOD4 (Import). Not Specified 1.0.8.8.4.255

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47	Current kvarh – Lead TOD5 (Import). Not Specified 1.0.8.8.5.255 48 Current Cumulative kVAh (Import). 1.0.9.8.0.255 1.0.9.8.0.255 49 Current kVAh.TOD1 (Import). Not Specified 1.0.9.8.1.255		
50	Current kVAh.TOD2 (Import).	Not Specified	1.0.9.8.2.255
51	Current kVAh.TOD3 (Import).	Not Specified	1.0.9.8.3.255
52	Current kVAh.TOD4 (Import).	Not Specified	1.0.9.8.4.255
53	Current kVAh.TOD5 (Import).	Not Specified	1.0.9.8.5.255
54	Current MD in KVA with date & time (Import).	Not Specified	1.0.9.6.0.255
55	Current MD in kVA with date & time TOD 1 (Import).	Not Specified	1.0.9.6.1.255
56	Current MD in kVA with date & time TOD 2 (Import).	Not Specified	1.0.9.6.2.255
57	Current MD in kVA with date & time TOD 3 (Import).	Not Specified	1.0.9.6.3.255
58	Current MD in KVA with date & timeTOD4 (Import).	Not Specified	1.0.9.6.4.255

OBIS CODES-IMPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
59	Current MD in KVA with date & timeTOD5 (Import).	Not Specified	1.0.9.6.5.255
60	MD Reset Count.	Not Specified	0.0.0.1.0.255
61	Cumulative MD Total.	Not Specified	1.0.9.2.0.255
62	Phase Sequence	Not Specified	1.0.96.7.30.255
63	Phase Angle 2	Not Specified	1.0.81.7.1.255
64	Phase Angle 3	Not Specified	1.0.81.7.2.255
65	Last Billing Date	0.0.0.1.2.255	0.0.0.1.2.255
66	Load limit function status	0.0.96.31.0.255	0.0.96.31.0.255
67	Load limit value, in kW	0.0.17.0.0.255	0.0.17.0.0.255
68	RF/ GSM signal Strength in milli db		Not Specified
69	No.of Load switch (connect/disconnect) operations		Not Specified

OBIS CODES -IMPORT MODE			
	Billing Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Billing Profile	1.0.98.1.0.255	1.0.98.1.0.255
	Billing Scaler	1.0.94.91.6.255	1.0.94.91.6.255
1	Bill Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255
2	Bill kWh ToD1 (Import).	1.0.1.8.1.255	1.0.1.8.1.255
3	Bill kWh ToD2 (Import).	1.0.1.8.2.255	1.0.1.8.2.255
4	Bill kWh ToD3 (Import).	1.0.1.8.3.255	1.0.1.8.3.255
5	Bill kWh ToD4 (Import).	1.0.1.8.4.255	1.0.1.8.4.255
6	Bill kWh ToD5 (Import).	1.0.1.8.5.255	1.0.1.8.5.255
7	Bill Cumulative kVARh–Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
8	Bill kVARh–Lag.TOD1 (Import).	Not Specified	1.0.5.8.1.255
9	Bill kVARh–Lag.TOD2 (Import).	Not Specified	1.0.5.8.2.255
10	Bill kVARh–Lag.TOD3 (Import).	Not Specified	1.0.5.8.3.255
11	Bill kVARh–Lag.TOD4 (Import).	Not Specified	1.0.5.8.4.255
12	Bill kVARh–Lag.TOD5 (Import).	Not Specified	1.0.5.8.5.255
13	Bill Cumulative kVARh–Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
14	Bill kVARh–Lead.TOD1 (Import).	Not Specified	1.0.8.8.1.255
15	Bill kVARh–Lead.TOD2 (Import).	Not Specified	1.0.8.8.2.255
16	Bill kVARh–Lead.TOD3 (Import).	Not Specified	1.0.8.8.3.255
17	Bill kVARh–Lead.TOD4 (Import).	Not Specified	1.0.8.8.4.255
18	Bill kVARh–Lead.TOD5 (Import).	Not Specified	1.0.8.8.5.255
19	Bill Cumulative kVAh (Import).	1.0.9.8.0.255	1.0.9.8.0.255
20	Bill kVAh TOD1 (Import).	1.0.9.8.1.255	1.0.9.8.1.255
21	Bill kVAh TOD2 (Import).	1.0.9.8.2.255	1.0.9.8.2.255
22	Bill kVAh TOD3 (Import).	1.0.9.8.3.255	1.0.9.8.3.255
23	Bill kVAh TOD4 (Import).	1.0.9.8.4.255	1.0.9.8.4.255
24	Bill kVAh TOD5 (Import).	1.0.9.8.5.255	1.0.9.8.5.255
25	Bill MD in KVA with date & time (Import).	1.0.9.6.0.255	1.0.9.6.0.255
26	Bill MD in kVA with date & time ToD1 (Import).	1.0.9.6.1.255	1.0.9.6.1.255
27	Bill MD in kVA with date & time ToD2 (Import).	1.0.9.6.2.255	1.0.9.6.2.255
28	Bill MD in kVA with date & time ToD3 (Import).	1.0.9.6.3.255	1.0.9.6.3.255
29	Bill MD in kVA with date & time ToD4 (Import).	1.0.9.6.4.255	1.0.9.6.4.255

30	Bill MD in kVA with date & time ToD5 (Import).	1.0.9.6.5.255	1.0.9.6.5.255
31	Bill Power Factor (Import).	1.0.13.0.0.255	1.0.13.0.0.255

OBIS CODES -IMPORT MODE			
Billing Register		**DLMS**	**BEST proposed OBIS Code**
Technical requirements		Profile1.0.98.1.0 .255	1.0.98.1.0.255
		Scaler1.0.94.91. 6.255.	1.0.94.91.6.255
i	Month	0.0.0.1.2.255	0.0.0.1.2.255
ii	ToD wise Cumulative kWh ToD1 (Import).	1.0.1.8.1.255	1.0.1.8.1.255
	ToD2 (Import).	1.0.1.8.2.255	1.0.1.8.2.255
	ToD3 (Import).	1.0.1.8.3.255	1.0.1.8.3.255
	ToD4 (Import).	1.0.1.8.4.255	1.0.1.8.4.255
	ToD5 (Import).	1.0.1.8.5.255	1.0.1.8.5.255
iii	ToD wise Cumulative kVARh Lag ToD1 (Import).	Not Specified	1.0.5.8.1.255
	ToD2 (Import).	Not Specified	1.0.5.8.2.255
	ToD3 (Import).	Not Specified	1.0.5.8.3.255
	ToD4 (Import).	Not Specified	1.0.5.8.4.255
	ToD5 (Import).	Not Specified	1.0.5.8.5.255
iv	ToD wise Cumulative kVARh Lead ToD1 (Import).	Not Specified	1.0.8.8.1.255
	ToD2 (Import).	Not Specified	1.0.8.8.2.255
	ToD3 (Import).	Not Specified	1.0.8.8.3.255
	ToD4 (Import).	Not Specified	1.0.8.8.4.255
	ToD5 (Import).	Not Specified	1.0.8.8.4.255
v	ToD wise Cumulative kVAh ToD1 (Import).	1.0.9.8.1.255	1.0.9.8.1.255
	ToD2 (Import).	1.0.9.8.2.255	1.0.9.8.2.255
	ToD3 (Import).	1.0.9.8.3.255	1.0.9.8.3.255
	ToD4 (Import).	1.0.9.8.4.255	1.0.9.8.4.255
	ToD5 (Import).	1.0.9.8.5.255	1.0.9.8.5.255
vi	ToD wise Power factor ToD1 (Import).	Not Specified	1.0.13.0.1.255
	ToD2 (Import).		1.0.13.0.2.255
	ToD3 (Import).		1.0.13.0.3.255
	ToD4 (Import).		1.0.13.0.4.255

	ToD5 (Import).		1.0.13.0.5.255
vii	ToD wise MD in kVA with date & time ToD1 (Import).	1.0.9.6.1.255	1.0.9.6.1.255
	ToD2 (Import).	1.0.9.6.2.255	1.0.9.6.2.255
	ToD3 (Import).	1.0.9.6.3.255	1.0.9.6.3.255
	ToD4 (Import).	1.0.9.6.4.255	1.0.9.6.4.255
	ToD5 (Import).	1.0.9.6.5.255	1.0.9.6.5.255

OBIS CODES -IMPORT MODE			
Billing Register		**DLMS**	**BEST proposed OBIS Code**
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255	1.0.94.91.6.255
viii	ToD wise MD in kW with date & time ToD1 (Import).	1.0.1.6.1.255	1.0.1.6.1.255
	ToD2 (Import).	1.0.1.6.2.255	1.0.1.6.2.255
	ToD3 (Import).	1.0.1.6.3.255	1.0.1.6.3.255
	ToD4 (Import).	1.0.1.6.4.255	1.0.1.6.4.255
	ToD5 (Import).	1.0.1.6.5.255	1.0.1.6.5.255
ix	Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255
x	Cumulative kVARh – Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
xi	Cumulative kVARh – Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
xii	Cumulative kVAh (Import).	1.0.9.8.0.255	1.0.9.8.0.255
xiii	Average Power Factor (Import).	1.0.13.0.0.255	1.0.13.0.0.255
xiv	Bill MD in Kva with date and time (Import).	1.0.9.6.0.255	1.0.9.6.0.255
xv	Bill MD in Kw with date and time(Import).	1.0.1.6.0.255	1.0.1.6.0.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
1	Instantaneous 3ph kW load. (Export).	1.0.2.7.0.255	1.0.2.7.0.255
2	Instantaneous 3ph kVAr load with lag lead indication (Export)	1.0.4.7.0.255	1.0.4.7.0.255
3	Instantaneous 3ph KVA load (Export).	1.0.10.7.0.255	1.0.10.7.0.255
4	Current Cumulative kWh (Export).	1.0.2.8.0.255	1.0.2.8.0.255
5	Current kWh ToD 1 (Export).	Not Specified	1.0.2.8.1.255

6	Current kWh ToD 2 (Export).	Not Specified	1.0.2.8.2.255
7	Current kWh ToD 3 (Export).	Not Specified	1.0.2.8.3.255
8	Current kWh ToD 4 (Export).	Not Specified	1.0.2.8.4.255
9	Current kWh ToD 5 (Export).	Not Specified	1.0.2.8.5.255
10	Current Cumulative kVARh Lag (Export).	1.0.7.8.0.255	1.0.7.8.0.255
13	Current kvarh Lag TOD1 (Export).	Not Specified	1.0.7.8.1.255
14	Current kvarh Lag TOD2 (Export).	Not Specified	1.0.7.8.2.255
15	Current kvarh – Lag TOD3 (Export).	Not Specified	1.0.7.8.3.255
16	Current kvarh – Lag TOD4 (Export).	Not Specified	1.0.7.8.4.255
17	Current kvarh – Lag TOD5 (Export).	Not Specified	1.0.7.8.5.255
18	Current Cumulative kvarh – Lead (Export).	1.0.6.8.0.255	1.0.6.8.0.255
19	Current kvarh – Lead TOD1 (Export).	Not Specified	1.0.6.8.1.255
20	Current kvarh – Lead TOD2 (Export).	Not Specified	1.0.6.8.2.255
21	Current kvarh – Lead TOD3 (Export).	Not Specified	1.0.6.8.3.255
22	Current kvarh – Lead TOD4 (Export).	Not Specified	1.0.6.8.4.255
23	Current kvarh – Lead TOD5 (Export).	Not Specified	1.0.6.8.5.255
24	Current Cumulative kVAh (Export).	1.0.10.8.0.255	1.0.10.8.0.255
25	Current kVAh.TOD1 (Export).	Not Specified	1.0.10.8.1.255
26	Current kVAh.TOD2 (Export).	Not Specified	1.0.10.8.2.255
27	Current kVAh.TOD3 (Export).	Not Specified	1.0.10.8.3.255
28	Current kVAh.TOD4 (Export).	Not Specified	1.0.10.8.4.255
29	Current kVAh.TOD5 (Export).	Not Specified	1.0.10.8.5.255
30	Current MD in KVA with date & time (Export).	Not Specified	1.0.10.6.0.255
31	Current MD in kVA with date & time TOD 1(Export).	Not Specified	1.0.10.6.1.255
32	Current MD in kVA with date & time TOD 2(Export).	Not Specified	1.0.10.6.2.255
33	Current MD in kVA with date & time TOD 3 (Export).	Not Specified	1.0.10.6.3.255
34	Current MD in KVA with date & timeTOD4(Export).	Not Specified	1.0.10.6.4.255
35	Current MD in KVA with date & timeTOD5(Export).	Not Specified	1.0.10.6.5.255
27	Current kVAh.TOD3 (Export).	Not Specified	1.0.10.8.3.255
28	Current kVAh.TOD4 (Export).	Not Specified	1.0.10.8.4.255
29	Current kVAh.TOD5 (Export).	Not Specified	1.0.10.8.5.255
30	Current MD in KVA with date & time (Export).	Not Specified	1.0.10.6.0.255
31	Current MD in kVA with date & time TOD1 (Export).	Not Specified	1.0.10.6.1.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
Billing Register		**DLMS**	**BEST proposed OBIS Code**
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255.	1.0.94.91.6.255
i	Month	0.0.0.1.2.255	0.0.0.1.2.255

ii	ToD wise Cumulative kWh ToD1 (Export).	1.0.2.8.1.255	1.0.2.8.1.255
	ToD2 (Export).	1.0.2.8.2.255	1.0.2.8.2.255
	ToD3 (Export).	1.0.2.8.3.255	1.0.2.8.3.255
	ToD4 (Export).	1.0.2.8.4.255	1.0.2.8.4.255
	ToD5 (Export).	1.0.2.8.5.255	1.0.2.8.5.255
iii	ToD wise Cumulative kVARh Lag ToD1 (Export).	Not Specified	1.0.7.8.1.255
	ToD2 (Export).	Not Specified	1.0.7.8.2.255
	ToD3 (Export).	Not Specified	1.0.7.8.3.255
	ToD4 (Export).	Not Specified	1.0.7.8.4.255
	ToD5 (Export).	Not Specified	1.0.7.8.5.255
iv	ToD wise Cumulative kVARh Lead ToD1 (Export).	Not Specified	1.0.6.8.1.255
	ToD2 (Export).	Not Specified	1.0.6.8.2.255
	ToD3 (Export).	Not Specified	1.0.6.8.3.255
	ToD4 (Export).	Not Specified	1.0.6.8.4.255
	ToD5 (Export).	Not Specified	1.0.6.8.5.255
v	ToD wise Cumulative kVAh ToD1 (Export).	1.0.10.8.1.255	1.0.10.8.1.255
	ToD2 (Export).	1.0.10.8.2.255	1.0.10.8.2.255
	ToD3 (Export).	1.0.10.8.3.255	1.0.10.8.3.255
	ToD4 (Export).	1.0.10.8.4.255	1.0.10.8.4.255
	ToD5 (Export).	1.0.9.8.5.255	1.0.9.8.5.255
vi	ToD wise Power factor ToD1 (Export).	Not Specified	1.0.13.0.1.255
	ToD2 (Export).		1.0.13.0.2.255
	ToD3 (Export).		1.0.13.0.3.255
	ToD4 (Export).		1.0.13.0.4.255
	ToD5 (Export).		1.0.13.0.5.255
vii	ToD wise MD in kVA with date & time ToD1 (Export).	1.0.10.6.1.255	1.0.10.6.1.255
	ToD2 (Export).	1.0.10.6.2.255	1.0.10.6.2.255
	ToD3 (Export).	1.0.10.6.3.255	1.0.10.6.3.255
	ToD4 (Export).	1.0.10.6.4.255	1.0.10.6.4.255
	ToD5 (Export).	1.0.10.6.5.255	1.0.10.6.5.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE		
Billing Register	**DLMS**	**BEST proposed OBIS Code**
Technical requirements	Profile1.0.98.1.0.255	1.0.98.1.0.255
	Scaler1.0.94.91.6.255	1.0.94.91.6.255

Viii	ToD wise MD in kW with date & time ToD1 (Export).	1.0.2.6.1.255	1.0.2.6.1.255
	ToD2 (Export).	1.0.2.6.2.255	1.0.2.6.2.255
	ToD3 (Export).	1.0.2.6.3.255	1.0.2.6.3.255
	ToD4 (Export).	1.0.2.6.4.255	1.0.2.6.4.255
	ToD5 (Export).	1.0.2.6.5.255	1.0.2.6.5.255
ix	Cumulative kWh (Export).	1.0.2.8.0.255	1.0.2.8.0.255
x	Cumulative kVARh – Lag (Export).	1.0.7.8.0.255	1.0.7.8.0.255
xi	Cumulative kVARh – Lead (Export).	1.0.6.8.0.255	1.0.6.8.0.255
xii	Cumulative kVAh (Export).	1.0.10.8.0.255	1.0.10.8.0.255
xiii	Average Power Factor (Export).	1.0.13.0.0.255	1.0.13.0.0.255
xiv	Bill MD in Kva with date and time (Export).	1.0.10.6.0.255	1.0.10.6.0.255
xv	Bill MD in Kw with date and time (Export).	1.0.2.6.0.255	1.0.2.6.0.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

OBIS Codes

Technical requirements			DLMS	BEST proposed OBIS Code
i	Low/High Voltage- a)Voltage failure, b) Voltage Unbalance, c) Overvoltage d) Under voltage.	Voltage Tamper Profile	0.0.99.98.0.255	0.0.99.98.0.255
		Voltage Tamper Summary Profile	0.0.21.0.5.255	0.0.21.0.5.255
ii	Current Reversal.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
		Current Tamper Summary Profile	0.0.21.0.6.255	0.0.21.0.6.255
iii	Meter Cover Open.	0.0.99.98.5.255	Event ID 251	Event ID 251
iv	Magnetic Defraud Energy.		Not specified	1.0.1.8.0.255
	Magnetic Tamper Event with Date Time	Tamper Event	Event ID201,202	0.0.96.11.4.255
v	Low Current- a) Current Bypass, b) Current Open, c) Over Current.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
vi	Current Unbalance.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
		Current Tamper Summary	0.0.21.0.6.255	0.0.21.0.6.255

OBIS Codes				
Technical requirements			DLMS	BEST proposed OBIS Code
		Profile		
vii	Low Power Factor	Low Power Factor	Event ID 205,206- Low Power Factor.	Event ID 205,206- Low Power Factor.
viii	Additional points.	Cumulative Tamper Count	0.0.94.91.0.255	0.0.94.91.0.255
		No. of Power failure	0.b.99.98.2.255	0.0.96.7.0.255
		Cumulative Duration of Power failure		0.0.94.91.8.255
		Power ON Duration in minutes (bill to bill)		0.0.94.91.13.255

OBIS Codes			
Technical requirements		DLMS	BEST proposed OBIS Code
Events Profile			
Events.	Voltage Tamper Profile	0.0.99.98.0.255	0.0.99.98.0.255
	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
	Power Related Tampers	0.0.99.98.2.255	0.0.99.98.2.255
	Transaction Tamper Profile	0.0.99.98.3.255	0.0.99.98.3.255
	Other Tamper Profiles	0.0.99.98.4.255	0.0.99.98.4.255
	Non Rollover Tamper Profiles	0.0.99.98.5.255	0.0.99.98.5.255
Capture Parameters for Events of Scaler Profile			
Parameters.	Date and Time of event	0.0.1.0.0.255	0.0.1.0.0.255
	Event Code	0.0.96.11.e.255	0.0.96.11.e.255
	Current, IR	1.0.31.7.0.255	1.0.31.7.0.255
	Current, IY	1.0.51.7.0.255	1.0.51.7.0.255
	Current, IB	1.0.71.7.0.255	1.0.71.7.0.255
	Voltage, VRN	1.0.32.7.0.255	1.0.32.7.0.255
	Voltage, VYN	1.0.52.7.0.255	1.0.52.7.0.255
	Voltage, VBN	1.0.72.7.0.255	1.0.72.7.0.255
	Signed power factor, R-Phase	1.0.33.7.0.255	1.0.33.7.0.255
	Signed power factor, Y-Phase	1.0.53.7.0.255	1.0.53.7.0.255
	Signed power factor, B-Phase	1.0.73.7.0.255	1.0.73.7.0.255
	Cumulative Energy kWh	1.0.1.8.0.255	1.0.1.8.0.255
	Cumulative Energy kVAh	1.0.9.8.0.255	1.0.9.8.0.255
Tamper Summary Profile.		Additional Readout profile in IEC62056-62	
1	Voltage Tamper Summary Profile.	0.0.21.0.5.255	0.0.21.0.5.255
2	Current Tamper Summary Profile.	0.0.21.0.6.255	0.0.21.0.6.255
3	Other Tamper Summary Profile.	0.0.21.0.7.255	0.0.21.0.7.255
4	Non Rollover Tamper Summary Profile.	0.0.21.0.8.255	0.0.21.0.8.255
OBIS Codes			

OBIS Codes

Technical requirements		DLMS	BEST proposed OBIS Code
Technical requirements		**DLMS**	**BEST proposed OBIS Code**
Parameters.			
1	Tamper Event ID.	0.0.96.11.e.255	0.0.96.11.e.255
2	Cumulative Tamper Count.	0.0.94.91.0.255	0.0.94.91.0.255
3	Cumulative Tamper Duration.	Not Specified	Not Specified
4	Date & Time of First Occurrence.	1.0.0.9.0.255	1.0.0.9.0.255
5	Date & Time of First restore.	1.0.0.9.1.255	1.0.0.9.1.255
6	Date & Time of Latest Occurrence.	1.0.0.9.2.255	1.0.0.9.2.255
7	Date & Time of Latest Restoration.	1.0.0.9.3.255	1.0.0.9.3.255
ESD.		Event ID 37	Event ID 37
Self Diagnostic Features.	i) RTC Status-BIT 0 (0x01)ii) NVM Status- BIT 1(0x02) iii) RTC Battery-BIT 2(0x04)	Not Specified	1.0.96.5.0.255
General Purpose Parameters:-Profile Code: 0.0.94.91.10.255.			
1	Meter Serial Number.	0.0.96.1.0.255	0.0.96.1.0.255
2	Manufacture Name.	0.0.96.1.1.255	0.0.96.1.1.255
3	Firmware version for meter.	1.0.0.2.0.255	1.0.0.2.0.255
4	Meter Type.	0.0.94.91.9.255	0.0.94.91.9.255
5	Meter year of manufacture.	0.0.96.1.4.255	0.0.96.1.4.255
6	Category.	0.0.94.91.11.255	0.0.94.91.11.255
7	Current Rating.	0.0.94.91.12.255	0.0.94.91.12.255
8	Voltage Rating	1.0.0.6.0.255	1.0.0.6.0.255
9	Accuracy Class	Not Specified	1.0.96.141.0.255
10	Meter Constant	1.0.0.3.0.255	1.0.0.3.0.255
11	Internal CT Ratio.	1.0.0.4.2.255	1.0.0.4.2.255
12	Internal PT Ratio.	1.0.0.4.3.255	1.0.0.4.3.255
Programmable Parameters			
1	Real Time Clock-Date and Time.	0.0.1.0.0.255	0.0.1.0.0.255
2	Demand Integration Period.	1.0.0.8.0.255	1.0.0.8.0.255
3	Profile Capture Period.	1.0.0.8.4.255	1.0.0.8.4.255
4	Single-action Schedule for Billing Dates.	0.0.15.0.0.255	0.0.15.0.0.255
5	Activity Calendar for Time Zones.	0.0.13.0.0.255	0.0.13.0.0.255
6	Image Transfer	0.0.44.0.0.255	0.0.44.0.0.255
7	Load Limit in kW	0.0.17.0.0.255	0.0.17.0.0.255
8	Connect/disconnect	0.0.96.3.10.255	0.0.96.3.10.255
9	Metering Mode	0.0.94.96.19.255	0.0.94.96.19.255
10	Payment Mode	0.0.94.96.20.255	0.0.94.96.20.255
11	Current Association MR (LLS secret change)	0.0.40.0.2.255	0.0.40.0.2.255
12	Current Association US (HLS Key change)	0.0.40.0.3.255	0.0.40.0.3.255

OBIS Codes			
Technical requirements		DLMS	BEST proposed OBIS Code
13	Current Association FW (HLS Key change)	0.0.40.0.5.255	0.0.40.0.5.255
14	Global Key (encryption and authentication)	0.0.43.0.e.255(e=2,3, 4,5)	0.0.43.0.e.255(e=2,3,4,5)
15	Image Activation Single Action Shedule	0.0.15.0.2.255	0.0.15.0.2.255
16	Event Status Word Filter	0.0.94.91.26.255	0.0.94.91.26.255

OBIS Codes			
Technical requirements		DLMS	BEST proposed OBIS Code
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

OBIS Codes			
Load Survey		DLMS (Load Profile OBIS Codes)	BEST proposed OBIS Code
Technical requirements		Profile 1.0.99.1.0.255	1.0.99.1.0.255
		Scaler 1.0.94.91.4.255	1.0.94.91.4.255
1	Voltage of each phase	VRN 1.0.32.27.0.255	VRN 1.0.32.27.0.255
		VYN1.0.52.27.0.255	VYN 1.0.52.27.0.255
		VBN 1.0.72.27.0.255	VBN 1.0.72.27.0.255
2	Current of each phase	IR 1.0.31.27.0.255	IR 1.0.31.27.0.255
		IY 1.0.51.27.0.255	IY 1.0.51.27.0.255
		IB 1.0.71.27.0.255	IB 1.0.71.27.0.255
3	Kwh	1.0.1.29.0.255	1.0.1.29.0.255
4	kVAh	1.0.9.29.0.255	1.0.9.29.0.255
5	Kw	Not Specified	Need not specify. Derived parameter in BCS.
6	Kva	Not Specified	
7	PF	Not Specified	
8	kVarh(lag)	Not Specified	1.0.5.29.0.255
9	kVarh(lead)	Not Specified	1.0.8.29.0.255
10	Real Time Clock Date and Time	0.0.1.0.0.255	0.0.1.0.0.255
Daily Load Profile Parameters			
Profile		Not Specified	1.0.99.2.0.255
Scaler		Not Specified	1.0.94.91.5.255
1	Real Time Clock	Not Specified	0.0.1.0.0.255
2	Cumulative Energy, kWh	Not Specified	1.0.1.8.0.255
3	Cumulative Energy, kVAh	Not Specified	1.0.9.8.0.255
4	Cumulative Reactive Energy lag	Not Specified	1.0.5.8.0.255
5	Cumulative Reactive Energy kVArh Lead	Not Specified	1.0.8.8.0.255
6	Fundamental Energy kWh	Not Specified	1.0.1.8.1.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

Annexure C Three phase CT operated alternating current Smart Meter of Accuracy Class0.5S (DT Meter, LT-CT Meter, etc.)

General Standards Applicable for Meter

Unless otherwise specified elsewhere in this specification, the performance and testing of the meters shall conform to the following standards and amendments/revisions thereof.

Sl. No.	Standard No.	Title
1	IS 16444: Part 2 with latest amendments	AC Static Transformer Operated Watt-hour and VAR-Hour Smart Meters, class 0.2S, 0.5S and 1S
2	CBIP- Publication 325 with latest amendments	Standardization of AC Static Electrical Energy Meters
3	CBIP Technical report no. 111 with latest amendments	Specification for Common Meter Reading Instrument
4	IS:9000 with latest amendments	Basic Environmental Testing Procedures for Electronic & Electrical Items.
5	IS 12063 with latest amendments	Degrees of protection provided by enclosures of electrical equipment.
6	IS 14451, Part-2: 1999 with latest amendments	Telemetering for consumption and demand. Direct digital transfer of meter values.
7	IS 4905: 1999 with latest amendments	Methods for Random sampling.
8	IS 12346 with latest amendments	Specifications for Testing Equipment for AC Energy meter.
9	IS 15959 Part 3 (as applicable) with latest amendments	Data exchange for electricity meter reading, tariff and load control: Companion specification

Communication

Meter shall have ability to communicate with HES on any one of the technologies mentioned in IS 16444 (RF/Cellular) in a secure manner. The selection of communicationtechnology should be as per the site conditions and as per design requirement of the AMISPto meet the Service Level Agreements (SLAs). In case of cellular based meter, the meter shall accommodate SIM Card / e-SIM of any service provider. The meter shall log the removal of the plug-in type communication module removal /nonresponsive event with snapshot.

Other Specifications

Particulars	Specifications
Applicable Standards	The meters shall comply with IS 16444: Part2 for all requirements except for those parameters which have been specifically mentioned to be otherwise in this specification.
Reference Voltage	[As per relevant IS]
Current Rating	Ib
Starting Current	As per IS 16444: Part2
Accuracy	Class 0.5S as per IS 16444: Part 2
Limits of error	As per IS 16444: Part 2
Operating Temperature range	As per IS 16444: Part 2
Humidity	As per IS 16444: Part 2
Frequency	As per IS 16444: Part 2
Influence Quantities	As per IS 16444: Part 2
Power Consumption of meter excluding communication module	As per I S 16444: Part 2
Current and Voltage circuit	As per IS 16444: Part 2
Running at No Load	As per IS 16444: Part 2
Test output device	As per IS 16444: Part 2
Meter Display	As given in the document

Name Plate & marking Meter Display	Manufacturer's name Type designation Number of phases and wires Serial number (Meter serial number shall be laser printed on name plate instead on sticker). Serial number along with barcode Month and Year of manufacture Unit of measurement Reference voltage ,frequency Ref. temperature Rated basic and maximum Current Meter constant (imp/kWh) 'BIS' Mark Class index of meter Property of BEST Undertaking Purchase Order No. & date Guarantee period. Sign of double square Country of manufacture. Firmware version of meter Symbol of load switch. NIC serial NO (Shall be visible from Communication Module

Particulars	Specifications
	Slot) Compatibility of NIC Card.
Time of Use (In case of net-meter both export & import parameters to be measured)	As given in the document
Parameters to be measured	As per IS 16444: Part 2 / IS 15959: Part 3 (as applicable) RF/ GSM signal Strength in milli db to be available in instantaneous parameters. All energies and demand will be available TOD wise in billing/ LS parameters.
Power Quality Information	As per IS 15959: Part 3 (as applicable)
Maximum Demand	As per IS 15959: Part 3 (as applicable)
Load Survey/Interval Data	DIP: 15 min SIP: 15 min LS Days: 45 days
LED/LCD Indicators	As per IS 16444: Part 2
Tamper/Event recording	As given in the document
Alarm	As per IS 16444 / IS 15959: Part 3 (as applicable)
Measuring Elements	a. Current Transformer shall be provided as measuring element in the phase circuit. b. Additional CT/Shunt shall be provided in the neutral circuit of meter to detect phase CT bypass. Any unbalance current of vector summation of all three phase currents, if not recorded as neutral current, to be treated as tamper event, and also current imbalance to be detected. c. The meter shall have CTs with Magnetic shielding and same shall be tested separately prior to assembly. d. The Current Transformers used shall not saturate with passage of DC current as per IS: 13779:1999 with latest amendments.
Anti-Tamper features	The meter shall continue working under tamper conditions as defined in IS 15959 Part 3 and would log the event and send alarm at HES after logging of the defined tamper features as per IS 15959 Part 3. As given in the document
Programmability	As per IS 16444: Part 2
Communication	As per IS 16444: Part 2
Communication Protocol	As per IS 15959: Part 3 (as applicable)
Real time clock (RTC)	As per IS 16444: Part 2 / IS 15959: Part 3 (as applicable)
Data Retention	As per IS 16444: Part 2
Battery Backup	Meter shall be supplied with separate battery backup for RTC.

Data display facility (manual/Auto)	As given in the document
Remote Firmware Upgrade	As per IS 15959: Part 3 (as applicable)
Calibration	Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However parameters like RTC, TOD slots & timings, DIP (billing & load

Particulars	Specifications
	survey), billing date change, Pre paid/post paid, Set metering mode (Import/Export), display setting, shall be reconfigure through CMRI and remotely over the air (OTA), and any other support will be provided without any additional cost to BEST till the useful life of the meters.
Meter Dimension in MM	Is not more than 250L*200W*100H
Software and communication compatibility	The bidder shall supply software required for communication though local (CMRI and BCS software) and remote (AMI) connectivity free of cost and necessary training. For existing meter manufacturer, it should be ensured that all meters (existing non-smart &upcoming smart meters) can be read through one BCS only. The list of OBIS codes for the parameters is provided in the document. There shall be facility to export the data in Excel/txt/csv/PDF and XML format.
KVAH & KVA calculation	Meter shall be programed as Lag+ Lead configuration i.e. Leading PF shall not be considered as unity
Plug-in Communication Module	The Smart Meters shall be have a dedicated sealable slot for accommodating plug-in type bi -directional communication module which shall integrate the respective communication technology (RF Mesh/ Cellular) with the Smart Meters, leading to easy adaptability for network interfaces (WAN/NAN).The Plug-In module shall be field hot swappable/ replaceable. Same NIC shall work with different types of meters of same make (1P, 3P, LTCT, HT etc).
Optical Port	The meter shall have optical port for downloading data. Optical port shall be with a rust resistance coated metal ring to hold magnet of downloading probe. The optical head used for meter reading shall comply with IEC 62056-21 as far as physical construction is concerned. 10 Nos. of optical chords shall be provided for downloading the data from Meter to PC using BCS software in the Lab. The Optical Port provided on meter shall have flap & sealing provision.
Internal component specification	AS given in the document

Data display facility (auto/manual)

Meter shall have at least three display modes for showing display parameters. Auto mode shall be as Default in which parameters will scroll at the interval of 10 seconds. Minimum 7 digit integers for energy parameters shall be provided.

1 Auto Mode:

c) The offered meter shall be capable of recording and displaying following readings in Auto mode display. The display shall follow the following sequence as mentioned below in interval of 10 seconds automatically.

d) Minimum 7-digit integers for energy parameters shall be provided.

Sequence	Display
1	Complete LCD Test.
2	Meter Number.
3	Present Time.
4	Present Date.
5	Current kWh.
6	Current kWh for ToD 1
7	Current kWh for ToD 2
8	Current kWh for ToD 3
9	Current kWh for ToD 4
10	Current kWh for ToD 5
11	Current kVAh.
12	Current kVAh for ToD 1
13	Current kVAh for ToD 2
14	Current kVAh for ToD 3
15	Current kVAh for ToD 4
16	Current kVAh for ToD 5
17	Current Total kVARh lag.
18	Current Total kVARh lead.
19	Current Max MD in kVA with date and time for ToD 1
20	Current Max MD in kVA with date and time for ToD 2
21	Current Max MD in kVA with date and time for ToD 3
22	Current Max MD in kVA with date and time for ToD 4
23	Current Max MD in kVA with date and time for ToD 5
24	Instantaneous Power Factor.
25	Instantaneous R ph Voltage.
26	Instantaneous Y ph Voltage.
27	Instantaneous B ph Voltage.
28	Instantaneous R ph Current.
29	Instantaneous Y ph Current.
30	Instantaneous B ph Current.
31	Neutral Current.
32	Instantaneous kW load.
33	Instantaneous kVAr load.
34	Instantaneous KVA load.
35	Instantaneous Frequency.

After last sequence, the first sequence shall be automatically displayed.

2 Push Button Mode:-

Following parameters shall be displayed on pressing the button. (Scroll up & down) :-

Sequence	Display
1	Segment Check Display (LCD Test)
2	BEST Meter Serial Number.
3	Real Time
4	Real Date
5	Bill kWh
6	Bill kWh for ToD 1
7	Bill kWh for ToD 2
8	Bill kWh for ToD 3
9	Bill kWh for ToD 4
10	Bill kWh for ToD 5

Sequence	Display
11	Bill kVAh.
12	Bill kVAh for ToD 1
13	Bill kVAh for ToD 2
14	Bill kVAh for ToD 3
15	Bill kVAh for ToD 4
16	Bill kVAh for ToD 5
17	Bill kVARh–Lag.
18	Bill kVARh–Lead.
19	Bill MD in kVA with date and time for TOD1
20	Bill MD in kVA with date and time for TOD2
21	Bill MD in kVA with date and time for TOD3.
22	Bill MD in kVA with date and time for TOD4
23	Bill MD in kVA with date and time for TOD5.
24	Bill Average Power Factor.
25	Cumulative MD Total.
26	Cumulative MD in kVA with date and time for TOD1
27	Cumulative MD in kVA with date and time for TOD2.
28	Cumulative MD in kVA with date and time for TOD 3
29	Cumulative MD in kVA with date and time for TOD 4
30	Cumulative MD in kVA with date and time for TOD 5.
31	MD Reset Count.
44	Last Magnetic Tamper event date and time.
45	Current MD in kVA with date and time.

Meter Display Sequence of NET SMART METER

1 **Auto Mode:-**

Sequence	Display
1	Complete LCD Test
2	BEST Meter Serial Number.
3	Present Date
4	Present Time
5	Current CKWh Reading (Import)
6	Current CKVAh Reading while Active (Import)
7	Current CRKVAh Reading Lag (Import)
8	Current CRKVAh Reading Lead (Import)
9	Current KWh Reading for TOD1 (Import)
10	Current KWh Reading for TOD2 (Import)
11	Current KWh Reading for TOD3 (Import)
12	Current KWh Reading for TOD4 (Import)
13	Current KWh Reading for TOD5 (Import)
14	Current KVAh Reading for TOD1 (Import)
15	Current KVAh Reading for TOD 2 (Import)
16	Current KVAh Reading for TOD 3 (Import)
17	Current KVAh Reading for TOD 4 (Import)
18	Current KVAh Reading for TOD 5 (Import)
19	Current Maximum Demand with date and time in KVA of Billing Period for TOD1 (Import)
20	Current Maximum Demand with date and time in KVA of Billing Period for TOD 2(Import)
21	Current Maximum Demand with date and time in KVA of Billing Period for TOD3 (Import)
22	Current Maximum Demand with date and time in KVA of Billing Period for TOD 4 (Import)
23	Current Maximum Demand with date and time in KVA of Billing Period for TOD5 (Import)
24	Current CKWh Reading (Export)
25	Current CKVAh Reading while Active (Export)
26	Current CRKVAh Reading Lag (Export).
27	Current CRKVAh Reading Lead (Export).
28	Current KWh Reading for TOD1 (Export)
29	Current KWh Reading for TOD2 (Export)
30	Current KWh Reading for TOD3 (Export)
31	Current KWh Reading for TOD4 (Export)
32	Current KWh Reading for TOD5 (Export)
33	Current KVAh Reading for TOD1 (Export)
34	Current KVAh Reading for TOD 2 (Export)

35	Current KVAh Reading for TOD 3 (Export)
36	Current KVAh Reading for TOD 4 (Export)
37	Current KVAh Reading for TOD 5 (Export)
38	Current Maximum Demand with date and time in KVA of Billing Period for TOD1 (Export)
39	Current Maximum Demand with date and time in KVA of Billing Period for TOD 2(Export)
40	Current Maximum Demand with date and time in KVA of Billing Period for TOD3 (Export)
41	Current Maximum Demand with date and time in KVA of Billing Period for TOD 4 (Export)
42	Current Maximum Demand with date and time in KVA of Billing Period for TOD5 (Export)
43	Instantaneous Power Factor
44	Instantaneous R ph Voltage.
45	Instantaneous Y ph Voltage
46	Instantaneous B ph Voltage.
47	Instantaneous R ph Current.
48	Instantaneous Y ph Current
49	Instantaneous B ph Current.
50	Neutral Current.
51	Instantaneous Active kW load. (Import/Export)
52	Instantaneous Apparent kVA load. (Import/Export)
53	Instantaneous Reactive KVAr load. (Import/Export)
54	Instantaneous Frequency.

Push Button Mode:-

Sequence	Display
1	Complete LCD Test
2	BEST Meter Serial Number.
3	Present Date
4	Present Time
5	Cumulative KWh Reading at Bill Point (Import)
6	Cumulative KVAh Reading at Bill Point (Import)
7	Cumulative RKVAh Reading Lag at Bill Point (Import)
8	Cumulative RKVAh Reading Lead at Bill Point (Import)

Sequence	Display
9	Cumulative KWh Reading for TOD1 at Bill Point (Import)
10	Cumulative KWh Reading for TOD 2 at Bill Point (Import)
11	Cumulative KWh Reading for TOD 3 at Bill Point (Import)
12	Cumulative KWh Reading for TOD 4 at Bill Point (Import)
13	Cumulative KWh Reading for TOD 5 at Bill Point (Import)

14	Cumulative KVAh Reading for TOD1 at Bill Point (Import)
15	Cumulative KVAh Reading for TOD2 at Bill Point (Import)
16	Cumulative KVAh Reading for TOD3 at Bill Point (Import)
17	Cumulative KVAh Reading for TOD 4 at Bill Point (Import)
18	Cumulative KVAh Reading for TOD 5 at Bill Point (Import)
19	Maximum Demand in KVA with date and time of Billing Period for TOD1 (Import).
20	Maximum Demand in KVA with date and time of Billing Period for TOD2 (Import).
21	Maximum Demand in KVA with date and time of Billing Period for TOD3 (Import).
22	Maximum Demand in KVA with date and time of Billing Period for TOD4 (Import).
23	Maximum Demand in KVA with date and time of Billing Period for TOD5 (Import).
24	Bill Average Power Factor (I).
25	Cumulative KWh Reading at Bill Point (Export).
26	Cumulative KVAh Reading at Bill Point (Export)
27	Cumulative RKVAh Reading Lag at Bill Point (Export)
28	Cumulative RKVAh Reading Lead at Bill Point (Export)
29	Cumulative KWh Reading for TOD1 at Bill Point (Export)
30	Cumulative KWh Reading for TOD 2 at Bill Point (Export)
31	Cumulative KWh Reading for TOD 3 at Bill Point (Export)
32	Cumulative KWh Reading for TOD 4 at Bill Point (Export)
33	Cumulative KWh Reading for TOD 5 at Bill Point (Export)
34	Cumulative KVAh Reading for TOD1 at Bill Point (Export)
35	Cumulative KVAh Reading for TOD2 at Bill Point (Export)
36	Cumulative KVAh Reading for TOD3 at Bill Point (Export)
37	Cumulative KVAh Reading for TOD 4 at Bill Point (Export)
38	Cumulative KVAh Reading for TOD 5 at Bill Point (Export)
39	Maximum Demand in KVA with date and time of Billing Period for TOD1 (Export).
40	Maximum Demand in KVA with date and time of Billing Period for TOD2 (Export).
41	Maximum Demand in KVA with date and time of Billing Period for TOD3 (Export).
42	Maximum Demand in KVA with date and time of Billing Period for TOD4 (Export).
43	Maximum Demand in KVA with date and time of Billing Period for TOD5 (Export).
44	Bill Average Power Factor (E).
45	MD Reset Count.

1) The Auto mode (default display) shall switch to Push button mode display (On Demand Display Mode) after pressing the push button.

2) The Push Button display mode shall switch over to Auto mode display (default display) if the push button is not operated for 15 seconds.

3) Display of MD (kVA or kW) shall have 3-digit integer and 3 digit decimal and display of cumulative MD shall have 4-digit integer and 3 digit decimal.

4) Instantaneous values of lead Power Factor shall be shown with negative sign while lag PF shall be shown without sign on the display

High Resolution Mode

Following parameters shall be displayed in High Resolution Mode with 3 digit integer +4 digit decimals.

Sequence	Display
1	KWh Reading (Import).
2	RKVAh Reading Lag (Import).
3	RKVAh Reading Lead (Import).
4	KWh Reading (Export).
5	RKVAh Reading Lag (Export).
6	RKVAh Reading Lead (Export).
7	KVAh Reading (Import).
8	KVAh Reading (Export).

1) The Auto mode display (default display) shall switch to High Resolution Display Mode after pressing the push button continuously for 10 seconds.

2) The High Resolution Display Mode shall switch over to Auto mode (default display) if the push button is not operated for 60 seconds

Meter display should not go in to sleep mode during Power-On condition in case the push button is notoperated for more than 10 minutes. **TOD Feature:**

The meter shall be capable of measuring Cumulative Energy (KWh), KVarh Lag, Kvarh Lead, Kvah and MD (KW, KVA)with time of day (TOD) registers having 5 zones (no. of zones & time slot shall be programmable by CMRI with adequate security level).
TOD Slot Configuration shall be as follows-

Slot	Time Slots
TOD 1	22 to 06 Hrs
TOD 2	06 to 09 Hrs
TOD 3	09 to 12 Hrs
TOD 4	12 to 18 Hrs.
TOD 5	18 to 22 Hrs

Immunity against external influencing signals:

Magnetic Field:

Meter shall record accurate energy in case of any external influencing signals in line with IS 13779:1999 Cl.11.2 and variation in limits of error (upto 100% Imax) shall be as per the table 13 of IS 14697. Meter shall be immune to magnetic field such that it shall not affect the normal overall functionality However, in case of abnormal magnetic field as defined below meter shall perform as per the following features:

c) Meter shall log the event in its memory as" MAGNET" with date and time stamp within 30 sec or immediate of application of abnormal magnetic field and shall start recording at 100% Imax and after removal of magnet, back to normal recording within 30 sec or immediate.

d) Meter shall show "Magnet" in the display.

Abnormal Magnetic field is defined as below;

d) Continuous DC magnetic induction: >0.20 Tesla ± 5%(Value of the magneto motive force to be applied shall be generally >10000 ATs, Should be immune up to 0.20Tesla)
e) AC magnetic induction: Immune for 10 milli Tesla (if produced with circular metal core with square cross section as specified in CBIP latest report with 2800 AT
f) Permanent Magnet: Immune up to 0.5T and Event logging >0.5T

Electrostatic Discharge (ESD)

Meter shall be immune up to 50 kV and shall record accurate energy as per IS-13779:1999.Meter shall log the event into memory as 'ESD' with date & time stamp for any ESD greater than 50 kV and shall show 'ESD' in the display.
The shielding around the meter shall be such that it does not get affected by high voltage, high and low energy impulse when comes in contact with meter from any side.
The meter should immune to high/ low frequency Jammer devices. Meter shall log event in its memory as jammer with date and time stamp along with snapshot.
The meter should be immune and log the tamper on application of any other higher magnetic field of any frequency waves, micro waves

Neutral Disturbance

The meter shall log in the memory as 'NEUTRAL DISTURBANCE' with date and time stamp and show 'ND' in the display for Frequency variation below 45 Hz and above 55 Hz with time delay of 2 min and for Pulsating DC and Chopped AC of any value with time delay of 2 min.

The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of DC signal/ DC pulse upto 330V and for any value beyond this, the meter shall log the event into memory as 'NEUTRAL DISTURBANCE' with date & time stamp and shall show 'ND 'in the display after time delay of 2 min(occurrences and restoration time).

The meter shall record energy proportional to the current and V Ref when any of the tamper circuits are used to tamper energy using a diode or a variable resistance or a variable capacitance energy saving device. The measurement by meter shall not get influenced by injection of AC Voltages/Chopped signal/DC signal/ DC pulse of low frequency and harmonics. The meter should be immune to such Neutral Disturbance. In case the meter accuracy is disturbed under Neutral Disturbance, it should be able to log the event.

Abnormal and Tamper conditions

The meter shall record forward energy under any abnormal conditions.
All the tamper events i.e. shall be logged in the memory of the meter with date and time stamp of occurrence and restoration along with instantaneous electrical parameter (Voltage, Current (phase and neutral) , energy, PF , frequency)

Meter shall store cumulative count and cumulative durations all the tamper event which have logged by meter from the date of energization till life of meter.

Tamper count shall be incremented only on the occurrence of the any tamper event with date and time Stamp on FIFO basis. The event which is not restored should not be removed from its meter memory and FIFO should not applicable for unrestored event.
The cover open tamper detection should be through heavy duty, sturdy micro switch such that it should not Operate on vibration or impact during handling or testing.
The meter shall register correctly if supply neutral is not available at the meter neutral terminal. The meter shall work in absence of two incoming wires. It shall keep recording correctly in case of unbalance system voltage.

The meter shall keep working accurately irrespective of the phase sequence of the supply.

The meter shall be able to differentiate between actual CT reversals and condition arising out of unbalanced / unhealthy capacitor bank.
During Voltage Failure event, the meter shall record energy proportional to the current and V Ref (240V).
Meter shall have neutral CT for tamper identification and analysis.
The event compartments shall be IS 15959 Part-1 table 9. The size of compartments should be such that all above event are accommodated in the assigned event compartment. i.e. if in case of voltage compartment assigned to 4 number of events then the minimum size of this compartment should be such that it should accommodate sum of all maximum number of events as per below table. Transaction event compartment size shall be minimum 100 events

Persistence time for occurrence and restoration for the events and compartment block size shall be as per table given below

Sr. No.	Tampers/ Failures	Phase wise	Compartment Size	Logic/ Condition other than standard	Persistence time	
					Occ Time (min)	Rec Time (min)
1	Voltage Failure	YES	25	Occ: Voltage <192V: and current > 2% Ib. Res: Vph > 191V (Independent of current)	5	5
2	Voltage unbalance	YES	25	Occ : (Vmax-Vph)>10% Vn and Vphase : 191>Vphase< 216 Res : (Vmax-Vph)<10% Vn and Vphase : 191<Vphase> 216	5	5
3	High Voltage	YES	25	Vph > 110% of Vref	30	30
4	CT open	YES	25	Occ: Ir+Iy+Ib+In>10% of Ib(vector Sum) and phase current<10% Ib with all current are positive Res: Ir+Iy+Ib+In<5% of Ib(vector Sum) and phase current>10% Ib with all current are positive	30	30
5	Current unbalance	YES	25	Occ : Imax – Imin > 30% of Iavg Res : Imax – Imin < 30% of Iavg	15	15
6	CT Bypass	YES	25	Occ: Ir+Iy+Ib+In>5% of Ib(vector Sum) and phase current>10% Ib with all current are positive Res: Ir+Iy+Ib+In>2.5% of Ib(vector Sum) and phase current<10% Ib with all current are positive	30	30

7	Current reversal	YES	25	1. Active current negative 2. PF > 0.3	2	2
8	Magnet	NO	25	Whenever meter sense magnetic field it shall record Active and Apparent energy at Imax at UPF	Immediate	Immediate
9	Neutral Disturbance	NO	25	Vph > 150% Vref	5	5

				In case of external signal injection (Chopped DC, Chopped AC and DC injection through diode)		
10	ESD/JAMMER	NO	25	Occ: Immunity upto 50 KV, > 50KV event logged In memory Res: Removal of ESD and Jammer Device	2	2
11	Low PF Tamper	YES	25	OCC: PF < +/- 0.5 and I>1%Ib REC: PF > +/- 0.7 and I>1%Ib	5	5
12	Top Cover open	NO	1	When cover opens by more than 2 to 4 mm.	Immediate	NA
13	Temperature Rise	NO	25	Occ: T >70˚C REC: T <60˚C	2	2
14	NIC card Removed (Immediate)	NO	25	OCC: On removal of card RES: On Inserction card	Immediate	Immediate
15	Power On/Off	NO	25	Occ: Actual voltage OFF Res: Actual voltage ON	5	5

In case of Bi-directional meters current reversal and magnet tamper conditions to be made accordingly.

Anti-tamper features

The meter shall continue recording energy under tamper conditions as defined in IS 15959 Part 2 and would log the event and send alarm at Head End System after detection of the defined tamper features as per IS 15959 Part 2.

Type Tests & Test Certificates

Smart Meter shall be type tested for tests as per relevant parts of IS 16444 (latest versions), and certified by Indian Standard wise list of BIS recognized labs as available at https://bis.gov.in/index.php/laboratorys/list-of-bis-recognized-lab/. The number of sampling for testing of meters and criteria for conformity would be as per IS 16444(as amended up to date). Necessary copies of test certificates shall be submitted as per agreement with the Utility/AMI-IA.

Routine & Acceptance Tests

The Factory Acceptance and Routine tests shall be carried out as per IS 16444 Part 1.

General & Constructional requirements

Meter shall be BIS marked as per IS 16444 Part 1. General & construction requirement shall be as per IS 16444/IS 13779

Meter base & cover - Meter base & cover shall be as per IS 16444 Part1 / IS 13779. The meter Base & cover shall be Encapsulated type with “screwless break to open” design conform to the degree of protection IP 54 against ingress of dust, moisture and vermin. ‘Break to open’ design. The material for meter base and cover shall be made of high-grade polycarbonate.

The meter Base & cover shall be ultrasonically welded / Chemically welded or other suitable bonding technology and it will not be possible to remove the cover from the base without evidence of damage and necessary sealing provision shall be provided on the both sides of the meter.

Terminal block & cover - As per IS 16444 Part 1/IS 13779

The terminal cover shall be transparent and short. The terminal cover shall be fully enclosed type. The connection diagram shall be marked on Terminal Block cover.

Design

Voltage circuit, sealing arrangement, terminal block, terminal cover and nameplate etc. shall be in accordance with IS-16444 Part 1 (latest version). The meter shall be compact and reliable in design, easy to transport and immune to vibration and shock involved in transportation and handling

Name plate and marking

The meter should bear a name plate clearly visible, effectively secured against removal and indelibly/distinctly marked in accordance with relevant IS. In addition, "Name of the Utility/AMI- IA", purchase order no. & year/month of manufacturing shall be provided on the meter name plate. The rating plate information shall be as per relevant IS.

Connection diagram: As per IS 16444 Part 1

Fixing arrangements:

The meter shall be mounted type. The Meter should have three fixing holes, one at top and two at the bottom. The Top hole should be such that the holding screw is not accessible to the consumer after fixing the meters. The lower screws should be provided under sealable terminal cover. The requisite fixing screws shall be supplied with each meter.

Sealing arrangement:

Arrangements shall be provided for proper sealing of the meter cover so that access to the working parts shall not be possible without breaking the seal. The sealing arrangement and number of seals shall be as per relevant IS/ requirement of Utility/AMI-IA.

The sealing point shall be as per CEA regulation 2006 with latest amendments. Supplier shall fix tamper evident barcoded holographic seal on left side of the meter. It shall not be possible to remove the seal intact. Details of holographic seals used by supplier shall be provided in hard as well as in soft copy on CD/email as per format given by BEST. Additional seals will be provided by BEST to supplier for putting them on meter body as per requirement.

Meter box:

The Meter Box if required by Utility/AMI-IA/purchaser, would be provided as per requirement of the Utility/AMI-IA/ purchaser and the material of the Meter Box should be such that it does not hamper communications.

Packing

- The meters shall be suitably packed for vertical/horizontal support to withstand handling during transportation.
- The meter shall be packed appropriately to ensure safe transportation, handling, identification and storage.
- All packing materials shall be as per environment law in force. The primary packing shall ensure protection against humidity, dust, grease and safeguard the meter's performance until its installation.
- The secondary packing shall provide protection during transportation.
- The packing case shall indicate "Fragile in nature" and direction of placement of box.
- The packing shall indicate marking details like Manufacturer's name, meters #s, quantity, etc.

Transportation

- The meter shall be compact in design. The meter block unit shall be capable of withstanding stresses likely to occur in actual service and rough handling during transportation.
- The meter shall be convenient to transport and immune to shock and vibration during transportation and handling.

- The meter should not be exposed to undue shock and mishandling during transportation.
- The stacking of box inside transport media should be such as to avoid their free movement.
- The packing should also be protected from rain and dust by transport media.
- The AMISP shall be responsible for any damage during transit due to inadequate or improper packing.

Testing and Manufacturing Facilities at Manufacturer's Place

The manufacturer shall have facilities of conducting Acceptance Testing as per IS 16444 Part 1.

Inspection

- The meters shall be sealed as per the mutual agreement of the supplier and the purchaser
- The Utility/AMI-IA/ purchaser may inspect the meter randomly as per sampling plan for acceptance testas per IS 16444 Part 1. The meters shall be tested for acceptance test as per IS 16444 Part 1
- All meters are factory tested at manufacturer's work place and RTR (Routine Test Report) to be submitted to BEST for each meters in soft copy before dispatch of meters.

Tender sample

- Tenderer shall submit 3 sample meters out of which one sample meter shall be without Ultrasonic welding to confirm constructional features and other destructive tests if any.
- After successful passing the tests carried out at BEST laboratory the tenderer shall give the demonstration of the meter offered against the tender to demonstrate the features incorporated in the meter.
- Sample meter submitted against the tender will not be returned to the supplier till the completion of guarantee period.

Guarantee.

- 7.5 years from the date of dispatch or 7 year from date of commissioning, whichever is earlier
- Manufacturer shall undertake a guarantee to replace meter up to a period of 7 Year from the date of supply. The meters which are found defective/inoperative within the guarantee period shall be replaced as per meter service level agreement.

Internal component specification

Sr No	Component	Requirement	Preferable Makes and Origin
1	Measurement or Computing Chips.	The measurement or computing chips used in the meter shall be with the Surface mount type along with Application Specific Integrated Circuits (ASIC).	USA: Analog Devices, Cyrus Logic, Atmel, Philips, Teridian, Dallas, ST, Texas Instruments, Motorola, Maxim, National Semiconductors, Freescale, On semiconductors. Germany: Siemens. South Africa: SAMES. Japan: NEC, Toshiba, Renasas, Hitachi. Austria: AMS. Holland: Philips (NXP).

Sr No	Component	Requirement	Preferable Makes and Origin
2	Memory Chips.	The memory chips shall not be affected by external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel,Teridian, National Semiconductors, Philips, Texas Instruments, ST, Microchip, Spanson (Fujitsu), Ramtron. Japan: Hitachi, Renasas, Oki. Germany: Siemens.
		Meter shall have Non-Volatile Memory (NVM) to store energy meter data.	
		NVM shall be external (Outside ASIC).	
		In case of input power fail to Energy Meter it shall record last sampled important data in EEPROM using capacitance tank of power supply. Use of Non- rechargeable battery should only be restricted to minimum absolute power requirement of meter. Non-rechargeable battery shall not be used for this function.	
3	Display Modules.	The display modules shall be well protected from the external Ultra Violet (UV) radiations.	Display Make:- Singapore: E-smart, Bonafied Technologies, Display Tech. Korea: Advantek, Jebon, Union Display Inc. Japan: Hitachi, Sony, L&G. Malaysia: Crystal ClearTechnology Holland/Korea: Phillips. Hongkong: Genda. China: Tianma, JIA.
		The display visibility shall be sufficient to read the meter mounted at height of 0.5 meter as well as at the height of 2 meters.	
		The construction of the modules should be such that the displayed quantity shall not disturbed with the life of display (PIN Type).	
		It shall be trans reflective STN (STN – Super Twisted Nematic (160°) type industrial grade with extended temperature range.	
4	Optical Port.	Optical port shall be used to transfer the meter data to Common Meter Reading Instrument (CMRI/ DCU). The mechanical construction of the port shall be such to facilitate the data transfer easily.	USA: National Semiconductors, HP, Optonica, ST. Holland/Korea: Phillips. Japan: Hitachi. Taiwan: Ligitek. Osram, Everlight, Liteon, Avego.

Sr No	Component	Requirement	Preferable Makes and Origin

5	Electronic Components .	The active and passive components shall be of the surface mount type and are to be handled and soldered by the state of art assembly processes.	USA: National Semiconductors, Atmel, Philips, Texas Instruments, BC Component, Analog devices, ST, Maxim, Kemet, On semiconductors, Freescale, Intersil, Raltron, Fairchild, Muruta, Agilent, AVX, Abracon, Sipex, Diode Inc., Honeywell, Power Integration, Fox, Roham, Onsemi. Japan: Hitachi, Oki, AVZ or Ricoh, Toshiba, Epson, Kemet, Alps, Muruta, TDK, Sanyo, Samsung, Panasonic. Korea: Samsung. India: Keltron, Incap, VEPL, PEC, RMC, Gujarat Polyavx, Prismatic, MFR Electronic components Pvt. Ltd, Cermet. Germany: Vishay, Epcos, Diotech, Kemet.
		The Plated Through Hole (PTH) component should be positioned such a way that the leads of the component shall not be under stress and not touching the internal wires.	
6	Battery.	Non rechargeable Lithium battery with guaranteed life of about 10 years shall be used.	Varta, Tedirun, Sanyo or National, Panasonic, Tekcell, Vitzrocell, Mitsubishi.
		Battery for RTC and for Meter Display in absence of Power shallbe Separate.	
7	RTC.	The accuracy of RTC shall be as per relevant IEC/IS standards.	USA: Philips, Dallas Atmel, Motorola, Microchip, Maxell, Renata Japan: NEC or Oki.
8	Measuring Element.	Measuring elements used shall be as per Clause No. 8.11 of the specification.	
9	Power Supply.	The power supply shall be with the capabilities as per the relevant standards.	
		The power supply unit of the meter shall not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	
		The ratings of Power Supply module and power consumed by various modules and circuits shall be specified.	
		The power supply shall be at least 125% rated than the maximum load on the power supply.	
		In case of capacitive power supply, the voltage rating of series power circuit capacitor shall be adequate to withstand 440V AC applied at meter terminals continuously for 5 minutes without damage.	
		All the electrolytic capacitors shall have preferably low ESR value.	
10	Electrical Components.	The internal electrical component shall be of electrolytic copper & shall be protected from	
Sr No	**Component**	**Requirement**	**Preferable Makes and Origin**

		corrosion, rust etc.	
11	Mechanical Parts.	The other mechanical components shall be protected from corrosion etc. by suitable plating/painting methods.	
12	P.C.B.	Glass Epoxy, fire resistance grade FR4 with adequate strength.	
		PCB shall be Bare Board Test (BBT) certified.	
		The meter shall preferably with minimum jumper/wires/connectors.	
		PCB shall be suitably masked with protection coating.	
13	Push Button.	Carbon pill and silicon rubber contact / Tactile/ captive push button type high performance push buttons shall be used.	
14	Magnetic Tamper Detection Sensor.	Hall Effect IC/Inductor Sensor shall be used.	Make-Diode, Allegro etc.

Note:

i) The tenderer shall submit soft / hard copy of data / information sheets of all meter parts/ components.
ii) In case purchase order is placed bills of material shall be shown at pre dispatch inspection at factory works. iii)Manufacturing process should be preferably automated and tenderer shall list out activities wherein human intervention is required for assembling/testing of meters. For such activities tenderer shall declare quality standard adopted for carrying out such skilled job.

OBIS Code-

OBIS CODES-IMPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
1	Instantaneous R ph Voltage.	1.0.32.7.0.255	1.0.32.7.0.255
2	Instantaneous Y ph Voltage.	1.0.52.7.0.255	1.0.52.7.0.255
3	Instantaneous B ph Voltage.	1.0.72.7.0.255	1.0.72.7.0.255
4	Instantaneous R ph Current.	1.0.31.7.0.255	1.0.31.7.0.255
5	Instantaneous Y ph Current.	1.0.51.7.0.255	1.0.51.7.0.255
6	Instantaneous B ph Current.	1.0.71.7.0.255	1.0.71.7.0.255
7	Instantaneous Power Factor.	1.0.13.7.0.255	1.0.13.7.0.255
8	THD R ph Voltage	1.0.32.7.124.255	1.0.32.7.124.255
9	THD Y ph Voltage	1.0.52.7.124.255	1.0.52.7.124.255
10	THD B ph Voltage	1.0.72.7.124.255	1.0.72.7.124.255
11	THD R ph Current.	1.0.31.7.124.255	1.0.31.7.124.255
12	THD Y ph Current.	1.0.51.7.124.255	1.0.51.7.124.255

13	THD B ph Current.	1.0.71.7.124.255	1.0.71.7.124.255
14	Displacement Power Factor.	Not Specified	Not Specified

		DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
15	Instantaneous 3ph kW load (Import).	1.0.1.7.0.255	1.0.1.7.0.255
16	Instantaneous 3ph kVAr load with lag lead indication (Import).	1.0.3.7.0.255	1.0.3.7.0.255
17	Instantaneous 3ph KVA load (Import).	1.0.9.7.0.255	1.0.9.7.0.255
18	THD Active Power R ph	1.0.35.7.124.255	1.0.35.7.124.255
19	THD Active Power Y ph	1.0.55.7.124.255	1.0.55.7.124.255
20	THD Active Power B ph	1.0.75.7.124.255	1.0.75.7.124.255
21	Active Power Total R ph	1.0.21.7.0.255	1.0.21.7.0.255
22	Active Power Total Y ph	1.0.41.7.0.255	1.0.41.7.0.255
23	Active Power Total B ph	1.0.61.7.0.255	1.0.61.7.0.255
24	Active Power Fundamental R ph	1.0.130.7.0.255	1.0.130.7.0.255
25	Active Power Fundamental Y ph	1.0.131.7.0.255	1.0.131.7.0.255
26	Active Power Fundamental B ph	1.0.132.7.0.255	1.0.132.7.0.255
27	Instantaneous Frequency.	1.0.14.7.0.255	1.0.14.7.0.255
28	Real Time Clock – Date and Time	0.0.1.0.0.255	0.0.1.0.0.255
29	Current Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255
30	Current kWh ToD 1 (Import).	Not Specified	1.0.1.8.1.255
31	Current kWh ToD 2 (Import).	Not Specified	1.0.1.8.2.255
32	Current kWh ToD 3 (Import).	Not Specified	1.0.1.8.3.255
33	Current kWh ToD 4 (Import).	Not Specified	1.0.1.8.4.255
34	Current kWh ToD 5 (Import).	Not Specified	1.0.1.8.5.255

OBIS CODES -IMPORT MODE

	Instantaneous Profile Parameters	DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
35	Fundamental Energy kWh.	Not Specified	1.0.1.8.1.255
36	Current Cumulative kVARh Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
37	Current kvarh Lag TOD1 (Import).	Not Specified	1.0.8.8.1.255
38	Current kvarh Lag TOD2 (Import).	Not Specified	1.0.5.8.2.255
39	Current kvarh – Lag TOD3 (Import).	Not Specified	1.0.5.8.3.255
40	Current kvarh – Lag TOD4 (Import).	Not Specified	1.0.5.8.4.255
41	Current kvarh – Lag TOD5 (Import).	Not Specified	1.0.5.8.5.255
42	Current Cumulative kvarh – Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
43	Current kvarh – Lead TOD1 (Import).	Not Specified	1.0.8.8.1.255
44	Current kvarh – Lead TOD2 (Import).	Not Specified	1.0.8.8.2.255
45	Current kvarh – Lead TOD3 (Import).	Not Specified	1.0.8.8.3.255

46 Current kvarh – Lead TOD4 (Import). Not Specified 1.0.8.8.4.255

47 Current kvarh – Lead TOD5 (Import). Not Specified 1.0.8.8.5.255

48 Current Cumulative kVAh (Import). 1.0.9.8.0.255 1.0.9.8.0.255 49 Current kVAh.TOD1 (Import). Not Specified 1.0.9.8.1.255

Instantaneous Profile Parameters			
		DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255

50	Current kVAh.TOD2 (Import).	Not Specified	1.0.9.8.2.255
51	Current kVAh.TOD3 (Import).	Not Specified	1.0.9.8.3.255
52	Current kVAh.TOD4 (Import).	Not Specified	1.0.9.8.4.255
53	Current kVAh.TOD5 (Import).	Not Specified	1.0.9.8.5.255
54	Current MD in KVA with date & time (Import).	Not Specified	1.0.9.6.0.255
55	Current MD in kVA with date & time TOD 1 (Import).	Not Specified	1.0.9.6.1.255
56	Current MD in kVA with date & time TOD 2 (Import).	Not Specified	1.0.9.6.2.255
57	Current MD in kVA with date & time TOD 3 (Import).	Not Specified	1.0.9.6.3.255
58	Current MD in KVA with date & timeTOD4 (Import).	Not Specified	1.0.9.6.4.255
59	Current MD in KVA with date & timeTOD5 (Import).	Not Specified	1.0.9.6.5.255
60	MD Reset Count.	Not Specified	0.0.0.1.0.255
61	Cumulative MD Total.	Not Specified	1.0.9.2.0.255
62	Phase Sequence	Not Specified	1.0.96.7.30.255
63	Phase Angle 2	Not Specified	1.0.81.7.1.255
64	Phase Angle 3	Not Specified	1.0.81.7.2.255
65	Last Billing Date	0.0.0.1.2.255	0.0.0.1.2.255
66	RF/ GSM signal Strength in milli db	0.b.96.12.5.255	0.b.96.12.5.255

OBIS CODES -IMPORT MODE			
	Billing Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Billing Profile	1.0.98.1.0.255	1.0.98.1.0.255
	Billing Scaler	1.0.94.91.6.255	1.0.94.91.6.255
1	Bill Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255
2	Bill kWh ToD1 (Import).	1.0.1.8.1.255	1.0.1.8.1.255
3	Bill kWh ToD2 (Import).	1.0.1.8.2.255	1.0.1.8.2.255
4	Bill kWh ToD3 (Import).	1.0.1.8.3.255	1.0.1.8.3.255
5	Bill kWh ToD4 (Import).	1.0.1.8.4.255	1.0.1.8.4.255
6	Bill kWh ToD5 (Import).	1.0.1.8.5.255	1.0.1.8.5.255
7	Bill Cumulative kVARh–Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
8	Bill kVARh–Lag.TOD1 (Import).	Not Specified	1.0.5.8.1.255
9	Bill kVARh–Lag.TOD2 (Import).	Not Specified	1.0.5.8.2.255
10	Bill kVARh–Lag.TOD3 (Import).	Not Specified	1.0.5.8.3.255
11	Bill kVARh–Lag.TOD4 (Import).	Not Specified	1.0.5.8.4.255
12	Bill kVARh–Lag.TOD5 (Import).	Not Specified	1.0.5.8.5.255
13	Bill Cumulative kVARh–Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
14	Bill kVARh–Lead.TOD1 (Import).	Not Specified	1.0.8.8.1.255
15	Bill kVARh–Lead.TOD2 (Import).	Not Specified	1.0.8.8.2.255
16	Bill kVARh–Lead.TOD3 (Import).	Not Specified	1.0.8.8.3.255
17	Bill kVARh–Lead.TOD4 (Import).	Not Specified	1.0.8.8.4.255
18	Bill kVARh–Lead.TOD5 (Import).	Not Specified	1.0.8.8.5.255
19	Bill Cumulative kVAh (Import).	1.0.9.8.0.255	1.0.9.8.0.255
20	Bill kVAh TOD1 (Import).	1.0.9.8.1.255	1.0.9.8.1.255
21	Bill kVAh TOD2 (Import).	1.0.9.8.2.255	1.0.9.8.2.255
22	Bill kVAh TOD3 (Import).	1.0.9.8.3.255	1.0.9.8.3.255
23	Bill kVAh TOD4 (Import).	1.0.9.8.4.255	1.0.9.8.4.255
24	Bill kVAh TOD5 (Import).	1.0.9.8.5.255	1.0.9.8.5.255
25	Bill MD in KVA with date & time (Import).	1.0.9.6.0.255	1.0.9.6.0.255
26	Bill MD in kVA with date & time ToD1 (Import).	1.0.9.6.1.255	1.0.9.6.1.255
27	Bill MD in kVA with date & time ToD2 (Import).	1.0.9.6.2.255	1.0.9.6.2.255
28	Bill MD in kVA with date & time ToD3 (Import).	1.0.9.6.3.255	1.0.9.6.3.255
29	Bill MD in kVA with date & time ToD4 (Import).	1.0.9.6.4.255	1.0.9.6.4.255
30	Bill MD in kVA with date & time ToD5 (Import).	1.0.9.6.5.255	1.0.9.6.5.255
31	Bill Power Factor (Import).	1.0.13.0.0.255	1.0.13.0.0.255

OBIS CODES -IMPORT MODE			
Billing Register		**DLMS**	**BEST proposed OBIS Code**
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255.	1.0.94.91.6.255
i	Month	0.0.0.1.2.255	0.0.0.1.2.255

OBIS CODES -IMPORT MODE			
Billing Register		**DLMS**	**BEST proposed OBIS Code**
ii	ToD wise Cumulative kWh ToD1 (Import).	1.0.1.8.1.255	1.0.1.8.1.255
	ToD2 (Import).	1.0.1.8.2.255	1.0.1.8.2.255
	ToD3 (Import).	1.0.1.8.3.255	1.0.1.8.3.255
	ToD4 (Import).	1.0.1.8.4.255	1.0.1.8.4.255
	ToD5 (Import).	1.0.1.8.5.255	1.0.1.8.5.255
iii	ToD wise Cumulative kVARh Lag ToD1 (Import).	Not Specified	1.0.5.8.1.255
	ToD2 (Import).	Not Specified	1.0.5.8.2.255
	ToD3 (Import).	Not Specified	1.0.5.8.3.255
	ToD4 (Import).	Not Specified	1.0.5.8.4.255
	ToD5 (Import).	Not Specified	1.0.5.8.5.255
iv	ToD wise Cumulative kVARh Lead ToD1 (Import).	Not Specified	1.0.8.8.1.255
	ToD2 (Import).	Not Specified	1.0.8.8.2.255
	ToD3 (Import).	Not Specified	1.0.8.8.3.255
	ToD4 (Import).	Not Specified	1.0.8.8.4.255
	ToD5 (Import).	Not Specified	1.0.8.8.4.255
v	ToD wise Cumulative kVAh ToD1 (Import).	1.0.9.8.1.255	1.0.9.8.1.255
	ToD2 (Import).	1.0.9.8.2.255	1.0.9.8.2.255
	ToD3 (Import).	1.0.9.8.3.255	1.0.9.8.3.255
	ToD4 (Import).	1.0.9.8.4.255	1.0.9.8.4.255
	ToD5 (Import).	1.0.9.8.5.255	1.0.9.8.5.255
vi	ToD wise Power factor ToD1 (Import).	Not Specified	1.0.13.0.1.255
	ToD2 (Import).		1.0.13.0.2.255
	ToD3 (Import).		1.0.13.0.3.255
	ToD4 (Import).		1.0.13.0.4.255
	ToD5 (Import).		1.0.13.0.5.255
vii	ToD wise MD in kVA with date & time ToD1 (Import).	1.0.9.6.1.255	1.0.9.6.1.255
	ToD2 (Import).	1.0.9.6.2.255	1.0.9.6.2.255
	ToD3 (Import).	1.0.9.6.3.255	1.0.9.6.3.255
	ToD4 (Import).	1.0.9.6.4.255	1.0.9.6.4.255
	ToD5 (Import).	1.0.9.6.5.255	1.0.9.6.5.255

OBIS CODES -IMPORT MODE		
Billing Register	**DLMS**	**BEST proposed OBIS Code**

	Technical requirements	Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255	1.0.94.91.6.255
Viii	ToD wise MD in kW with date & time ToD1 (Import).	1.0.1.6.1.255	1.0.1.6.1.255
	ToD2 (Import).	1.0.1.6.2.255	1.0.1.6.2.255
	ToD3 (Import).	1.0.1.6.3.255	1.0.1.6.3.255
	ToD4 (Import).	1.0.1.6.4.255	1.0.1.6.4.255
	ToD5 (Import).	1.0.1.6.5.255	1.0.1.6.5.255
ix	Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255
x	Cumulative kVARh – Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
xi	Cumulative kVARh – Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
xii	Cumulative kVAh (Import).	1.0.9.8.0.255	1.0.9.8.0.255
xiii	Average Power Factor (Import).	1.0.13.0.0.255	1.0.13.0.0.255
xiv	Bill MD in Kva with date and time (Import).	1.0.9.6.0.255	1.0.9.6.0.255
xv	Bill MD in Kw with date and time(Import).	1.0.1.6.0.255	1.0.1.6.0.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
1	Instantaneous 3ph kW load. (Export).	1.0.2.7.0.255	1.0.2.7.0.255
2	Instantaneous 3ph kVAr load with lag lead indication(Export).	1.0.4.7.0.255	1.0.4.7.0.255
3	Instantaneous 3ph KVA load (Export).	1.0.10.7.0.255	1.0.10.7.0.255
4	Current Cumulative kWh (Export).	1.0.2.8.0.255	1.0.2.8.0.255
5	Current kWh ToD 1 (Export).	Not Specified	1.0.2.8.1.255
6	Current kWh ToD 2 (Export).	Not Specified	1.0.2.8.2.255
7	Current kWh ToD 3 (Export).	Not Specified	1.0.2.8.3.255
8	Current kWh ToD 4 (Export).	Not Specified	1.0.2.8.4.255
9	Current kWh ToD 5 (Export).	Not Specified	1.0.2.8.5.255
10	Current Cumulative kVARh Lag (Export).	1.0.7.8.0.255	1.0.7.8.0.255
13	Current kvarh Lag TOD1 (Export).	Not Specified	1.0.7.8.1.255
14	Current kvarh Lag TOD2 (Export).	Not Specified	1.0.7.8.2.255
15	Current kvarh – Lag TOD3 (Export).	Not Specified	1.0.7.8.3.255

16	Current kvarh – Lag TOD4 (Export).	Not Specified	1.0.7.8.4.255
17	Current kvarh – Lag TOD5 (Export).	Not Specified	1.0.7.8.5.255
18	Current Cumulative kvarh – Lead (Export).	1.0.6.8.0.255	1.0.6.8.0.255
19	Current kvarh – Lead TOD1 (Export).	Not Specified	1.0.6.8.1.255
20	Current kvarh – Lead TOD2 (Export).	Not Specified	1.0.6.8.2.255
21	Current kvarh – Lead TOD3 (Export).	Not Specified	1.0.6.8.3.255
22	Current kvarh – Lead TOD4 (Export).	Not Specified	1.0.6.8.4.255
23	Current kvarh – Lead TOD5 (Export).	Not Specified	1.0.6.8.5.255
24	Current Cumulative kVAh (Export).	1.0.10.8.0.255	1.0.10.8.0.255
25	Current kVAh.TOD1 (Export).	Not Specified	1.0.10.8.1.255
26	Current kVAh.TOD2 (Export).	Not Specified	1.0.10.8.2.255
27	Current kVAh.TOD3 (Export).	Not Specified	1.0.10.8.3.255
28	Current kVAh.TOD4 (Export).	Not Specified	1.0.10.8.4.255
29	Current kVAh.TOD5 (Export).	Not Specified	1.0.10.8.5.255
30	Current MD in KVA with date & time (Export).	Not Specified	1.0.10.6.0.255
OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
31	Current MD in kVA with date &time TOD 1(Export).	Not Specified	1.0.10.6.1.255
32	Current MD in kVA with date & time TOD 2(Export).	Not Specified	1.0.10.6.2.255
33	Current MD in kVA with date & time TOD 3 (Export).	Not Specified	1.0.10.6.3.255
34	Current MD in KVA with date & timeTOD4(Export).	Not Specified	1.0.10.6.4.255
35	Current MD in KVA with date & timeTOD5(Export).	Not Specified	1.0.10.6.5.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
Billing Register		**DLMS**	**BEST proposed OBIS Code**
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255	1.0.94.91.6.255
i	Month	0.0.0.1.2.255	0.0.0.1.2.255
ii	ToD wise Cumulative kWh ToD1 (Export).	1.0.2.8.1.255	1.0.2.8.1.255
	ToD2 (Export).	1.0.2.8.2.255	1.0.2.8.2.255
	ToD3 (Export).	1.0.2.8.3.255	1.0.2.8.3.255
	ToD4 (Export).	1.0.2.8.4.255	1.0.2.8.4.255
	ToD5 (Export).	1.0.2.8.5.255	1.0.2.8.5.255
iii	ToD wise Cumulative kVARh Lag ToD1 (Export).	Not Specified	1.0.7.8.1.255
	ToD2 (Export).	Not Specified	1.0.7.8.2.255
	ToD3 (Export).	Not Specified	1.0.7.8.3.255
	ToD4 (Export).	Not Specified	1.0.7.8.4.255
	ToD5 (Export).	Not Specified	1.0.7.8.5.255

iv	ToD wise Cumulative kVARh Lead ToD1 (Export).	Not Specified	1.0.6.8.1.255
	ToD2 (Export).	Not Specified	1.0.6.8.2.255
	ToD3 (Export).	Not Specified	1.0.6.8.3.255
	ToD4 (Export).	Not Specified	1.0.6.8.4.255
	ToD5 (Export).	Not Specified	1.0.6.8.5.255
v	ToD wise Cumulative kVAh ToD1 (Export).	1.0.10.8.1.255	1.0.10.8.1.255
	ToD2 (Export).	1.0.10.8.2.255	1.0.10.8.2.255
	ToD3 (Export).	1.0.10.8.3.255	1.0.10.8.3.255
	ToD4 (Export).	1.0.10.8.4.255	1.0.10.8.4.255
	ToD5 (Export).	1.0.9.8.5.255	1.0.9.8.5.255
vi	ToD wise Power factor ToD1 (Export).	Not Specified	1.0.13.0.1.255
	ToD2 (Export).		1.0.13.0.2.255
	ToD3 (Export).		1.0.13.0.3.255
	ToD4 (Export).		1.0.13.0.4.255
	ToD5 (Export).		1.0.13.0.5.255
vii	ToD wise MD in kVA with date & time ToD1 (Export).	1.0.10.6.1.255	1.0.10.6.1.255
	ToD2 (Export).	1.0.10.6.2.255	1.0.10.6.2.255
	ToD3 (Export).	1.0.10.6.3.255	1.0.10.6.3.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE

Billing Register		DLMS	BEST proposed OBIS Code
	ToD4 (Export).	1.0.10.6.4.255	1.0.10.6.4.255
	ToD5 (Export).	1.0.10.6.5.255	1.0.10.6.5.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE

Billing Register		DLMS	BEST proposed OBIS Code
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255	1.0.94.91.6.255
Viii	ToD wise MD in kW with date & time ToD1 (Export).	1.0.2.6.1.255	1.0.2.6.1.255
	ToD2 (Export).	1.0.2.6.2.255	1.0.2.6.2.255
	ToD3 (Export).	1.0.2.6.3.255	1.0.2.6.3.255
	ToD4 (Export).	1.0.2.6.4.255	1.0.2.6.4.255
	ToD5 (Export).	1.0.2.6.5.255	1.0.2.6.5.255
ix	Cumulative kWh (Export).	1.0.2.8.0.255	1.0.2.8.0.255
x	Cumulative kVARh – Lag (Export).	1.0.7.8.0.255	1.0.7.8.0.255

xi	Cumulative kVARh – Lead (Export).	1.0.6.8.0.255	1.0.6.8.0.255
xii	Cumulative kVAh (Export).	1.0.10.8.0.255	1.0.10.8.0.255
xiii	Average Power Factor (Export).	1.0.13.0.0.255	1.0.13.0.0.255
xiv	Bill MD in Kva with date and time (Export).	1.0.10.6.0.255	1.0.10.6.0.255
xv	Bill MD in Kw with date and time (Export).	1.0.2.6.0.255	1.0.2.6.0.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

OBIS Codes				
Technical requirements			**DLMS**	**BEST proposed OBIS Code**
i	Low/High Voltage- a) Voltage failure, b) Voltage Unbalance, c) Overvoltage d) Under voltage.	Voltage Tamper Profile	0.0.99.98.0.255	0.0.99.98.0.255
		Voltage Tamper Summary Profile	0.0.21.0.5.255	0.0.21.0.5.255
ii	Current Reversal.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
		Current Tamper Summary Profile	0.0.21.0.6.255	0.0.21.0.6.255
iii	Meter Cover Open.	0.0.99.98.5.255	Event ID 251	Event ID 251
iv	Magnetic Defraud Energy.		Not specified	1.0.1.8.0.255
	Magnetic Tamper Event with Date Time	Tamper Event	Event ID201,202	0.0.96.11.4.255
v	Low Current- a) Current Bypass, b) Current Open, c) Over Current.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
vi	Current Unbalance.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
		Current Tamper Summary Profile	0.0.21.0.6.255	0.0.21.0.6.255
vii	Low Power Factor	Low Power Factor	Event ID 205,206- Low Power Factor.	Event ID 205,206- Low Power Factor.
viii	Additional points.	Cumulative Tamper Count	0.0.94.91.0.255	0.0.94.91.0.255
		No. of Power failure	0.b.99.98.2.255	0.0.96.7.0.255
		Cumulative Duration of Power failure		0.0.94.91.8.255
		Power ON Duration in minutes (bill to bill)		0.0.94.91.13.255

OBIS Codes		
Clause No 23.2	**DLMS**	**BEST proposed**

Technical requirements			OBIS Code
Events Profile			
Events.	Voltage Tamper Profile	0.0.99.98.0.255	0.0.99.98.0.255
	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
	Power Related Tampers	0.0.99.98.2.255	0.0.99.98.2.255
	Transaction Tamper Profile	0.0.99.98.3.255	0.0.99.98.3.255
	Other Tamper Profiles	0.0.99.98.4.255	0.0.99.98.4.255
	Non Rollover Tamper Profiles	0.0.99.98.5.255	0.0.99.98.5.255
Capture Parameters for Events of Scaler Profile			
Parameters.	Date and Time of event	0.0.1.0.0.255	0.0.1.0.0.255
	Event Code	0.0.96.11.e.255	0.0.96.11.e.255
	Current, IR	1.0.31.7.0.255	1.0.31.7.0.255
	Current, IY	1.0.51.7.0.255	1.0.51.7.0.255
	Current, IB	1.0.71.7.0.255	1.0.71.7.0.255
	Voltage, VRN	1.0.32.7.0.255	1.0.32.7.0.255
	Voltage, VYN	1.0.52.7.0.255	1.0.52.7.0.255
	Voltage, VBN	1.0.72.7.0.255	1.0.72.7.0.255
	Signed power factor, R-Phase	1.0.33.7.0.255	1.0.33.7.0.255
	Signed power factor, Y-Phase	1.0.53.7.0.255	1.0.53.7.0.255
	Signed power factor, B-Phase	1.0.73.7.0.255	1.0.73.7.0.255
	Cumulative Energy kWh	1.0.1.8.0.255	1.0.1.8.0.255
	Cumulative Energy kVAh	1.0.9.8.0.255	1.0.9.8.0.255
Tamper Summary Profile.		Additional Readout profile in IEC62056-62	
1	Voltage Tamper Summary Profile.	0.0.21.0.5.255	0.0.21.0.5.255
2	Current Tamper Summary Profile.	0.0.21.0.6.255	0.0.21.0.6.255
3	Other Tamper Summary Profile.	0.0.21.0.7.255	0.0.21.0.7.255
4	Non Rollover Tamper Summary Profile.	0.0.21.0.8.255	0.0.21.0.8.255

OBIS Codes

Technical requirements		DLMS	BEST proposed OBIS Code
Parameters.			
1	Tamper Event ID.	0.0.96.11.e.255	0.0.96.11.e.255
2	Cumulative Tamper Count.	0.0.94.91.0.255	0.0.94.91.0.255
3	Cumulative Tamper Duration.	Not Specified	Not Specified
4	Date & Time of First Occurrence.	1.0.0.9.0.255	1.0.0.9.0.255
5	Date & Time of First restore.	1.0.0.9.1.255	1.0.0.9.1.255
6	Date & Time of Latest Occurrence.	1.0.0.9.2.255	1.0.0.9.2.255
7	Date & Time of Latest Restoration.	1.0.0.9.3.255	1.0.0.9.3.255

ESD.			Event ID 37	Event ID 37
Clause No , Self Diagnostic Features.		i) RTC Status-BIT 0 (0x01)ii) NVM Status- BIT 1(0x02) iii) RTC Battery- BIT 2(0x04)	Not Specified	1.0.96.5.0.255
General Purpose Parameters:-Profile Code: 0.0.94.91.10.255.				
1	Meter Serial Number.		0.0.96.1.0.255	0.0.96.1.0.255
2	Manufacture Name.		0.0.96.1.1.255	0.0.96.1.1.255
3	Firmware version for meter.		1.0.0.2.0.255	1.0.0.2.0.255
4	Meter Type.		0.0.94.91.9.255	0.0.94.91.9.255
5	Meter year of manufacture.		0.0.96.1.4.255	0.0.96.1.4.255
6	Category.		0.0.94.91.11.255	0.0.94.91.11.255
7	Current Rating.		0.0.94.91.12.255	0.0.94.91.12.255
8	Voltage Rating		1.0.0.6.0.255	1.0.0.6.0.255
9	Accuracy Class		Not Specified	1.0.96.141.0.255
10	Meter Constant		1.0.0.3.0.255	1.0.0.3.0.255
11	Internal CT Ratio.		1.0.0.4.2.255	1.0.0.4.2.255
12	Internal PT Ratio.		1.0.0.4.3.255	1.0.0.4.3.255
Programmable Parameters				
1	Real Time Clock-Date and Time.		0.0.1.0.0.255	0.0.1.0.0.255
2	Demand Integration Period.		1.0.0.8.0.255	1.0.0.8.0.255
3	Profile Capture Period.		1.0.0.8.4.255	1.0.0.8.4.255
4	Single-action Schedule for Billing Dates.		0.0.15.0.0.255	0.0.15.0.0.255
5	Activity Calendar for Time Zones.		0.0.13.0.0.255	0.0.13.0.0.255
6	Image Transfer		0.0.44.0.0.255	0.0.44.0.0.255
7	Metering Mode		0.0.94.96.19.255	0.0.94.96.19.255
8	Current Association MR (LLS secret change)		0.0.40.0.2.255	0.0.40.0.2.255
9	Current Association US (HLS Key change)		0.0.40.0.3.255	0.0.40.0.3.255
10	Current Association FW (HLS Key change)		0.0.40.0.5.255	0.0.40.0.5.255
11	Global Key (encryption and authentication)		0.0.43.0.e.255 (e=2,3,4,5)	0.0.43.0.e.255 (e=2,3,4,5)
12	Image Activation Single Action Shedule		0.0.15.0.2.255	0.0.15.0.2.255
13	Event Status Word Filter		0.0.94.91.26.255	0.0.94.91.26.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.			

OBIS Codes			
Clause No , Load Survey		DLMS (Load Profile OBIS Codes)	BEST proposed OBIS Code
Technical requirements		Profile 1.0.99.1.0.255	1.0.99.1.0.255
		Scaler 1.0.94.91.4.255	1.0.94.91.4.255
1	Voltage of each phase	VRN 1.0.32.27.0.255	VRN 1.0.32.27.0.255
		VYN1.0.52.27.0.255	VYN 1.0.52.27.0.255
		VBN 1.0.72.27.0.255	VBN 1.0.72.27.0.255
2	Current of each phase	IR 1.0.31.27.0.255	IR 1.0.31.27.0.255
		IY 1.0.51.27.0.255	IY 1.0.51.27.0.255
		IB 1.0.71.27.0.255	IB 1.0.71.27.0.255
3	Kwh	1.0.1.29.0.255	1.0.1.29.0.255
4	kVAh	1.0.9.29.0.255	1.0.9.29.0.255
5	Kw	Not Specified	Need not specify. Derived parameter in BCS.
6	Kva	Not Specified	
7	PF	Not Specified	
8	kVarh(lag)	Not Specified	1.0.5.29.0.255
9	kVarh(lead)	Not Specified	1.0.8.29.0.255
10	Real Time Clock Date and Time	0.0.1.0.0.255	0.0.1.0.0.255
Daily Load Profile Parameters			
Profile		Not Specified	1.0.99.2.0.255
Scaler		Not Specified	1.0.94.91.5.255
1	Real Time Clock	Not Specified	0.0.1.0.0.255
2	Cumulative Energy, kWh	Not Specified	1.0.1.8.0.255
3	Cumulative Energy, kVAh	Not Specified	1.0.9.8.0.255
4	Cumulative Reactive Energy lag	Not Specified	1.0.5.8.0.255
5	Cumulative Reactive Energy kVArh Lead	Not Specified	1.0.8.8.0.255
6	Fundamental Energy kWh	Not Specified	1.0.1.8.1.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

ANNEXURE-C1: LT Compact CTs for Three Phase LT CT Meters

<u>Section I</u>-General: - This specification covers manufacture test & supply of LT Current Transformer Bank of class 0.5 accuracy.

These LVCT Banks are required for installation of LVCT operated static energy metering system to measure accurate load current drawn at consumer installation through Current Transformer and further plays important roll to measure electrical parameters such as kWh, kVARh, kVA Demand and KVAH etc. by static energy meter. The LVCT metering installation will be operated on 415 Volt, 50Hz, 3-phase, 4-wire solidly earthed system.

These LVCT Banks will be integrated part of metering system required to measure the Kwh energy of our L.V. consumers and to be mounted on wall in service position cabin.

If required these LVCT Banks will be connected to LVCTO meters through Adapters.

The metering CT Bank shall be suitable for operation under the following climatologically data of the city of Mumbai.

a) Ambient temperature: Varying from 15^0 C to 45^0 C.

b) Relative humidity: Varying 40% to 100%.

c) Rainfall in a year: Varying 1808mm to 3481.6mm.

Section II: Specification:

The secondary core (inside LVCT Bank) shall be ring type wound core manufactured from the virgin electrolytic grade copper metal of conductivity not less than 99.30%.

LVCTs shall be designed in accordance with IS:2705 (Part I & II) 1992/latest, for measuring C.T. unless specified.

All the LVCT Banks shall be suitably tropicalized and rated for the service conditions on site.

The CT Bank shall be liberally designed and manufactured from the best quality materials for satisfactory operation under onerous conditions without causing any permanent injury, shortening the life. It shall not be unnecessarily bulky and the gross weight shall be specified in the offer by the manufacturers.

Transformation ratio & rated burden: The transformation ratio i.e. rated primary current/rated secondary current for each CT in LVCT Bank shall be as given in Section 3.0 & the rated burden of each CT shall be 2.5 VA.

Instrument Security Factor: The Instrument security factor for each C.T. shall not be more than 5.

Accuracy Class: Each LVCT shall have accuracy class 0.5 and conforms to clause 3 of IS: 2705 (Part I& II) 1992 with latest amendments.

Temperature Rise: Each LVCT shall be suitable for continuous operation at rated primary current and with rated secondary burden. The temperature rise of the winding shall not exceed 40^0C over an ambient temperature 40^0C.

Variation in voltage and/or frequency: Each LVCT shall be designed to give the rated output without loss of accuracy (with temperature rise not exceeding that specified in Section 2.8) at any voltage within +6% of the rated voltage of 415 Volts and with the frequency variation of +6% of 50 Hz.

Insulation: Insulation of the winding shall be non-hygroscopic and shall not soften, lose shape or drain off under temperature variation. The core of the LVCTs and mounting clamps should be coated with epoxy/polyurethane compound.

LVCT Bank shall be properly supported by adequate size of metallic bracket and shall be so placed that it shall be away from live bus bar. The metallic bracket non corrosives Galvanized MS (mounting plate) shall be so placed that it shall bear the weight of LVCT Bank & Adapter and firmly hold the same on metering installation. It shall have high mechanical strength for bearing forces/tension during installation. The mounting plate performance shall be reliable throughout life of LVCT bank.

Secondary Terminals (Stud): Secondary studs shall be of brass nickel plated with high mechanical strength, so that they shall not bend or break during transportation or use. The LVCT operated meter will be mounted on these studs with/without Adapters. Hence, Secondary studs shall be of exact dimensions shown in our drawing.

The secondary current terminals should be half-rounded.

Secondary Terminal shall be suitable to carry 10A current continuously.

Primary bus bar size shall be as per drawing &bus bar shall be fabricated from flat EC (Electrolyte) grade virgin copper metal of conductivity not less than 99.30%.

In the inner side of LVCT the potential wire shall be crimped as well as soldered also.

Nut Bolt: The nut bolts shall be properly fixed in the holes provided on the busbar on P1 & P2. Nut bolt size is as follows:

Ratio of LVCTO	Nut bolt (mm)
150/5	35 x 10 with bimetallic washer.
200/5	35 x 10 with bimetallic washer.
300/5	35 x 10 with bimetallic washer.
400/5	50 x 12 with bimetallic washer.

Terminal Markings: Primary busbar shall have P1 and P2 permanent marking on busbar as well as Epoxy body. The incoming service cable will be terminated on P1 end located at bottom side of LVCT bank. P2 terminal will be outgoing to consumer load.

2.17 Secondary studs shall have markings as follows:

I] Current terminals:

a) R phase: 1S1,1S2
b) Y phase: 2S1,2S2
c) B phase: 3S1,3S2
d) Neutral: NS1, NS2

II] Voltage Terminals:

R, Y, B, N (As per meter manufacturers terminals may vary. Please refer respective drawings)

3.0 **Section III: Sizes of LVCTs:**

3.1 Sizes of LVCTs are as follows:1) 150/5 2) 200/5 3) 300/5 & 600/5

3.2 Colour: Colour of LVCT Banks as per ratios are as follows:

1)150/5: Brick red

2)200/5: Blue

3)300/5: Yellow

4)600/5: Brown

Section IV: Tests:

Type Tests Certificate: The Tenderer shall submit the Type Test Certificate of similar LVCT bank at the time of quoting the Tender. All tests specified under Clause 9 of IS:2705 (Part I) 1992 and Clause7 of IS:2705 (Part II) 1992 shall be carried out. The tenderer shall furnish Type Test certificates in duplicate. The Type Test reports shall not be older than Five (5) years from the opening date of the tender.

Additional tests:

Conductivity Test Certificate given by accredited& approved testing lab for Copper busbar used for primary busbar and copper wire used for secondary core shall be submitted.

Batch Certificate of Epoxy Resin from manufacturer shall be submitted.

In addition to the tests specified in clause 4.1, the purchaser reserves the right of carrying out any inspection on any reasonable test at the manufacturer's works during all stages of manufacturing of the LVCT banks as well as such test in purchaser's testing lab for confirmation of quality and performance of LVCT bank.

Tenderer shall have at least following test facilities at his works:

Ratio & phase angle measurement.

Power Frequency dry withstand test on Primary & Secondary windings.

Over–Voltage inter turn test.

Continuity Test: Manufacturer's shall provide certificate of the continuity between primary and secondary potential terminals.

Tests Reports: The successful Tender shall submit Routine Test Certificate for all LVCT banks as per IS: 2705/1992 after approval of proto type along with supply of the LVCT banks.

Section V: Dispatch Instructions:

Name Plate marking:

Metallic name plate of Anodized Aluminum shall be provided on the L.H.S. side of CT Bank. Each CT Bank shall have the following particulars indelibly marked on it.

Description: L.V. Metering LVCT Bank.

a) Manufacturer's Name.

b) Manufacturer's Serial Number/Year of manufacture (Height of the Serial Number shall be 7 mm). c)CT Ratios.
d) Rated Burden in Volt Ampere/Phase: VA.
e) Class of Accuracy.
f) Instrument Security Factor.
g) Rated Voltage &System Symbol.
h) Insulation Level.
i) Frequency.
j) Indian Standard (IS) No.
k) Property of BEST Undertaking.
l) P.O. Number.

In addition to above "Property of BEST Undertaking" shall be permanently engraved on epoxy body of CT bank.

Drawings: The tenderer shall refer our Drawings for all dimensional details (attached in Annexure-II) for our last procured CT Banks for various ratios & various meter manufacturers.

Tenderer shall manufacture LVCT Banks as per jointly approved drawings by representative of Tenderer and BEST Undertaking. The drawing contains overall dimension, spacing between phase & neutral busbar, dimensions of phase & neutral busbar, spacing between secondary current & potential studs and their dimensions, etc.

Tenderer shall prepare the drawing as per dummy meters available with Meters Department and mention all dimensional details in mm in the drawings for the offer. (The representative of the Tenderer may visit Meters Department before prior appointment to get the necessary details and physical check of the energy meters). The drawing shall be to scale and fully detailed. Tenderers shall submit the dimensional drawings in duplicate with the offer. All-important dimensions shall be given and the material of each component shall be indicated. Any deviations from the undertakings approved drawings shall clearly mention on the submitted drawings.

The successful tenderer shall submit the drawings in duplicate within 15 days from the receipt of Purchase Order and get the same approved from Divisional Engineer, Meters Department, B.E.S.&T. Undertaking, 2nd Floor, TTC Building inside Wadala Bus Depot, opp Dr. Ambedkar collage Dadar(East), Mumbai 400 008 during office working hours (i.e. 9.00 hrs to 17.00 hrs) on any working day (i.e. Monday to Friday).

Section VI: Special Instructions:

The tenderer shall physically inspect the existing LVCT banks of different ratios, LVCTO meters and adapters available with BEST prior to participating in the tender process at our office of the Divisional Engineer, Meters Department, B.E.S.&T. Undertaking, 2nd Floor, TTC Building inside Wadala Bus Depot, opp Dr. Ambedkar collage Dadar(East), Mumbai 400 008 during office working hours (i.e. 9.00 hrs to 17.00 hrs) on any working day (i.e. Monday to Friday).

Proto-type: Successful tenderer before going for full production of LVCT Bank, shall submit the proto-type for our approval within 4 weeks from the date of from the date of approval of drawing. After the approval for proto- type LVCT Bank is obtained from us, the successful tenderer shall start manufacturing LVCT Banks and deliver the same, as per delivery schedule.

Proto-type shall submit to MTS Department for the necessary testing and physical verification of dimensions.

In case, if the proto-type is failed at the first instance, one more chance will be given for submitting revised proto-type. If the proto-type fails second time, then the order will be cancelled and same will be transferred to other supplier as per rules & regulations of the Undertaking. This condition is applicable to all tenderers i.e.

regular supplier, semi-regular supplier and new supplier.

List of orders executed for the same shall be furnished giving details such as P.O. No & date, quantity supplied, client details etc. for the period of last 5 years.

The successful tenderer shall depute technical representative for discussion if required during the drawing approval stage so as to avoid delay.

Section VII: Inspection:

All the acceptance test shall be carried out at tenderers works or the testing lab of purchaser undertaking which may be required by the purchaser.

Cost of lot/proto-type inspection shall be borne by the tenderer.

Two officers of the undertaking shall be deputed for inspection & witnessing the tests.

Section VIII: Delivery Schedule:

Delivery schedule shall be intimated to successful tenderer at the time of placement of Purchase Order. Undertaking reserves the right to revise the delivery schedule.

Section IX: Guarantee:

LVCT banks shall be guaranteed for 24 months from the date of Acceptance of LVCT banks for manufacturing defects or bad workmanship by manufacturer. The tenderer will collect the damaged LVCT bank from our Kussara store at his own cost and will deliver the replaced LVCT bank with test report at our Kussara store.

10.0 Schedule of Guaranteed Technical Particulars (GTP)& Dimensional details shall be furnished as per Table below

11.0 For any clarification other than commercial terms, tenderer may contact Divisional Engineer, High Value Consumers Department, B.E.S.&T. Undertaking, 4th Floor, Tardeo Bus Station Complex, R.S. Nimkar Marg, Mumbai 400 008 during office working hours (i.e. 9.00 hrs to 17.00 hrs) on any working day (i.e. Monday to Friday).

12.0 **Packing & Delivery**

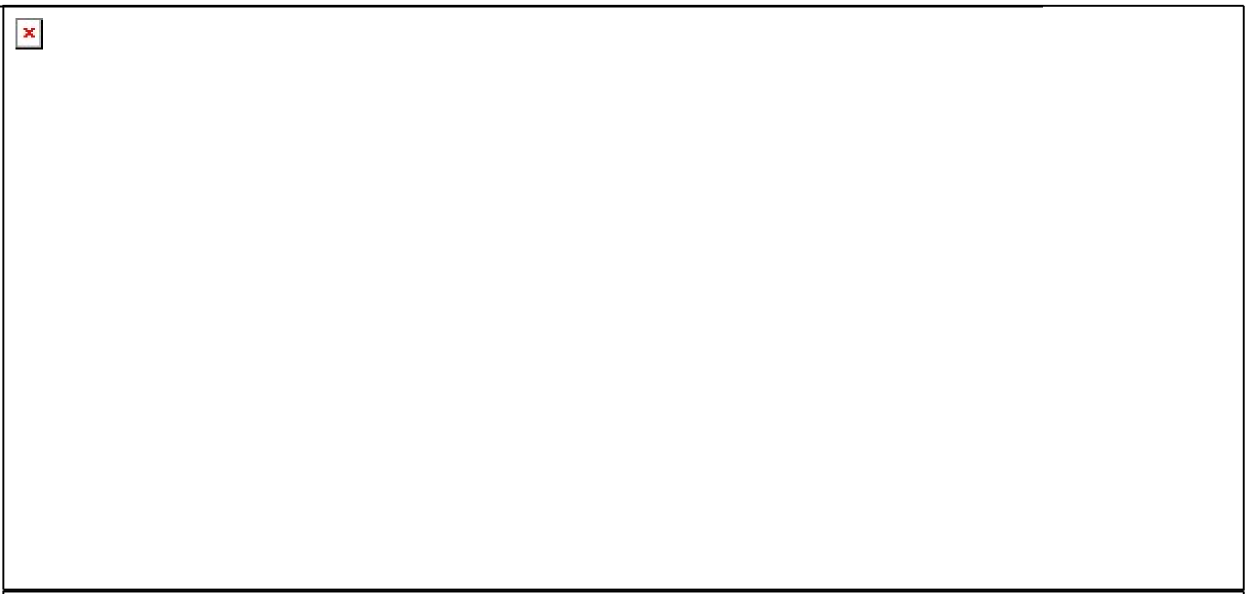
The supply of CT Bank shall be made by serially packed and starting to end serial numbers. Each CT Bank shall be packed in separate box/carton.

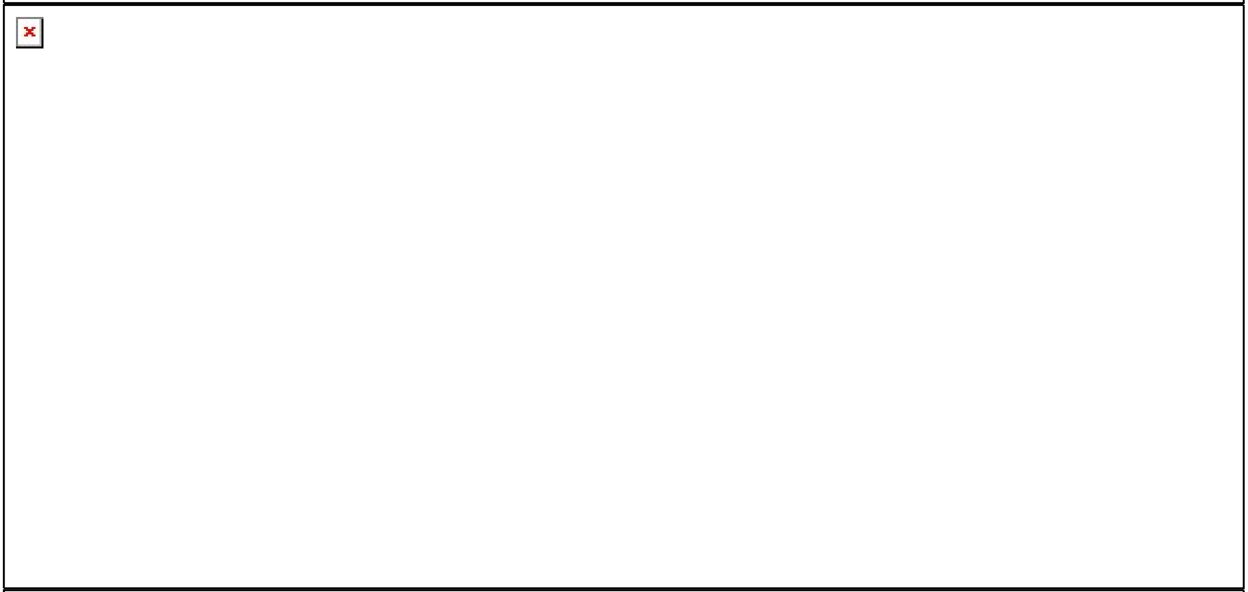
****

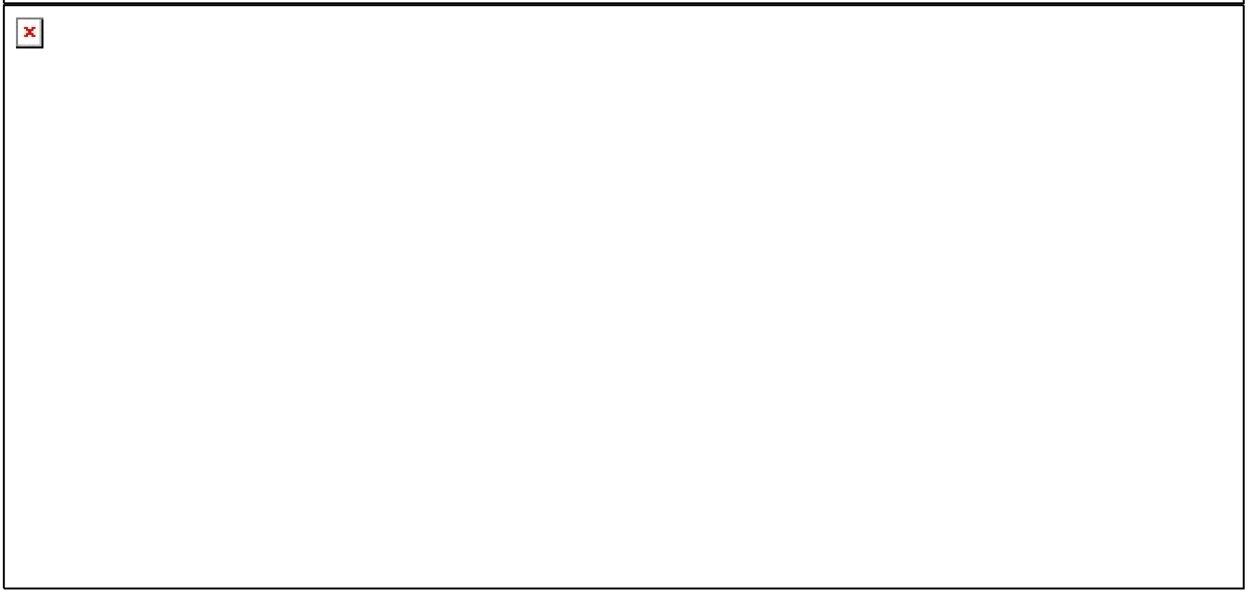
Supply of LV metering CT bank (LVCT): Schedule of Guaranteed Technical Particular (GTP).

Sr. No.	Description.	Specified Value.
1	Manufactures Name & Place of manufacturing.	
2	Brand Name.	
3	Applicable Standards.	IS: 2705/1992.
4	Accuracy Class.	0.5.

5	Frequency in Hz.	50 Hz.
6	Highest System Voltage.	660V.
7	Rated Voltage.	415V.
8	Primary Current.	150, 200, 300 & 600A
9	Second Current.	5A.
10	Rated Burden.	2.5VA.
11	Instrument Security Factor (ISF).	5 Max.
12	Insulation Level.	3Kv.
13	Temperature rise of winding above ambient temperature of 45°. At rated primary current at rated secondary burden.	40 max.
14	Class of Insulation.	Class B.
15	Insulation Type.	Epoxy Resin Cast.
16		
	5% of Rated Current.	1.5.
	20% of Rated Current.	0.75.
	100% of Rated Current.	0.5.
	120% of Rated Current.	0.5.
17		
	5% of Rated Current.	90.
	20% of Rated Current.	45.
	100% of Rated Current.	30.
	120% of Rated Current.	30.
18	Power Frequency withstand voltage kV.	3kV for 1 Sec.
19	Short Time withstand current kA/sec.	10kA for 1 Sec.
20	Core Material.	CRGO Silicon Steel M4 Grade.
21	Copper wire material.	Super Enameled Copper Wire.
22	Cross Section of Primary Bus bar.	Drawings provided below.
23	Cross Section of Secondary Winding.	1.6sq.mm.
24	Dimensional Drawing submitted.	Yes/No.
25	Type Test Certificate as per IS 2705:1992 submitted in complete from NABL accredited lab.	Yes/No
26	Tenderer shall agree to Specification Clause No 6.0, 7.0, 8.0 & 9.0.	Yes/No







TECHNICAL SPECIFICATION FOR LT CT for DT Meters

GENERAL

This specification covers manufacture, test, & supply of LT Current transformers of class 0.5 accuracy.

The CTs shall be suitable for metering purpose.

TYPE:

The CTs shall be of ring type or window type (bar type or bus-bar type CT's shall not be accepted).

The secondary leads shall be terminated with Tinned Cooper rose contact terminals with arrangements for sealing purposes.

Polarity (both for primary and second leads) shall be marked.

The CTs shall be varnished, fiberglass tape insulated or cast resin, air-cooled type. Only super enameled electrolytic grade copper wires shall be used.

The CTs shall conform to IS 2705:Part-I & II/IEC:185 with latest amendments.

TECHNICAL DETAILS:

Technical details shall be as given below:

1.	Class of Accuracy	0.5s
2.	Rated Burden	5.00 VA
3.	Power Frequency Withstand Voltage	3KV
4.	Highest System Voltage	433 V
5.	Nominal System Voltage	400 V
6.	Frequency	50 Hz
7.	Supply System	3 Ph. Solidly grounded Neutral System

Transformation ratio shall be specified from the following standard ratings as per requirement :

Ratio	**1000/5**	**1500/5**

(Secondary with 1 A may be specified by the utility incase the same is desired.)

Bore diameter of the CT shall not be less than 60 mm. Ring type CTs shall have suitable clamp to fix the CT to panel Board, wherever required.

The limits of current error and phase angle displacement as per IS:2705 at several defined percentage of rated current are:

Accuracy Class	% Ratio error at % of rated current				Phase displacement in minutes at % of rated current			
	5	20	100	120	5	20	100	120
0.5	1.5	0.75	0.5	0.5	90	45	30	30

Note : Current error and phase displacement at rated frequency is required to be as above when the secondary burden from 25% to 100% of the rated burden i.e. 50 V A.

Rated extended primary current shall be 120% of rated primary Current in accordance with IS:2705 Pt-II.

Rated ISF (Instrument Security Factor) shall be declared by the manufacturer & marked on the CT.

CT's shall be made with good engineering practices. Core winding shall evenly spread stress & avoid stress concentration at any one point. Cast resin CT's sha;; be processed by hot curing method under controlled vacuum conditions.

The base shall be of hot dip galvanised steel.

4.0 TESTS:

4.1. TYPE TESTS:

4.1.1 Copies of all type tests as per IS.2705 Part-I and II including short time current & temperature rise tests in NABL accredited laboratory shall be submitted and got approved before commencement of supply.

ROUTINE TESTS:

4.2.1 The supplier shall conduct all the routine tests such as Ratio test, phase angle error test for 0.5 accuracy class as per IS 2705 Part I & II.

COMMISSIONING TEST :

In accordance with IS:2705, Power frequency test on primary winding shall be carried out after erection on site on sample basis.

MARKING :

The CTs shall have marking and nameplate as per IS 2705 in addition to class of insulation & ISF. The markings shall be indellible. The nameplate shall be securely fixed to the body of the CT.

PACKING:

Each CT shall be securely packed so as to withstand rough handling during transit and storage.

QUALITY ASSURANCE PLAN:

The requirements of clause 29.0 of Section – I of main specification for Energy Meters shall apply.

Annexure D Three phase CT/PT operated alternating current Smart Meter of Accuracy Class0.5S/ 0.2S (as required) –Feeder Meter, Boundary Meter, HT Consumers, etc.

General Standards Applicable for Meter

Unless otherwise specified elsewhere in this specification, the performance and testing of the meters shall conform to the following standards and amendments/revisions thereof.

Sl. No.	Standard No.	Title
1	IS 16444: Part 2 with latest amendments	AC Static Transformer Operated Watt-hour and VAR-Hour Smart Meters, class 0.2S, 0.5S and 1S
2	CBIP- Publication 325 with latest amendments	Standardization of AC Static Electrical Energy Meters
3	CBIP Technical report no. 111 with latest amendments	Specification for Common Meter Reading Instrument
4	IS:9000 with latest amendments	Basic Environmental Testing Procedures for Electronic & Electrical Items.
5	IS 12063 with latest amendments	Degrees of protection provided by enclosures of electrical equipment.
6	IS 14451, Part-2: 1999 with latest amendments	Telemetering for consumption and demand. Direct digital transfer of meter values.
7	IS 4905: 1999 with latest amendments	Methods for Random sampling.
8	IS 12346 with latest amendments	Specifications for Testing Equipment for AC Energy meter.
9	IS 15959 Part 3 (as applicable) with latest amendments	Data exchange for electricity meter reading, tariff and load control: Companion specification

Communication

Meter shall have ability to communicate with HES on any one of the technologies mentioned in IS 16444 (RF/Cellular) in a secure manner. The selection of communicationtechnology should be as per the site conditions and as per design requirement of the AMISPto meet the Service Level Agreements (SLAs). In case of cellular based meter, the meter shall accommodate SIM Card / e-SIM of any service provider. The meter shall log the removal of the plug-in type communication module removal /nonresponsive event with snapshot.

Other Specifications

Particulars	Specifications
Applicable Standards	The meters shall comply with IS 16444: Part2 for all requirements except for those parameters which havebeen specifically mentioned to be otherwise in this specification.
Reference Voltage	[As per relevant IS]
Current Rating	Ib 5A Imax 10A
Starting Current	As per IS 16444: Part2
Accuracy	Class 0.2S as per IS 16444: Part 2
Limits of error	As per IS 16444: Part 2
Operating Temperaturerange	As per IS 16444: Part 2
Humidity	As per IS 16444: Part 2
Frequency	As per IS 16444: Part 2
Influence Quantities	As per IS 16444: Part 2
Power Consumption ofmeter excluding communication module	As per I S 16444: Part 2
Current and Voltage circuit	As per IS 16444: Part 2
Running at No Load	As per IS 16444: Part 2
Test output device	As per IS 16444: Part 2
Meter Display	As given in the document

Name Plate & marking Meter Display	Manufacturer's name Type designation Number of phases and wires Serial number (Meter serial number shall be laser printed on name plate instead on sticker). Serial number along with barcode Month and Year of manufacture Unit of measurement Reference voltage ,frequency Ref. temperature Rated basic and maximum Current Meter constant (imp/kWh) 'BIS' Mark Class index of meter

Particulars	Specifications
	Property of BEST Undertaking Purchase Order No. & date Guarantee period. Sign of double square Country of manufacture. Firmware version of meter Symbol of load switch. NIC serial NO (Shall be visible from Communication Module Slot) Compatibility of NIC Card.
Time of Use (In case of net-meter both export & import parameters to be measured)	As given in the document
Parameters to be measured	As per IS 16444: Part 2 / IS 15959: Part 3 (as applicable) RF/ GSM signal Strength in milli db to be available in instantaneous parameters. All energies and demand will be available TOD wise in billing/ LS parameters.
Power Quality Information	As per IS 15959: Part 3 (as applicable)
Maximum Demand	As per IS 15959: Part 3 (as applicable)
Load Survey/Interval Data	DIP: 15 min SIP: 15 min LS Days: 45 days
LED/LCD Indicators	As per IS 16444: Part 2
Tamper/Event recording	As given in the document

Alarm	As per IS 16444 / IS 15959: Part 3 (as applicable)
Measuring Elements	a. Current Transformer shall be provided as measuring element in the phase circuit. b. Additional CT/Shunt shall be provided in the neutral circuit of meter to detect phase CT bypass. Any unbalance current of vector summation of all three phase currents, if not recorded as neutral current, to be treated as tamper event, and also current imbalance to be detected. c. The meter shall have CTs with Magnetic shielding and same shall be tested separately prior to assembly. d. The Current Transformers used shall not saturate with passage of DC current as per IS: 13779:1999 with latest amendments.
Anti-Tamper features	The meter shall continue working under tamper conditions as defined in IS 15959 Part 3 and would log the event and send alarm at HES after logging of the defined tamper features as per IS 15959 Part 3. As given in the document
Programmability	As per IS 16444: Part 2
Communication	As per IS 16444: Part 2

Particulars	**Specifications**
Communication Protocol	As per IS 15959: Part 3 (as applicable)
Real time clock (RTC)	As per IS 16444: Part 2 / IS 15959: Part 3 (as applicable)
Data Retention	As per IS 16444: Part 2
Battery Backup	Meter shall be supplied with separate battery backup for RTC.
Data display facility (manual/Auto)	As given in the document
Remote Firmware Upgrade	As per IS 15959: Part 3 (as applicable)
Calibration	Meters shall be software calibrated at factory and modifications in calibration shall not be possible at site by any means. However parameters like RTC, TOD slots & timings, DIP (billing & load survey), billing date change, Pre paid/post paid, Set metering mode (Import/Export), display setting, shall be reconfigure through CMRI and remotely over the air (OTA), and any other support will be provided without any additional cost to BEST till the useful life of the meters.
Meter Dimension in MM	Is not more than 250L*200W*100H

Software and communication compatibility	The bidder shall supply software required for communication though local (CMRI and BCS software) and remote (AMI) connectivity free of cost and necessary training. For existing meter manufacturer, it should be ensured that all meters (existing non- smart & upcoming smart meters) can be read through one BCS only. The list of OBIS codes for the parameters is provided in the document. There shall be facility to export the data in Excel/txt/csv/PDF and XML format.
KVAH & KVA calculation	Meter shall be programed as Lag+ Lead configuration i.e. Leading PF shall not be considered as unity
Plug-in Communication Module	The Smart Meters shall be have a dedicated sealable slot for accommodating plug-in type bi -directional communication module which shall integrate the respective communication technology (RF Mesh/ Cellular) with the Smart Meters, leading to easy adaptability for network interfaces (WAN/NAN).The Plug-In module shall be field hot swappable/ replaceable. Same NIC shall work with different types of meters of same make (1P, 3P, LTCT, HT etc).
Optical Port	The meter shall have optical port for downloading data. Optical port shall be with a rust resistance coated metal ring to hold magnet of downloading probe. The optical head used for meter reading shall comply with IEC 62056-21 as far as physical construction is concerned. 10 Nos. of optical chords shall be provided for downloading the data from Meter to PC using BCS software in the Lab. The Optical Port provided on meter shall have flap & sealing provision.
Internal component specification	AS given in the document

Data display facility (auto/manual)

As given in the annexure of the document
Meter display should not go in to sleep mode during Power-On condition in case the push button is notoperated for more than 10 minutes.

TOD Feature:

The meter shall be capable of measuring Cumulative Energy (KWh), KVarh Lag, Kvarh Lead, Kvah and MD (KW, KVA)with time of day (TOD) registers having 5 zones (no. of zones & time slot shall be programmable by CMRI with adequate security level). TOD Slot Configuration shall be as follows-

Slot	Time Slots
TOD 1	22 to 06 Hrs
TOD 2	06 to 09 Hrs

TOD 3	09 to 12 Hrs
TOD 4	12 to 18 Hrs.
TOD 5	18 to 22 Hrs

Immunity against external influencing signals: Magnetic Field:

Meter shall record accurate energy in case of any external influencing signals in line with IS 13779:1999 Cl.11.2 and variation in limits of error (upto 100% Imax) shall be as per the table 13 of IS 14697. Meter shall be immune to magnetic field such that it shall not affect the normal overall functionality However, in case of abnormal magnetic field as defined below meter shall perform as per the following features:

a) Meter shall log the event in its memory as" MAGNET" with date and time stamp within 30 sec or immediate of application of abnormal magnetic field and shall start recording at 100% Imax and after removal of magnet, back to normal recording within 30 sec or immediate.
b) Meter shall show "Magnet" in the display.

Abnormal Magnetic field is defined as below;

a) Continuous DC magnetic induction: >0.20 Tesla ± 5%(Value of the magneto motive force to be applied shall be generally >10000 ATs, Should be immune up to 0.20Tesla)
b) AC magnetic induction: Immune for 10 milli Tesla (if produced with circular metal core with square cross section as specified in CBIP latest report with 2800 AT
c) Permanent Magnet: Immune up to 0.5T and Event logging >0.5T

Electrostatic Discharge (ESD)

Meter shall be immune up to 50 kV and shall record accurate energy as per IS-13779:1999.Meter shall log the event into memory as 'ESD' with date & time stamp for any ESD greater than 50 kV and shall show 'ESD' in the display.
The shielding around the meter shall be such that it does not get affected by high voltage, high and low energy impulse when comes in contact with meter from any side.
The meter should immune to high/ low frequency Jammer devices. Meter shall log event in its memory as jammer with date and time stamp along with snapshot.

The meter should be immune and log the tamper on application of any other higher magnetic field of any frequency waves, micro waves

Neutral Disturbance

The meter shall log in the memory as 'NEUTRAL DISTURBANCE' with date and time stamp and show 'ND' in the display for Frequency variation below 45 Hz and above 55 Hz with time delay of 2 min and for Pulsating DC and Chopped AC of any value with time delay of 2 min.

The meter shall not saturate on passage of direct current, which can cause the meter either to stop recording/ record inaccurately. DC injection shall be tested both in phase and neutral. Measurement by meter shall not get influenced by injection of DC signal/ DC pulse upto 330V and for any value beyond this, the meter shall log the event into memory as 'NEUTRAL DISTURBANCE' with date & time stamp and shall show 'ND 'in the display after time delay of 2 min(occurrences and restoration time).

The meter shall record energy proportional to the current and V Ref when any of the tamper circuits are used to tamper energy using a diode or a variable resistance or a variable capacitance energy saving device. The measurement by meter shall not get influenced by injection of AC Voltages/Chopped signal/DC signal/ DC pulse of low frequency and harmonics. The meter should be immune to such Neutral Disturbance. In case the meter accuracy is disturbed under Neutral Disturbance, it should be able to log the event.

Abnormal and Tamper conditions

The meter shall record forward energy under any abnormal conditions.
All the tamper events i.e. shall be logged in the memory of the meter with date and time stamp of occurrence and restoration along with instantaneous electrical parameter (Voltage, Current (phase and neutral) , energy, PF , frequency)

Meter shall store cumulative count and cumulative durations all the tamper event which have logged by meter from the date of energization till life of meter.

Tamper count shall be incremented only on the occurrence of the any tamper event with date and time
Stamp on FIFO basis. The event which is not restored should not be removed from its meter memory and
FIFO should not applicable for unrestored event.
The cover open tamper detection should be through heavy duty, sturdy micro switch such that it should not
Operate on vibration or impact during handling or testing.
The meter shall register correctly if supply neutral is not available at the meter neutral terminal. The meter shall work in absence of two incoming wires. It shall keep recording correctly in case of unbalance system voltage.

The meter shall keep working accurately irrespective of the phase sequence of the supply.

The meter shall be able to differentiate between actual CT reversals and condition arising out of unbalanced / unhealthy capacitor bank.

During Voltage Failure event, the meter shall record energy proportional to the current and V Ref (240V).
Meter shall have neutral CT for tamper identification and analysis.
The event compartments shall be IS 15959 Part-1 table 9. The size of compartments should be such that all above event are accommodated in the assigned event compartment.
i.e. if in case of voltage compartment assigned to 4 number of events then the minimum size of this compartment should be such that it should accommodate sum of all maximum number of events as per below table. Transaction event compartment size shall be minimum 100 events

Sr. No.	Tampers/ Failures	Phase wise	Compartment Size	Logic/ Condition other than standard	Persistence time	
					Occ Time (min)	Rec Time (min)
1	Voltage Failure	YES	25	Occ: Voltage <50 V: and current > 2% Ib. Res: Vph ≥50 V (Independent of current)	5	5
2	Voltage unbalance	NO	25	Occ : (Vmax-Vph)>10% Vn and Vphase : 50 V<Vphase> 69 V Res : (Vmax-Vph)<10% Vn and Vphase : 50 V<Vphase> 69 V	5	5
3	High Voltage	YES	25	Vph > 110% of Vref	30	30
4	CT open	YES	25	Occ: Iph < 1%Ib, >5% Ib in any of the other two phases (Ex: if Rph <1% of Ib, Y or B should be > 5% Ib) Res: Iph > 1% Ib in tampered phase	30	30
5	Current unbalance	NO	25	Occ : Imax – Imin > 30% of Iavg Res : Imax – Imin < 30% of Iavg	15	15
6	CT Bypass	YES	25	Occ: Iph < 1%Ib Res: Iph > 2% Ib	30	30
7	Current reversal	YES	25	1. Active current negative 2. PF > 0.3	2	2

Sr. No.	Tampers/ Failures	Phase wise	Compartment Size	Logic/ Condition other than standard	Persistence time	
					Occ Time (min)	Rec Time (min)

8	Magnet	NO	25	Whenever meter sense magnetic field it shall record Active and Apparent energy at Imax at UPF	Immediate	Immediate
9	Neutral Disturbance	NO	25	Vph > 150% Vref In case of external signal injection (Chopped DC, Chopped AC and DC injection through diode)	5	5
10	ESD/JAMMER	NO	25	Occ: Immunity upto 50 KV, > 50KV event logged In memory Res: Removal of ESD and Jammer Device	2	2
11	Low PF Tamper	YES	25	PF < +/- 0.5	5	5
12	Top Cover open	NO	5	When cover opens by more than 2 to 4 mm.	Immediate	NA
13	Invalid Phase Association	NO	5	IF invalid phase association	5	5
14	NIC card Removed (Immediate)	NO	25	OCC: On removal of card RES: On Inserction card	Immediate	Immediate
15	Power On/Off	NO	25	Occ: Actual voltage OFF Res: Actual voltage ON	5	5

In case of Bi-directional meters current reversal and magnet tamper conditions to be made accordingly.

Anti-tamper features

The meter shall continue recording energy under tamper conditions as defined in IS 15959 Part 2 and would log the event and send alarm at Head End System after detection of the defined tamper features as per IS 15959 Part 2.

Type Tests & Test Certificates

Smart Meter shall be type tested for tests as per relevant parts of IS 16444 (latest versions), and certified by Indian Standard wise list of BIS recognized labs as available at https://bis.gov.in/index.php/laboratorys/list-of-bis-recognized-lab/. The number of sampling for testing of meters and criteria for conformity would be as per IS 16444(as amended up to date). Necessary copies of test certificates shall be submitted as per agreement with the Utility/AMI-IA.

Routine & Acceptance Tests

The Factory Acceptance and Routine tests shall be carried out as per IS 16444 Part 1.

General & Constructional requirements

Meter shall be BIS marked as per IS 16444 Part 1. General & construction requirement shall be as per IS 16444/IS 13779

Meter base & cover - Meter base & cover shall be as per IS 16444 Part1 / IS 13779. The meter Base& cover shall be 'Break to open' design. The material for meter base and cover shall be made of high-grade polycarbonate.

The meter Base & cover shall be ultrasonically welded / Chemically welded or other suitable bonding technology and it will not be possible to remove the cover from the base without evidenceof damage

Terminal block & cover - As per IS 16444 Part 1/IS 13779

The terminal cover shall be transparent and short. The terminal cover shall be fully enclosed type.

The connection diagram shall be marked on Terminal Block cover.

Design

Voltage circuit, sealing arrangement, terminal block, terminal cover and nameplate etc. shall be in accordance with IS-16444 Part 1 (latest version). The meter shall be compact and reliable in design,easy to transport and immune to vibration and shock involved in transportation and handling

Name plate and marking

The meter should bear a name plate clearly visible, effectively secured against removal and indelibly/distinctly marked in accordance with relevant IS. In addition, "Name of the Utility/AMI-IA", purchase order no. & year/month of manufacturing shall be provided on the meter name plate. The rating plate information shall be as per relevant IS.

Connection diagram: As per IS 16444 Part 1

Fixing arrangements:

The meter shall be mounted type. The Meter should have three fixing holes, one at top and two at the bottom. The Top hole should be such that the holding screw is not accessible to the consumer after fixing the meters. The lower screws should be provided under sealable terminal cover. The requisite fixing screws shall be supplied with each meter.

Sealing arrangement:

Arrangements shall be provided for proper sealing of the meter cover so that access to the working parts shall not be possible without breaking the seal. The sealing arrangement and number of seals shall be as per relevant IS/ requirement of

Utility/AMI-IA.

The sealing point shall be as per CEA regulation 2006 with latest amendments. Supplier shall fix tamper evident barcoded holographic seal on left side of the meter. It shall not be possible to remove the seal intact. Details of holographic seals used by supplier shall be provided in hard as well as in soft copy on CD/email as per format given by BEST. Additional seals will be provided by BEST to supplier for putting them on meter body as per requirement.

Meter box:

The Meter Box if required by Utility/AMI-IA/purchaser, would be provided as per requirement of the Utility/AMI-IA/ purchaser and the material of the Meter Box should be such that it does not hamper communications.

Packing

- The meters shall be suitably packed for vertical/horizontal support to withstand handling duringtransportation.
- The meter shall be packed appropriately to ensure safe transportation, handling, identificationand storage.
- All packing materials shall be as per environment law in force. The primary packing shall ensure protection against humidity, dust, grease and safeguard the meter’s performance until its installation.
- The secondary packing shall provide protection during transportation.
- The packing case shall indicate “Fragile in nature” and direction of placement of box.
- The packing shall indicate marking details like Manufacturer’s name, meters #s, quantity, etc.

Transportation

- The meter shall be compact in design. The meter block unit shall be capable of withstandingstresses likely to occur in actual service and rough handling during transportation.
- The meter shall be convenient to transport and immune to shock and vibration duringtransportation and handling.
- The meter should not be exposed to undue shock and mishandling during transportation.

- The stacking of box inside transport media should be such as to avoid their free movement.

- The packing should also be protected from rain and dust by transport media.
- The AMISP shall be responsible for any damage during transit due to inadequate or improperpacking.

Testing and Manufacturing Facilities at Manufacturer's Place

The manufacturer shall have facilities of conducting Acceptance Testing as per IS 16444Part 1.

Inspection

- The meters shall be sealed as per the mutual agreement of the supplier and the purchaser
- The Utility/AMI-IA/ purchaser may inspect the meter randomly as per sampling plan for acceptance testas per IS 16444 Part 1. The meters shall be tested for acceptance test as per IS 16444 Part 1
- All meters are factory tested at manufacturer's work place and RTR (Routine Test Report) to be submitted to BEST for each meters in soft copy before dispatch of meters.

Tender sample

- Tenderer shall submit 3 sample meters out of which one sample meter shall be without Ultrasonic welding to confirm constructional features and other destructive tests if any.
- After successful passing the tests carried out at BEST laboratory the tenderer shall give the demonstration of the meter offered against the tender to demonstrate the features incorporated in the meter.
- Sample meter submitted against the tender will not be returned to the supplier till the completion of guarantee period.

Guarantee.

- 7.5 years from the date of dispatch or 7 year from date of commissioning, whichever is earlier
- Manufacturer shall undertake a guarantee to replace meter up to a period of 7 Year from the date of supply. The meters which are found defective/inoperative within the guarantee period shall be replaced as per meter service level agreement.

Internal component specification

Sr No	Component function	Requirement	Preferable Makes and Origin

Sr No	Component function	Requirement	Preferable Makes and Origin
1	Measurement or Computing Chips.	The measurement or Computing chips used in the meter shall be with the Surface mount type along with Application Specific Integrated Circuits (ASIC).	USA: Analog Devices, Cyrus, Logic, Atmel, Philips, Teridian, Dallas, ST, Texas Instruments, Motorola, Maxim, National Semiconductors, Freescale, On semiconductors. Germany: Siemens. South Africa: SAMES. Japan: NEC, Toshiba, Renasas, Hitachi. Austria: AMS. Holland: Philips (NXP).
2	Memory Chips.	The memory chips shall not be affected by external parameters like sparking, high voltage spikes or electrostatic discharges.	USA: Atmel,Teridian, National Semiconductors, Philips Texas Instruments, ST, Microchip, Spanson (Fujitsu), Ramtron. Japan: Hitachi, Renasas, Oki. Germany: Siemens.
		Meter shall have Non-Volatile Memory (NVM) to store energy meter data.	
		NVM shall be external (Outside ASIC).	
		In case of input power fail to Energy Meter it shall record last sampled important data in EEPROM using capacitance tank of power supply. Use of Non-rechargeable battery should only be restricted to minimum absolute power requirement of meter. Non-rechargeable battery shall not be used for this function.	
3	Display Modules.	The display modules shall be well protected from the external Ultra Violet (UV) radiations.	Display Make:- Singapore: E-smart, Bonafied Technologies, Display Tech. Korea: Advantek, Jebon, Union Display Inc. Japan: Hitachi, Sony, L&G. Malaysia: Crystal ClearTechnology. Holland/Korea: Phillips. Hongkong: Genda. China: Tianma, JIA.
		The display visibility shall be sufficient to read the meter mounted at height of 0.5 meter as well as at the height of 2 meters.	

Sr No	Component function	Requirement	Preferable Makes and Origin
		The construction of the modules should be such that the displayed quantity shall not disturbed with the life of display (PIN Type).	
		It shall be trans reflective STN (STN – Super Twisted Nematic (160°) type industrial grade with extended temperature range.	
4	Optical Port.	Optical port shall be used to transfer the meter data to Common Meter Reading Instrument (CMRI/ DCU). The mechanical construction of the port shall be such to facilitate the data transfer easily.	USA: National Semiconductors, HP, Optonica, ST. Holland/Korea: Phillips. Japan: Hitachi. Taiwan: Ligitek. Osram, Everlight, Liteon, Avego.
5	Electronic Components.	The active and passive components shall be of the surface mount type and are to be handled and soldered by the state of art assembly processes. The Plated Through Hole (PTH) component should be positioned such a way that the leads of the component shall not be under stress and not touching the internal wires.	USA: National Semiconductors, Atmel, Philips, Texas Instruments, BC Component, Analog devices, ST, Maxim, Kemet, On semiconductors, Freescale, Intersil, Raltron, Fairchild, Muruta, Agilent, AVX, Abracon, Sipex, Diode Inc., Honeywell, Power Integration, Fox, Roham, Onsemi. Japan: Hitachi, Oki, AVZ or Ricoh, Toshiba, Epson, Kemet, Alps, Muruta, TDK, Sanyo, Samsung, Panasonic. Korea: Samsung. India: Keltron, Incap, VEPL, PEC, RMC, Gujarat Polyavx, Prismatic, MFR Electronic components Pvt. Ltd, Cermet. Germany: Vishay, Epcos, Diotech, Kemet.
6	Battery.	Non rechargeable Lithium battery with guaranteed life of about 10 years shall be used.	Varta, Tedirun, Sanyo or National, Panasonic, Tekcell, Vitzrocell, Mitsubishi.
		Battery for RTC and for Meter Display in absence of Power shall be Separate.	
7	RTC.	The accuracy of RTC shall be as per relevant IEC/IS standards.	USA: Philips, Dallas Atmel, Motorola, Microchip, Maxell, Renata Japan: NEC or Oki.

8	Measuring Element.	Measuring elements used shall be as per Clause No. 8.11 of the specification.	
9	Power Supply.	The power supply shall be with the capabilities as per the relevant standards.	
		The power supply unit of the meter shall not be affected in case the maximum voltage of the system appears to the terminals due to faults or due to wrong connections.	
		The ratings of Power Supply module and power consumed by various modules and circuits shall be specified.	
		The power supply shall be at least 125% rated than the maximum load on the power supply.	
		In case of capacitive power supply, the voltage rating of series power circuit capacitor shall be adequate to withstand 440V AC applied at meter terminals continuously for 5 minutes without damage.	
		All the electrolytic capacitors shall have preferably low ESR value.	
10	Electrical Components.	The internal electrical component shall be of electrolytic copper & shall be protected from corrosion, rust etc.	
11	Mechanical Parts.	The other mechanical components shall be protected from corrosion etc. by suitable plating/painting methods.	
12	P.C.B.	Glass Epoxy, fire resistance grade FR4 with adequate strength.	
		PCB shall be Bare Board Test (BBT) certified.	
		The meter shall preferably with minimum jumper/wires/connectors.	

Sr No	Component function	Requirement	Preferable Makes and Origin
		PCB shall be suitably Masked with protection coating.	
13	Push Button.	Carbon pill and silicon rubber contact / Tactile/ Captive Push button type high performance push buttons shall be used.	
14	Magnetic Tamper Detection Sensor.	Hall Effect IC/Inductor Sensor shall be used.	Make-Diode, Allegro etc.

DISPLAY PARAMETERS

Meter Display Sequence of HT CTPTO SMART METER

Meter shall have at least three display modes for showing display parameters. Auto mode shall be as Default in which parameters will scroll at the interval of 10 seconds. Minimum 7 digit integers for energy parameters shall be provided.

1 **Auto Mode**:

The offered meter shall be capable of recording and displaying following readings in Auto mode display. The display shall follow the following sequence as mentioned below in interval of 10 seconds automatically.

Minimum 7-digit integers for energy parameters shall be provided.

Sequence	Display
1	Complete LCD Test.
2	Meter Number.
3	Present Time.
4	Present Date.
5	Current kWh.
6	Current kWh for ToD 1
7	Current kWh for ToD 2
8	Current kWh for ToD 3
9	Current kWh for ToD 4
10	Current kWh for ToD 5
11	Current kVAh.
12	Current kVAh for ToD 1
13	Current kVAh for ToD 2
14	Current kVAh for ToD 3
15	Current kVAh for ToD 4
16	Current kVAh for ToD 5
17	Current Total kVARh lag.
18	Current Total kVARh lead.
19	Current Max MD in kVA with date and time for ToD 1
20	Current Max MD in kVA with date and time for ToD 2
21	Current Max MD in kVA with date and time for ToD 3
22	Current Max MD in kVA with date and time for ToD 4
23	Current Max MD in kVA with date and time for ToD 5
24	Instantaneous Power Factor.
25	Instantaneous R ph Voltage.
26	Instantaneous Y ph Voltage.
27	Instantaneous B ph Voltage.

28	Instantaneous R ph Current.
29	Instantaneous Y ph Current.
30	Instantaneous B ph Current.
31	Neutral Current.
32	Instantaneous kW load.
33	Instantaneous kVAr load.
34	Instantaneous KVA load.
35	Instantaneous Frequency.

After last sequence, the first sequence shall be automatically displayed.

2 Push Button Mode:-

Following parameters shall be displayed on pressing the buttons (Scroll up & down):-

Sequence	Display
1	Segment Check Display (LCD Test)
2	BEST Meter Serial Number.
3	Real Time
4	Real Date
5	Bill kWh
6	Bill kWh for ToD 1
7	Bill kWh for ToD 2
8	Bill kWh for ToD 3
9	Bill kWh for ToD 4
10	Bill kWh for ToD 5
11	Bill kVAh.
12	Bill kVAh for ToD 1
13	Bill kVAh for ToD 2
14	Bill kVAh for ToD 3
15	Bill kVAh for ToD 4
16	Bill kVAh for ToD 5
17	Bill kVARh–Lag.
18	Bill kVARh–Lead.
19	Bill MD in kVA with date and time for TOD1
20	Bill MD in kVA with date and time for TOD2
21	Bill MD in kVA with date and time for TOD3.
22	Bill MD in kVA with date and time for TOD4
23	Bill MD in kVA with date and time for TOD5.
24	Bill Average Power Factor.
25	Cumulative MD Total.
26	Cumulative MD in kVA with date and time for TOD1
27	Cumulative MD in kVA with date and time for TOD2.

28	Cumulative MD in kVA with date and time for TOD 3
29	Cumulative MD in kVA with date and time for TOD 4
30	Cumulative MD in kVA with date and time for TOD 5.
31	MD Reset Count.
44	Last Magnetic Tamper event date and time.
45	Current MD in kVA with date and time.

Meter Display Sequence of NET SMART METER

1 Auto Mode:-

Sequence	Display
1	Complete LCD Test
2	BEST Meter Serial Number.
3	Present Date
4	Present Time
5	Current CKWh Reading (Import)
6	Current CKVAh Reading while Active (Import)
7	Current CRKVAh Reading Lag (Import)
8	Current CRKVAh Reading Lead (Import)
9	Current KWh Reading for TOD1 (Import)
10	Current KWh Reading for TOD2 (Import)
11	Current KWh Reading for TOD3 (Import)
12	Current KWh Reading for TOD4 (Import)
13	Current KWh Reading for TOD5 (Import)
14	Current KVAh Reading for TOD1 (Import)
15	Current KVAh Reading for TOD 2 (Import)
16	Current KVAh Reading for TOD 3 (Import)
17	Current KVAh Reading for TOD 4 (Import)
18	Current KVAh Reading for TOD 5 (Import)
19	Current Maximum Demand with date and time in KVA of Billing Period for TOD1 (Import)
20	Current Maximum Demand with date and time in KVA of Billing Period for TOD2 (Import)
21	Current Maximum Demand with date and time in KVA of Billing Period for TOD3 (Import)
22	Current Maximum Demand with date and time in KVA of Billing Period for TOD4 (Import)
23	Current Maximum Demand with date and time in KVA of Billing Period for TOD5 (Import)
24	Current CKWh Reading (Export)
25	Current CKVAh Reading while Active (Export)

26	Current CRKVAh Reading Lag (Export).
27	Current CRKVAh Reading Lead (Export).
28	Current KWh Reading for TOD1 (Export)
29	Current KWh Reading for TOD2 (Export)
30	Current KWh Reading for TOD3 (Export)
31	Current KWh Reading for TOD4 (Export)
32	Current KWh Reading for TOD5 (Export)
33	Current KVAh Reading for TOD1 (Export)
34	Current KVAh Reading for TOD 2 (Export)
35	Current KVAh Reading for TOD 3 (Export)
36	Current KVAh Reading for TOD 4 (Export)
37	Current KVAh Reading for TOD 5 (Export)
38	Current Maximum Demand with date and time in KVA of Billing Period for TOD1 (Export)
39	Current Maximum Demand with date and time in KVA of Billing Period for TOD2 (Export)
40	Current Maximum Demand with date and time in KVA of Billing

Sequence	Display
	Period for TOD3 (Export)
41	Current Maximum Demand with date and time in KVA of Billing Period for TOD4 (Export)
42	Current Maximum Demand with date and time in KVA of Billing Period for TOD5 (Export)
43	Instantaneous Power Factor
44	Instantaneous R ph Voltage.
45	Instantaneous Y ph Voltage
46	Instantaneous B ph Voltage.
47	Instantaneous R ph Current.
48	Instantaneous Y ph Current
49	Instantaneous B ph Current.
50	Neutral Current.
51	Instantaneous Active kW load. (Import/Export)
52	Instantaneous Apparent kVA load. (Import/Export)
53	Instantaneous Reactive KVAr load. (Import/Export)
54	Instantaneous Frequency.

Push Button Mode:-

Sequence	Display
1	Complete LCD Test
2	BEST Meter Serial Number.
3	Present Date

4	Present Time
5	Cumulative KWh Reading at Bill Point (Import)
6	Cumulative KVAh Reading at Bill Point (Import)
7	Cumulative RKVAh Reading Lag at Bill Point (Import)
8	Cumulative RKVAh Reading Lead at Bill Point (Import)
9	Cumulative KWh Reading for TOD1 at Bill Point (Import)
10	Cumulative KWh Reading for TOD 2 at Bill Point (Import)
11	Cumulative KWh Reading for TOD 3 at Bill Point (Import)
12	Cumulative KWh Reading for TOD 4 at Bill Point (Import)
13	Cumulative KWh Reading for TOD 5 at Bill Point (Import)
14	Cumulative KVAh Reading for TOD1 at Bill Point (Import)
15	Cumulative KVAh Reading for TOD2 at Bill Point (Import)
16	Cumulative KVAh Reading for TOD3 at Bill Point (Import)
17	Cumulative KVAh Reading for TOD 4 at Bill Point (Import)
18	Cumulative KVAh Reading for TOD 5 at Bill Point (Import)
19	Maximum Demand in KVA with date and time of Billing Period for TOD1 (Import).
20	Maximum Demand in KVA with date and time of Billing Period for TOD2 (Import).
21	Maximum Demand in KVA with date and time of Billing Period for TOD3 (Import).
22	Maximum Demand in KVA with date and time of Billing Period for TOD4 (Import).
23	Maximum Demand in KVA with date and time of Billing Period for TOD5 (Import).
24	Bill Average Power Factor (I).
25	Cumulative KWh Reading at Bill Point (Export).

Sequence	Display
26	Cumulative KVAh Reading at Bill Point (Export)
27	Cumulative RKVAh Reading Lag at Bill Point (Export)
28	Cumulative RKVAh Reading Lead at Bill Point (Export)
29	Cumulative KWh Reading for TOD1 at Bill Point (Export)
30	Cumulative KWh Reading for TOD 2 at Bill Point (Export)
31	Cumulative KWh Reading for TOD 3 at Bill Point (Export)
32	Cumulative KWh Reading for TOD 4 at Bill Point (Export)
33	Cumulative KWh Reading for TOD 5 at Bill Point (Export)
34	Cumulative KVAh Reading for TOD1 at Bill Point (Export)
35	Cumulative KVAh Reading for TOD2 at Bill Point (Export)
36	Cumulative KVAh Reading for TOD3 at Bill Point (Export)
37	Cumulative KVAh Reading for TOD 4 at Bill Point (Export)
38	Cumulative KVAh Reading for TOD 5 at Bill Point (Export)
39	Maximum Demand in KVA with date and time of Billing Period for TOD1 (Export).
40	Maximum Demand in KVA with date and time of Billing Period for TOD2 (Export).
41	Maximum Demand in KVA with date and time of Billing Period for TOD3 (Export).
42	Maximum Demand in KVA with date and time of Billing Period for TOD4 (Export).
43	Maximum Demand in KVA with date and time of Billing Period for TOD5 (Export).
44	Bill Average Power Factor (E).
45	MD Reset Count.
	*Bill point Reading means Reading on First Day of the month at 00.00 hrs and Billing period means for period of last month.

The Auto mode (default display) shall switch to Push button mode display (On Demand Display Mode) after pressing the push button.
The Push Button display mode shall switch over to Auto mode display (default display) if the push button is not operated for 15 seconds.
Display of MD (kVA or kW) shall have 3-digit integer and 3 digit decimal and display of cumulative MD shall have 5 digit integer and 2 digit decimal.

Instantaneous values of lead Power Factor shall be shown with negative sign while lag PF shall be shown without sign on the display
High Resolution Mode
Following parameters shall be displayed in High Resolution Mode with 3 digit integer +4 digit decimals.

Sequence	Display
1	KWh Reading (Import).
2	RKVAh Reading Lag (Import).
3	RKVAh Reading Lead (Import).
4	KWh Reading (Export).

5	RKVAh Reading Lag (Export).
6	RKVAh Reading Lead (Export).
7	KVAh Reading (Import).
8	KVAh Reading (Export).

The Auto mode display (default display) shall switch to High Resolution Display Mode after pressing the push button continuously for 10 seconds.

The High Resolution Display Mode shall switch over to Auto mode (default display) if the push button is not operated for 60 seconds

ANNEXURE-B4

OBIS CODES-IMPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
1	Instantaneous R ph Voltage.	1.0.32.7.0.255	1.0.32.7.0.255
2	Instantaneous Y ph Voltage.	1.0.52.7.0.255	1.0.52.7.0.255
3	Instantaneous B ph Voltage.	1.0.72.7.0.255	1.0.72.7.0.255
4	Instantaneous R ph Current.	1.0.31.7.0.255	1.0.31.7.0.255
5	Instantaneous Y ph Current.	1.0.51.7.0.255	1.0.51.7.0.255
6	Instantaneous B ph Current.	1.0.71.7.0.255	1.0.71.7.0.255
7	Instantaneous Power Factor.	1.0.13.7.0.255	1.0.13.7.0.255
8	THD R ph Voltage	1.0.32.7.124.255	1.0.32.7.124.255
9	THD Y ph Voltage	1.0.52.7.124.255	1.0.52.7.124.255
10	THD B ph Voltage	1.0.72.7.124.255	1.0.72.7.124.255
11	THD R ph Current.	1.0.31.7.124.255	1.0.31.7.124.255
12	THD Y ph Current.	1.0.51.7.124.255	1.0.51.7.124.255
13	THD B ph Current.	1.0.71.7.124.255	1.0.71.7.124.255
14	Displacement Power Factor.	Not Specified	Not Specified
15	Instantaneous 3ph kW load (Import).	1.0.1.7.0.255	1.0.1.7.0.255
16	Instantaneous 3ph kVAr load with lag lead indication (Import).	1.0.3.7.0.255	1.0.3.7.0.255
17	Instantaneous 3ph KVA load (Import).	1.0.9.7.0.255	1.0.9.7.0.255
18	THD Active Power R ph	1.0.35.7.124.255	1.0.35.7.124.255
19	THD Active Power Y ph	1.0.55.7.124.255	1.0.55.7.124.255
20	THD Active Power B ph	1.0.75.7.124.255	1.0.75.7.124.255
21	Active Power Total R ph	1.0.21.7.0.255	1.0.21.7.0.255
22	Active Power Total Y ph	1.0.41.7.0.255	1.0.41.7.0.255
23	Active Power Total B ph	1.0.61.7.0.255	1.0.61.7.0.255
24	Active Power Fundamental R ph	1.0.130.7.0.255	1.0.130.7.0.255
25	Active Power Fundamental Y ph	1.0.131.7.0.255	1.0.131.7.0.255

26	Active Power Fundamental B ph	1.0.132.7.0.255	1.0.132.7.0.255
27	Instantaneous Frequency.	1.0.14.7.0.255	1.0.14.7.0.255
28	Real Time Clock – Date and Time	0.0.1.0.0.255	0.0.1.0.0.255
29	Current Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255
30	Current kWh ToD 1 (Import).	Not Specified	1.0.1.8.1.255
31	Current kWh ToD 2 (Import).	Not Specified	1.0.1.8.2.255
32	Current kWh ToD 3 (Import).	Not Specified	1.0.1.8.3.255
33	Current kWh ToD 4 (Import).	Not Specified	1.0.1.8.4.255
34	Current kWh ToD 5 (Import).	Not Specified	1.0.1.8.5.255

OBIS CODES -IMPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	**BEST OBIS**
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
35	Fundamental Energy kWh.	Not Specified	1.0.1.8.1.255
36	Current Cumulative kVARh Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
37	Current kvarh Lag TOD1 (Import).	Not Specified	1.0.8.8.1.255
38	Current kvarh Lag TOD2 (Import).	Not Specified	1.0.5.8.2.255
39	Current kvarh – Lag TOD3 (Import).	Not Specified	1.0.5.8.3.255
40	Current kvarh – Lag TOD4 (Import).	Not Specified	1.0.5.8.4.255
41	Current kvarh – Lag TOD5 (Import).	Not Specified	1.0.5.8.5.255
42	Current Cumulative kvarh – Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
43	Current kvarh – Lead TOD1 (Import).	Not Specified	1.0.8.8.1.255
44	Current kvarh – Lead TOD2 (Import).	Not Specified	1.0.8.8.2.255
45	Current kvarh – Lead TOD3 (Import).	Not Specified	1.0.8.8.3.255
46	Current kvarh – Lead TOD4 (Import).	Not Specified	1.0.8.8.4.255
47	Current kvarh – Lead TOD5 (Import).	Not Specified	1.0.8.8.5.255
48	Current Cumulative kVAh (Import).	1.0.9.8.0.255	1.0.9.8.0.255
49	Current kVAh.TOD1 (Import).	Not Specified	1.0.9.8.1.255
50	Current kVAh.TOD2 (Import).	Not Specified	1.0.9.8.2.255
51	Current kVAh.TOD3 (Import).	Not Specified	1.0.9.8.3.255
52	Current kVAh.TOD4 (Import).	Not Specified	1.0.9.8.4.255
53	Current kVAh.TOD5 (Import).	Not Specified	1.0.9.8.5.255
54	Current MD in KVA with date & time (Import).	Not Specified	1.0.9.6.0.255
55	Current MD in kVA with date & time TOD 1 (Import).	Not Specified	1.0.9.6.1.255
56	Current MD in kVA with date & time TOD 2 (Import).	Not Specified	1.0.9.6.2.255
57	Current MD in kVA with date & time TOD 3 (Import).	Not Specified	1.0.9.6.3.255
58	Current MD in KVA with date & timeTOD4 (Import).	Not Specified	1.0.9.6.4.255

59	Current MD in KVA with date & timeTOD5 (Import).	Not Specified	1.0.9.6.5.255
60	MD Reset Count.	Not Specified	0.0.0.1.0.255
61	Cumulative MD Total.	Not Specified	1.0.9.2.0.255
62	Phase Sequence	Not Specified	1.0.96.7.30.255
63	Phase Angle 2	Not Specified	1.0.81.7.1.255
64	Phase Angle 3	Not Specified	1.0.81.7.2.255
65	Last Billing Date	0.0.0.1.2.255	0.0.0.1.2.255
66	RF/ GSM signal Strength in milli db	0.b.96.12.5.255	0.b.96.12.5.255

OBIS CODES - IMPORT MODE			
Billing Register		**DLMS**	**BEST proposed**
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255.	1.0.94.91.6.255
i	Month	0.0.0.1.2.255	0.0.0.1.2.255
ii	ToD wise Cumulative kWh ToD1 (Import).	1.0.1.8.1.255	1.0.1.8.1.255
	ToD2 (Import).	1.0.1.8.2.255	1.0.1.8.2.255
	ToD3 (Import).	1.0.1.8.3.255	1.0.1.8.3.255
	ToD4 (Import).	1.0.1.8.4.255	1.0.1.8.4.255
	ToD5 (Import).	1.0.1.8.5.255	1.0.1.8.5.255
iii	ToD wise Cumulative kVARh Lag ToD1 (Import).	Not Specified	1.0.5.8.1.255
	ToD2 (Import).	Not Specified	1.0.5.8.2.255
	ToD3 (Import).	Not Specified	1.0.5.8.3.255
	ToD4 (Import).	Not Specified	1.0.5.8.4.255
	ToD5 (Import).	Not Specified	1.0.5.8.5.255
iv	ToD wise Cumulative kVARh Lead ToD1 (Import).	Not Specified	1.0.8.8.1.255
	ToD2 (Import).	Not Specified	1.0.8.8.2.255
	ToD3 (Import).	Not Specified	1.0.8.8.3.255
	ToD4 (Import).	Not Specified	1.0.8.8.4.255
	ToD5 (Import).	Not Specified	1.0.8.8.4.255
v	ToD wise Cumulative kVAh ToD1 (Import).	1.0.9.8.1.255	1.0.9.8.1.255
	ToD2 (Import).	1.0.9.8.2.255	1.0.9.8.2.255
	ToD3 (Import).	1.0.9.8.3.255	1.0.9.8.3.255
	ToD4 (Import).	1.0.9.8.4.255	1.0.9.8.4.255
	ToD5 (Import).	1.0.9.8.5.255	1.0.9.8.5.255
vi	ToD wise Power factor ToD1 (Import).	Not Specified	1.0.13.0.1.255
	ToD2 (Import).		1.0.13.0.2.255
	ToD3 (Import).		1.0.13.0.3.255
	ToD4 (Import).		1.0.13.0.4.255
	ToD5 (Import).		1.0.13.0.5.255
vii	ToD wise MD in kVA with date & time ToD1 (Import).	1.0.9.6.1.255	1.0.9.6.1.255
	ToD2 (Import).	1.0.9.6.2.255	1.0.9.6.2.255
	ToD3 (Import).	1.0.9.6.3.255	1.0.9.6.3.255
	ToD4 (Import).	1.0.9.6.4.255	1.0.9.6.4.255
	ToD5 (Import).	1.0.9.6.5.255	1.0.9.6.5.255
viii	ToD wise MD in kW with date & time ToD1 (Import).	1.0.1.6.1.255	1.0.1.6.1.255
	ToD2 (Import).	1.0.1.6.2.255	1.0.1.6.2.255
	ToD3 (Import).	1.0.1.6.3.255	1.0.1.6.3.255
	ToD4 (Import).	1.0.1.6.4.255	1.0.1.6.4.255
	ToD5 (Import).	1.0.1.6.5.255	1.0.1.6.5.255
ix	Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255

x	Cumulative kVARh – Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
xi	Cumulative kVARh – Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
xii	Cumulative kVAh (Import).	1.0.9.8.0.255	1.0.9.8.0.255
xiii	Average Power Factor (Import).	1.0.13.0.0.255	1.0.13.0.0.255
xiv	Bill MD in Kva with date and time (Import).	1.0.9.6.0.255	1.0.9.6.0.255
xv	Bill MD in Kw with date and time(Import).	1.0.1.6.0.255	1.0.1.6.0.255

Note : If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.

OBIS CODES -IMPORT MODE			
Billing Register		DLMS	BEST proposed OBIS Code
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255	1.0.94.91.6.255
viii	ToD wise MD in kW with date & time ToD1 (Import).	1.0.1.6.1.255	1.0.1.6.1.255
	ToD2 (Import).	1.0.1.6.2.255	1.0.1.6.2.255
	ToD3 (Import).	1.0.1.6.3.255	1.0.1.6.3.255
	ToD4 (Import).	1.0.1.6.4.255	1.0.1.6.4.255
	ToD5 (Import).	1.0.1.6.5.255	1.0.1.6.5.255
ix	Cumulative kWh (Import).	1.0.1.8.0.255	1.0.1.8.0.255
x	Cumulative kVARh – Lag (Import).	1.0.5.8.0.255	1.0.5.8.0.255
xi	Cumulative kVARh – Lead (Import).	1.0.8.8.0.255	1.0.8.8.0.255
xii	Cumulative kVAh (Import).	1.0.9.8.0.255	1.0.9.8.0.255
xiii	Average Power Factor (Import).	1.0.13.0.0.255	1.0.13.0.0.255
xiv	Bill MD in Kva with date and time (Import).	1.0.9.6.0.255	1.0.9.6.0.255
xv	Bill MD in Kw with date and time(Import).	1.0.1.6.0.255	1.0.1.6.0.255
Note			

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
1	Instantaneous 3ph kW load. (Export).	1.0.2.7.0.255	1.0.2.7.0.255
2	Instantaneous 3ph kVAr load with lag lead indication (Export).	1.0.4.7.0.255	1.0.4.7.0.255
3	Instantaneous 3ph KVA load (Export).	1.0.10.7.0.255	1.0.10.7.0.255
4	Current Cumulative kWh (Export).	1.0.2.8.0.255	1.0.2.8.0.255
5	Current kWh ToD 1 (Export).	Not Specified	1.0.2.8.1.255
6	Current kWh ToD 2 (Export).	Not Specified	1.0.2.8.2.255

7	Current kWh ToD 3 (Export).	Not Specified	1.0.2.8.3.255
8	Current kWh ToD 4 (Export).	Not Specified	1.0.2.8.4.255
9	Current kWh ToD 5 (Export).	Not Specified	1.0.2.8.5.255
10	Current Cumulative kVARh Lag (Export).	1.0.7.8.0.255	1.0.7.8.0.255
13	Current kvarh Lag TOD1 (Export).	Not Specified	1.0.7.8.1.255
14	Current kvarh Lag TOD2 (Export).	Not Specified	1.0.7.8.2.255
15	Current kvarh – Lag TOD3 (Export).	Not Specified	1.0.7.8.3.255
16	Current kvarh – Lag TOD4 (Export).	Not Specified	1.0.7.8.4.255
17	Current kvarh – Lag TOD5 (Export).	Not Specified	1.0.7.8.5.255
18	Current Cumulative kvarh – Lead (Export).	1.0.6.8.0.255	1.0.6.8.0.255
19	Current kvarh – Lead TOD1 (Export).	Not Specified	1.0.6.8.1.255
20	Current kvarh – Lead TOD2 (Export).	Not Specified	1.0.6.8.2.255
21	Current kvarh – Lead TOD3 (Export).	Not Specified	1.0.6.8.3.255
22	Current kvarh – Lead TOD4 (Export).	Not Specified	1.0.6.8.4.255
23	Current kvarh – Lead TOD5 (Export).	Not Specified	1.0.6.8.5.255
24	Current Cumulative kVAh (Export).	1.0.10.8.0.255	1.0.10.8.0.255
25	Current kVAh.TOD1 (Export).	Not Specified	1.0.10.8.1.255
26	Current kVAh.TOD2 (Export).	Not Specified	1.0.10.8.2.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
	Instantaneous Profile Parameters		
		DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
	Instantaneous Profile Parameters		
		DLMS OBIS	BEST OBIS
	Instantaneous Profile	1.0.94.91.0.255	1.0.94.91.0.255
	Instantaneous Scaler	1.0.94.91.3.255	1.0.94.91.3.255
27	Current kVAh.TOD3 (Export).	Not Specified	1.0.10.8.3.255
28	Current kVAh.TOD4 (Export).	Not Specified	1.0.10.8.4.255
29	Current kVAh.TOD5 (Export).	Not Specified	1.0.10.8.5.255
30	Current MD in KVA with date & time (Export).	Not Specified	1.0.10.6.0.255
31	Current MD in kVA with date & time TOD 1(Export).	Not Specified	1.0.10.6.1.255
32	Current MD in kVA with date & time TOD 2(Export).	Not Specified	1.0.10.6.2.255
33	Current MD in kVA with date & time TOD 3 (Export).	Not Specified	1.0.10.6.3.255
34	Current MD in KVA with date & timeTOD4(Export).	Not Specified	1.0.10.6.4.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
	Billing Profile Parameters		
		DLMS OBIS	BEST OBIS
	Billing Profile	1.0.98.1.0.255	1.0.98.1.0.255
	Billing Scaler	1.0.94.91.6.255	1.0.94.91.6.255
1	Bill Cumulative kWh (Export).	1.0.2.8.0.255	1.0.2.8.0.255
2	Bill kWh ToD1 (Export).	1.0.2.8.1.255	1.0.2.8.1.255
3	Bill kWh ToD2 (Export).	1.0.2.8.2.255	1.0.2.8.2.255
4	Bill kWh ToD3 (Export).	1.0.2.8.3.255	1.0.2.8.3.255
5	Bill kWh ToD4 (Export).	1.0.2.8.4.255	1.0.2.8.4.255
6	Bill kWh ToD5 (Export).	1.0.2.8.5.255	1.0.2.8.5.255
7	Bill Cumulative kVARh–Lag (Export).	1.0.7.8.0.255	1.0.7.8.0.255
8	Bill kVARh–Lag.TOD1 (Export).	Not Specified	1.0.7.8.1.255
9	Bill kVARh–Lag.TOD2 (Export).	Not Specified	1.0.7.8.2.255
10	Bill kVARh–Lag.TOD3 (Export).	Not Specified	1.0.7.8.3.255
11	Bill kVARh–Lag.TOD4 (Export).	Not Specified	1.0.7.8.4.255
12	Bill kVARh–Lag.TOD5 (Export).	Not Specified	1.0.7.8.5.255
13	Bill Cumulative kVARh–Lead (Export).	1.0.6.8.0.255	1.0.6.8.0.255
14	Bill kVARh–Lead.TOD1 (Export).	Not Specified	1.0.6.8.1.255
15	Bill kVARh–Lead.TOD2 (Export).	Not Specified	1.0.6.8.2.255
16	Bill kVARh–Lead.TOD3 (Export).	Not Specified	1.0.6.8.3.255
17	Bill kVARh–Lead.TOD4 (Export).	Not Specified	1.0.6.8.4.255
18	Bill kVARh–Lead.TOD5 (Export).	Not Specified	1.0.6.8.5.255
19	Bill Cumulative kVAh (Export).	1.0.10.8.0.255	1.0.10.8.0.255
20	Bill kVAh TOD1 (Export).	1.0.10.8.1.255	1.0.10.8.1.255
21	Bill kVAh TOD2 (Export).	1.0.10.8.2.255	1.0.10.8.2.255
22	Bill kVAh TOD3 (Export).	1.0.10.8.3.255	1.0.10.8.3.255
23	Bill kVAh TOD4 (Export).	1.0.10.8.4.255	1.0.10.8.4.255
24	Bill kVAh TOD5 (Export).	1.0.10.8.5.255	1.0.10.8.5.255
25	Bill MD in KVA with date & time (Export).	1.0.10.6.0.255	1.0.10.6.0.255
26	Bill MD in kVA with date & time ToD1 (Export).	1.0.10.6.1.255	1.0.10.6.1.255

27	Bill MD in kVA with date & time ToD2 (Export).	1.0.10.6.2.255	1.0.10.6.2.255
28	Bill MD in kVA with date & time ToD3 (Export).	1.0.10.6.3.255	1.0.10.6.3.255
29	Bill MD in kVA with date & time ToD4 (Export).	1.0.10.6.4.255	1.0.10.6.4.255
30	Bill MD in kVA with date & time ToD5 (Export).	1.0.10.6.5.255	1.0.10.6.5.255
31	Bill Power Factor (Export).	1.0.13.0.0.255	1.0.13.0.0.255

OBIS CODES OF PARAMETERS REQUIRED IN EXPORT MODE			
Billing Register		DLMS	BEST proposed
Technical requirements		Profile1.0.98.1.0.255	1.0.98.1.0.255
		Scaler1.0.94.91.6.255.	1.0.94.91.6.255
i	Month	0.0.0.1.2.255	0.0.0.1.2.255
ii	ToD wise Cumulative kWh ToD1 (Export).	1.0.2.8.1.255	1.0.2.8.1.255
	ToD2 (Export).	1.0.2.8.2.255	1.0.2.8.2.255
	ToD3 (Export).	1.0.2.8.3.255	1.0.2.8.3.255
	ToD4 (Export).	1.0.2.8.4.255	1.0.2.8.4.255
	ToD5 (Export).	1.0.2.8.5.255	1.0.2.8.5.255
iii	ToD wise Cumulative kVARh Lag ToD1 (Export).	Not Specified	1.0.7.8.1.255
	ToD2 (Export).	Not Specified	1.0.7.8.2.255
	ToD3 (Export).	Not Specified	1.0.7.8.3.255
	ToD4 (Export).	Not Specified	1.0.7.8.4.255
	ToD5 (Export).	Not Specified	1.0.7.8.5.255
iv	ToD wise Cumulative kVARh Lead ToD1 (Export).	Not Specified	1.0.6.8.1.255
	ToD2 (Export).	Not Specified	1.0.6.8.2.255
	ToD3 (Export).	Not Specified	1.0.6.8.3.255
	ToD4 (Export).	Not Specified	1.0.6.8.4.255
	ToD5 (Export).	Not Specified	1.0.6.8.5.255
v	ToD wise Cumulative kVAh ToD1 (Export).	1.0.10.8.1.255	1.0.10.8.1.255
	ToD2 (Export).	1.0.10.8.2.255	1.0.10.8.2.255
	ToD3 (Export).	1.0.10.8.3.255	1.0.10.8.3.255
	ToD4 (Export).	1.0.10.8.4.255	1.0.10.8.4.255
	ToD5 (Export).	1.0.9.8.5.255	1.0.9.8.5.255
vi	ToD wise Power factor ToD1 (Export).	Not Specified	1.0.13.0.1.255
	ToD2 (Export).		1.0.13.0.2.255
	ToD3 (Export).		1.0.13.0.3.255
	ToD4 (Export).		1.0.13.0.4.255

	ToD5 (Export).		1.0.13.0.5.255
vii	ToD wise MD in kVA with date & time ToD1 (Export).	1.0.10.6.1.255	1.0.10.6.1.255
	ToD2 (Export).	1.0.10.6.2.255	1.0.10.6.2.255
	ToD3 (Export).	1.0.10.6.3.255	1.0.10.6.3.255
	ToD4 (Export).	1.0.10.6.4.255	1.0.10.6.4.255
	ToD5 (Export).	1.0.10.6.5.255	1.0.10.6.5.255
viii	ToD wise MD in kW with date & time ToD1 (Export).	1.0.2.6.1.255	1.0.2.6.1.255
	ToD2 (Export).	1.0.2.6.2.255	1.0.2.6.2.255
	ToD3 (Export).	1.0.2.6.3.255	1.0.2.6.3.255
	ToD4 (Export).	1.0.2.6.4.255	1.0.2.6.4.255
	ToD5 (Export).	1.0.2.6.5.255	1.0.2.6.5.255
ix	Cumulative kWh (Export).	1.0.2.8.0.255	1.0.2.8.0.255
x	Cumulative kVARh – Lag (Export).	1.0.7.8.0.255	1.0.7.8.0.255
xi	Cumulative kVARh – Lead (Export).	1.0.6.8.0.255	1.0.6.8.0.255
xii	Cumulative kVAh (Export).	1.0.10.8.0.255	1.0.10.8.0.255
xiii	Average Power Factor (Export).	1.0.13.0.0.255	1.0.13.0.0.255
xiv	Bill MD in Kva with date and time (Export).	1.0.10.6.0.255	1.0.10.6.0.255
xv	Bill MD in Kw with date and time (Export).	1.0.2.6.0.255	1.0.2.6.0.255

Note : If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.

OBIS Codes				
Technical requirements			DLMS	BEST proposed OBIS Code
i	Low/High Voltage- a)Voltage failure, b) Voltage Unbalance, c) Overvoltage d) Under voltage.	Voltage Tamper Profile	0.0.99.98.0.255	0.0.99.98.0.255
		Voltage Tamper Summary Profile	0.0.21.0.5.255	0.0.21.0.5.255
ii	Current Reversal.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
		Current Tamper Summary Profile	0.0.21.0.6.255	0.0.21.0.6.255
iii	Meter Cover Open.	0.0.99.98.5.255	Event ID 251	Event ID 251
iv	Magnetic Defraud Energy.		Not specified	1.0.1.8.0.255
	Magnetic Tamper Event with Date Time	Tamper Event	Event ID201,202	0.0.96.11.4.255

v	Low Current- a) Current Bypass, b) Current Open, c) Over Current.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
vi	Current Unbalance.	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
		Current Tamper Summary Profile	0.0.21.0.6.255	0.0.21.0.6.255
vii	Low Power Factor	Low Power Factor	Event ID 205,206-Low Power Factor.	Event ID 205,206-Low Power Factor.
vii i	Additional points.	Cumulative Tamper Count	0.0.94.91.0.255	0.0.94.91.0.255
		No. of Power failure	0.b.99.98.2.255	0.0.96.7.0.255
		Cumulative Duration of Power failure		0.0.94.91.8.255
		Power ON Duration in minutes (bill to bill)		0.0.94.91.13.255

OBIS Codes			
Technical requirements		**DLMS**	**BEST proposed OBIS Code**
Events Profile			
Events.	Voltage Tamper Profile	0.0.99.98.0.255	0.0.99.98.0.255
	Current Tamper Profile	0.0.99.98.1.255	0.0.99.98.1.255
	Power Related Tampers	0.0.99.98.2.255	0.0.99.98.2.255
	Transaction Tamper Profile	0.0.99.98.3.255	0.0.99.98.3.255
	Other Tamper Profiles	0.0.99.98.4.255	0.0.99.98.4.255
	Non Rollover Tamper Profiles	0.0.99.98.5.255	0.0.99.98.5.255
Capture Parameters for Events of Scaler Profile			
Parameters.	Date and Time of event	0.0.1.0.0.255	0.0.1.0.0.255
	Event Code	0.0.96.11.e.255	0.0.96.11.e.255
	Current, IR	1.0.31.7.0.255	1.0.31.7.0.255
	Current, IY	1.0.51.7.0.255	1.0.51.7.0.255
	Current, IB	1.0.71.7.0.255	1.0.71.7.0.255
	Voltage, VRN	1.0.32.7.0.255	1.0.32.7.0.255

OBIS Codes			
Technical requirements		**DLMS**	**BEST proposed OBIS Code**
	Voltage, VYN	1.0.52.7.0.255	1.0.52.7.0.255
	Voltage, VBN	1.0.72.7.0.255	1.0.72.7.0.255
	Signed power factor, R-Phase	1.0.33.7.0.255	1.0.33.7.0.255
	Signed power factor, Y-Phase	1.0.53.7.0.255	1.0.53.7.0.255
	Signed power factor, B-Phase	1.0.73.7.0.255	1.0.73.7.0.255

	Cumulative Energy kWh	1.0.1.8.0.255	1.0.1.8.0.255
	Cumulative Energy kVAh	1.0.9.8.0.255	1.0.9.8.0.255
Tamper Summary Profile.		Additional Readout profile in IEC62056-62	
1	Voltage Tamper Summary Profile.	0.0.21.0.5.255	0.0.21.0.5.255
2	Current Tamper Summary Profile.	0.0.21.0.6.255	0.0.21.0.6.255
3	Other Tamper Summary Profile.	0.0.21.0.7.255	0.0.21.0.7.255
4	Non Rollover Tamper Summary Profile.	0.0.21.0.8.255	0.0.21.0.8.255

OBIS Codes			
Technical requirements		DLMS	BEST proposed OBIS Code
Parameters.			
1	Tamper Event ID.	0.0.96.11.e.255	0.0.96.11.e.255
2	Cumulative Tamper Count.	0.0.94.91.0.255	0.0.94.91.0.255
3	Cumulative Tamper Duration.	Not Specified	Not Specified
4	Date & Time of First Occurrence.	1.0.0.9.0.255	1.0.0.9.0.255
5	Date & Time of First restore.	1.0.0.9.1.255	1.0.0.9.1.255
6	Date & Time of Latest Occurrence.	1.0.0.9.2.255	1.0.0.9.2.255
7	Date & Time of Latest Restoration.	1.0.0.9.3.255	1.0.0.9.3.255
ESD.		Event ID 37	Event ID 37
Clause No, Self Diagnostic Features.	i)RTC Status-BIT 0 (0x01) ii)NVM Status- BIT 1(0x02) iii)RTC Battery- BIT 2(0x04)	Not Specified	1.0.96.5.0.255
General Purpose Parameters:-Profile Code: 0.0.94.91.10.255.			
1	Meter Serial Number.	0.0.96.1.0.255	0.0.96.1.0.255
2	Manufacture Name.	0.0.96.1.1.255	0.0.96.1.1.255
3	Firmware version for meter.	1.0.0.2.0.255	1.0.0.2.0.255
4	Meter Type.	0.0.94.91.9.255	0.0.94.91.9.255
5	Meter year of manufacture.	0.0.96.1.4.255	0.0.96.1.4.255
6	Category.	0.0.94.91.11.255	0.0.94.91.11.255
7	Current Rating.	0.0.94.91.12.255	0.0.94.91.12.255
8	Voltage Rating	1.0.0.6.0.255	1.0.0.6.0.255
9	Accuracy Class	Not Specified	1.0.96.141.0.255
10	Meter Constant	1.0.0.3.0.255	1.0.0.3.0.255
11	Internal CT Ratio.	1.0.0.4.2.255	1.0.0.4.2.255
12	Internal PT Ratio.	1.0.0.4.3.255	1.0.0.4.3.255
Programmable Parameters			
1	Real Time Clock-Date and Time.	0.0.1.0.0.255	0.0.1.0.0.255
2	Demand Integration Period.	1.0.0.8.0.255	1.0.0.8.0.255
3	Profile Capture Period.	1.0.0.8.4.255	1.0.0.8.4.255
4	Single-action Schedule for Billing Dates.	0.0.15.0.0.255	0.0.15.0.0.255

5	Activity Calendar for Time Zones.	0.0.13.0.0.255	0.0.13.0.0.255

OBIS Codes			
Technical requirements		DLMS	BEST proposed OBIS Code
6	Image Transfer	0.0.44.0.0.255	0.0.44.0.0.255
7	Metering Mode	0.0.94.96.19.255	0.0.94.96.19.255
8	Current Association MR (LLS secret change)	0.0.40.0.2.255	0.0.40.0.2.255
9	Current Association US (HLS Key change)	0.0.40.0.3.255	0.0.40.0.3.255
10	Current Association FW (HLS Key change)	0.0.40.0.5.255	0.0.40.0.5.255
11	Global Key (encryption and authentication)	0.0.43.0.e.255(e=2,3 ,4,5)	0.0.43.0.e.255 (e=2,3,4,5)
12	Image Activation Single Action Shedule	0.0.15.0.2.255	0.0.15.0.2.255
13	Event Status Word Filter	0.0.94.91.26.255	0.0.94.91.26.255
Note	If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.		

OBIS Codes			
Clause No , Load Survey		DLMS (Load Profile OBIS Codes)	BEST proposed OBIS Code
Technical requirements		Profile 1.0.99.1.0.255	1.0.99.1.0.255
		Scaler 1.0.94.91.4.255	1.0.94.91.4.255
1	Voltage of each phase	VRN 1.0.32.27.0.255	VRN 1.0.32.27.0.255
		VYN1.0.52.27.0.255	VYN 1.0.52.27.0.255
		VBN 1.0.72.27.0.255	VBN 1.0.72.27.0.255
2	Current of each phase	IR 1.0.31.27.0.255	IR 1.0.31.27.0.255
		IY 1.0.51.27.0.255	IY 1.0.51.27.0.255
		IB 1.0.71.27.0.255	IB 1.0.71.27.0.255
3	Kwh	1.0.1.29.0.255	1.0.1.29.0.255
4	kVAh	1.0.9.29.0.255	1.0.9.29.0.255
5	Kw	Not Specified	Need not specify. Derived parameter in BCS.
6	Kva	Not Specified	
7	PF	Not Specified	
8	kVarh(lag)	Not Specified	1.0.5.29.0.255
9	kVarh(lead)	Not Specified	1.0.8.29.0.255
10	Real Time Clock Date and Time	0.0.1.0.0.255	0.0.1.0.0.255

Technical Specification for Availability Based Tariff (ABT) Meter**ANNEXURE D1: AC POLY PHASE -/1A,-/5A, (-/110)V CTPTO ABT METER**

WITH DLMS PROTOCOL AND ETHERNET PORT

I. INTRODUCTION

BEST Undertaking (BEST) distributes electricity in the island city of Mumbai. Its area of distribution lies from South Mumbai to Sion in the East and to Mahim in the West. BEST undertaking distributes power to an area spread over about 69 sq.km and provides power supply to more than 10 Lakh consumers connected to its distribution network, comprising residential, commercial and industrial consumers depending on the purpose of use of electricity. The organization is also providing public transport service in Mumbai city, Suburbs and its nearby regions. BEST receive the electricity from M/s TATA at 116 Interface points at 63 different locations called as RSS.

II. BACKGROUND

Availability Based Tariff and Deviation Settlement Mechanism will be implemented in BEST Undertaking from 1st April 2020 considering the settlement period as 5-min. Presently there are 116 Availability Based Tariff (ABT) Meters are to be installed at various interface points situated in RSS of BEST Undertaking and implement the Automated Meter Reading and Meter Data Processing System. The above is also in line with the recommendations of the Report on Scheduling, Accounting, Metering and Settlement of Transactions in Electricity (SAMAST) that was endorsed by the Forum of Regulators on 15th July 2016.

III. TECHNICAL SPECIFICATION

1. Scope

The project envisages to install Availability Based Tariff (ABT) Meters (5 min block interval Interface meters). The project also envisages putting in place a system of Remote Meter Data Reading (RMR) / Meter Data Processing (MDP) software along with the associated hardware for meter data collection, validation and processing before forwarding the meter data for energy accounting. The MDP may be part of MDM or standalone, capable of integrating with main MDM. The successful bidder shall be responsible for supply of ABT Meters.

The technical specifications cover the design, manufacturing, testing, supply and delivery of AC 3 ph., 4 wires Availability Based Tariff (ABT) Meter. The meter shall incorporate suitable communication features to communicate with DCU (Data Concentrator Unit) installed at the RSS. The DCU shall communicate with Cloud based Server for data transfer to BEST, as per the user defined schedule.

The Bill of Quantities shall be developed separately.

The execution of the project shall be planned in such a manner to cover all interface points zone wise for energy accounting system. The ABT Meters shall record data at 5 minute interval. This data shall be collected and archived at Power Management Department of BEST Undertaking. However the settlement period for data processing and energy accounting shall be defined by the user as per the STU regulations. For instance, if the STU chooses the settlement period to be 15 min, then the archived data shall be of 15 min interval so as to be compatible with the existing software for meter data processing and energy accounting at SLDC. The format of the 15-min processed data reports shall be exactly same as that of the existing 15-min processed data reports in text files for compatibility at SLDC end.

The energy metering system specified herein shall be used for tariff metering for bulk, inter-Utility/AMI- IA power flows, in different States of India. Projection mounted type, Static composite meter shall be installed at interface points as a self-contained device for measurement of Voltage (V), Frequency (f), Active (Wh) and Reactive (VArh) energy exchanged in each successive 5/15 min time block.

The meters shall be suitable for communication with external device like DCU, which will communicate with Cloud Server for remote data transfer. The meter shall compulsorily have one optical port for taking reading through Laptop and one Ethernet port for transferring the data to DCU.

2. Applicable Standards

The meter shall conform to IS:14697-1999 with latest amendments, CBIP Publication No. 325 and CEA Regulation 2006 with latest amendments and IS 15959 Part-1,IS 15959 Part-3 with latest amendments.

The meters shall fully comply with all stipulations in IS 14697 except those specifically modified by this specification.

3. Rating

Voltage rating - Rated Voltage shall be 3-phase, 4 wire, 110 Volts (LL) and 63.5 Volts (LN). The operating voltage range shall be +20% to -30% of the rated voltage.

Current rating**-** Current rating shall be configurable as per requirement.

Basic Current (Ib) - 1 Amp. Maximum Current (Imax) - 1.2 Amp.

Basic Current (Ib) – 5 Amp. Maximum Current (Imax) - 6 Amp.

Frequency- The reference frequency shall be 50Hz.

4. Electrical Requirements

Auxiliary Supply to ABT Meter- The meters shall normally operate with the power drawn from AC/DC auxiliary power supply (110VAC/110VDC) to reduce the Voltage Transformer (VT) burden. In addition, there shall be provision to operate the meter from the Voltage Transformer (VT) secondary circuit having a rated secondary line-to- line voltage of 110V, and current transformers (CTs) having a rated secondary current of 1 A or 5A. Any further transformers/ transactions/ transducers required for their functioning shall be in-built in the meters. Necessary isolation and/or suppression shall also be built-in, for protecting the meters from surges and voltage spikes that occur in the VT and CT circuits of extra high voltage switchgears.

Also, the meter shall have suitable of ±15% tolerance for DC supply.

The meters shall safely withstand the usual fluctuations arising during faults etc. In particular, VT secondary voltages 115% of Vref applied continuously and 190% of Vref for 3.0 seconds, and CT secondary current 150% of Iref applied continuously and 30 times of Iref applied for 0.5 seconds shall not cause any damage to or mal operation of the meters.

The meters shall continue to function for the remaining healthy phase(s), in case one or two phases of VT supply fails. In case of a complete VT supply failure, the computation of average frequency shall be done only for the period during which the VT supply was available in the 5-minute block. Any time block contraction or elongation for clock correction shall also be duly accounted for.

The active and apparent power consumption in each voltage circuit including power supply of meter shall be as per Clause No. 9.1.1 of IS: 14697:1999 with latest amendments.

The apparent power taken by current circuit shall be as per Clause No. 9.1.2 of IS: 14697:1999 with latest amendments.

The meter shall be compliant to the various Influence Quantities as per Clause No. 9.2 to 9.4 of IS:14697:1999 with latest amendments.

5. Climatic Conditions

The standard reference temperature for performance shall be 45°C and relative humidity in monsoon shall be 95%. Climate: Hot, humid and dusty.

6. Electromagnetic Compatibility (EMC) and Electromagnetic Interference (EMI) and harmonics

The meter shall comply with EMC and EMI as per IS: 14697:1999/CBIP Publication No. 325 (clause no 5.5) with latest amendments. The necessary test certificates shall be submitted.

The meter shall comply with harmonic test requirements as per clause no. 11.2 Table 13 Influence Quantities of IS 14697:1999 with latest amendment) /clause no. 4.6.5/4.6.3.4 of CBIP Publication No 325.The necessary test certificates shall be submitted.

7. Accuracy Requirement

Accuracy Class of Meter shall be 0.2S. The accuracy shall not drift with time.

Limits of variation in percentage error due to variation of current shall be as per Clause No. 11.1 of IS: 14697:1999 with latest amendments.

Limits of variation in percentage error due to change of influence quantities shall be as per Clause No. 11.2 of IS: 14697:1999 with latest amendments.

Starting Current shall be 0.1% of Ib.

Meter shall be compliant with test of No load condition as per Clause no. 12.12 of IS.

The meter shall be fully functional within 5 seconds after the rated voltage is applied to the meter terminals.

8. Exception Management

The three line-to-neutral voltage shall be continuously monitored and in case any of these falls below defined threshold (70% of Vref), meter shall have suitable indication on LED/ LCD.

The meter shall also have provision for low voltage event logging in meter memory in case of any phase voltage going below a defined threshold. The time blocks in which such a voltage failure occurs/persists shall also be recorded in the meter's memory with a symbol "*".

If 3 Phase RMS voltage applied to the ABT Meter is in between 5% to 70% of Vref and if Voltage is less than 5% of Vref, meter should record Zero voltage symbol "**Z**".

There shall also be a provision to generate error log in case of VT supply failure

9. Time Accuracy

Each meter shall have a built-in calendar and clock, having an accuracy of 10 seconds per month or better.

The calendar and clock shall be correctly set at the manufacturer's works.

The date (year-month-day) and time (hour-min.-sec.) shall be displayed on the meter front on demand.

Meter shall have the intelligence to synchronize the time with GPS (Local GPS/Remote GPS) signal and remotely from PC using web based software.

Limited time synchronization through meter communication port shall be possible at site. When an advance or retard command is given, twelve subsequent time blocks shall be contracted or elongated by five seconds each.

Time advance and retard command should be limited to one command/week.

All clock corrections shall be registered in the meter's memory and suitably shown on print out of collected data.

10. Standard raw data format

The whole system shall be such as to provide a print out (both from the local PC, and from remote central computer) of the following format:

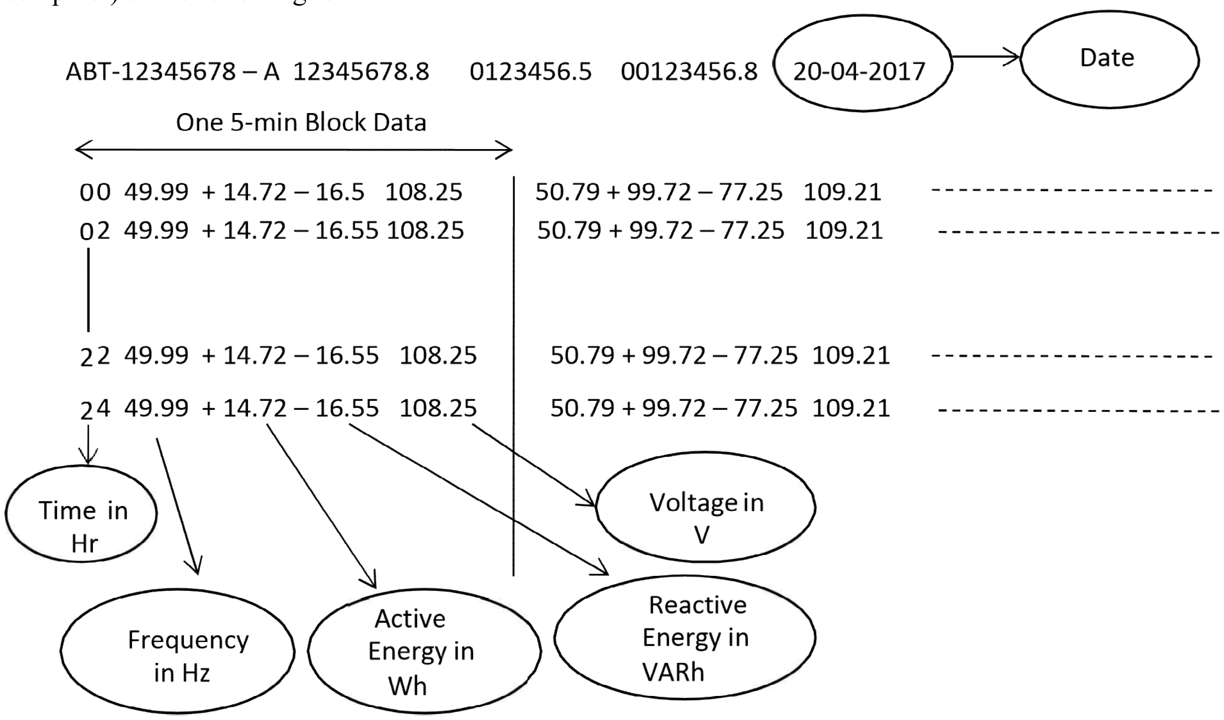


Figure 1 – Standard raw data format for ABT Meter

There are 4 values in one 5 min time block. The first row shall contain the meter data for 2 hours, i.e. 24 time blocks, 00 hrs to 02:00 hrs. Similarly the 2nd row shall contain the data for the next 2 hours and henceforth.

The above data shall be available in text file format (file extension as per IEEE standard/.txt) exportable to Excel. Indication of time retard or advance to be provided without disturbing the proposed format. Each 5-min block data consists of Frequency (in HZ), Active energy (in Wh), Reactive energy (in VARh) and Voltage (in V). All 5 minute Wh and VARh figures in .NPC/output report shall be rounded off upto third decimal. Active and Reactive energy for High and Low voltage condition are to be in the order of 7+1 digits.

11. Measuring Elements.

Current Transformer shall be provided as measuring element in the phase circuit.

Additional CT/Shunt shall be provided in the neutral circuit of meter.

The meter shall have CTs with Magnetic shielding.

The Current Transformers used shall not saturate with passage of DC current as per IS: 14697:1999 with latest amendments.

12. Constructional Requirements.

The meters shall be supplied housed in compact and sturdy, metallic or high grade fire resistant polycarbonate molded cases of non-rusting construction and/or finish.

The supplier shall submit relevant type test certificate as per relevant IS/ISO/IEC for the material used for the meter case.

The cases shall be designed for simple mounting on a plane, vertical surface such as a control/relay panel front.

All terminals for CT and VT connections shall be arranged in a row along the meter's lower side.

The Current, potential Terminal shall be of brass or copper with flat headed brass screws. All components shall be duly plated.

Terminals shall have a suitable construction with barriers and cover, to provide a secure and safe connection of CTs and VTs leads through stranded copper conductors of 4 sq. mm. and 2.5 sq. mm. size respectively.

Connection of internal terminals shall be as per IS: 14697:1999 with latest amendments.

All meters of the same model shall be totally identical in all respects except for their unique identification codes.

They shall also be properly sealed and tamper evident, with no possibility of any adjustment at site, except for transactions allowed in IS 15959.

The meters shall safely withstand, without any damage or mal operation, reasonable mechanical shocks, earthquake forces, ambient temperature variations, relative humidity etc. in accordance with IS-14697.

The meters shall have an IP51 category dust-tight construction but without suction in the meter and shall be capable of satisfactory operation in an indoor, non-air conditioned installation & outdoor installation in a panel.

The Terminal Block shall be made of Polycarbonate or equivalent grade and shall form integral part of the meter base.

The supplier shall submit relevant type test certificate as per relevant IS/ISO/IEC for the material used for the meter terminal block.

The supplier shall submit type test certificate for Resistance to Heat and Fire test as per Clause No. 12.4 of the IS: 14697:1999 with latest amendments.

13. Pulse Output

Each meter shall have a test output device (visual), as per clause 6.11 of IS 14697.1999, for checking the accuracy of active energy (Wh) measurement.

Separate flashing Wh (Watt hour) and VARh (VAR hour) LED indications on the front of the meter shall be provided.

The preferred pulsing rate is twenty (20) per Wh for CT sec-1A and four (4) per Wh for CT sec –5A. However, bidder may decide on their own.

It shall be possible to couple this device to suitable testing equipment also.

14. Internal Battery

An automatic backup for continued operation of the meter's calendar clock, and for retaining all data stored in its memory, shall be provided through a long- life non rechargeable batteries, which shall be capable of supplying the required power for at least 10 years.

The meters shall be supplied duly fitted with the batteries, which shall not require to be changed for at least 10 years, as long as total VT supply interruption does not exceed two years.

The battery mounting shall be designed to facilitate easy battery replacement without affecting PCB of the meter.

Battery for RTC and battery for backup shall be separate.

15. Marking of Meters.

The meter shall have clearly visible and indelible nameplate in accordance with the Clause No. 7.1 of IS: 14697:1999 with latest amendment.

"BEST UNDERTAKING PROPERTY" shall be marked on the nameplate of the meter.

Terminal markings shall have sequence as per Standard Connection Diagram shown in IS: 14697:1999 / CBIP Publication No. 325 with latest amendments.

Meter name plate shall have standard bar code containing information of meter number given by BEST.

Bar coded information of Meter Number shall be printed on the meter name plate and it shall be easily readable by universal bar code scanner.

The connection diagram shall be marked on Terminal Block cover.

The offered meter shall be with ISI mark. Tenderer shall furnish valid BIS certification along with the offer.

16. Meter Number

Meter number will be provided to successful tenderer after placing Purchase Order.

16.2. Meter serial number provided by BEST and Maker number of the meter shall match with each other so that meter ID shall be treated as meter number in Base Computer System (BCS).

17. Sealing Arrangement

The sealing points shall be as per CEA Regulations 2006 with latest amendments.

The supplier shall fix tamper evident, Bar Coded Holographic Seal on the left hand side of the meter. It shall not be possible to remove the seal intact.

18. Self-diagnostic Features

The meter should be capable of performing complete self-diagnostic check to monitor integrity of data in memory location at all time.

The meter shall have indication of unsatisfactory/non-functioning/malfunction of the followings on the display as well in BCS:

a. Real Time Clock (RTC) status.
b. RTC Battery status.
c. Non-volatile Memory (NVM) status.

19. Measurement

The active energy (Wh) measurement shall be carried out on 3-phase, 4-wire principle, with an accuracy as per class **0.2S** (IS 14697).

The meter shall compute the net active energy (Wh) sent out from the substation bus bars during each successive 5 min block, and store it in its memory up to fourth decimal with plus sign if there is net Wh import and with a minus sign if there is net Wh export. Further Wh data in .NPC/output report shall be rounded up to third decimal.

The meter shall count the number of cycles in VT output during each successive 5 min block, and divide the same by 300 (60 sec/min x 5min) to arrive at the average frequency. The least count of the frequency data shall be 0.001 Hz. The frequency data shall be stored in the meter's memory in Hertz up to third decimal. Further Wh data in .NPC/output report shall be rounded upto second decimal.

The meter shall continuously compute the average of the RMS values of the three line- to-neutral VT secondary voltages as a percentage of 63.51 V, and display the same on demand. The accuracy of the voltage measurement/computation shall be at least 0.5%, a better accuracy such as 0.2% in the 95% -105% range being desirable. The voltage data shall be stored in the meter's memory in volts up to third decimal. Further Wh data in .NPC/output report shall be rounded up to second decimal.

The Reactive energy (VARh) measurement shall be carried out on 3-phase, 4- wire principle, with an accuracy of 0.2S as specified in IS 14697.

The meter shall compute the net Reactive energy (Net VARh=(VARh Import - VARh Export)) received at RSS bus bars during each successive 5 min block, and store it in its memory up to fourth decimal with plus sign if there is net VARh import and with a minus sign if there is net VARh export.

It shall also display on demand the net VARh received during the previous 5 min block. Further Wh data in .NPC/output report shall be rounded up to third decimal.

The meter shall also integrate the reactive energy (VARh) algebraically into two separate registers, one for the period for which the average RMS voltage is above 103.0%, and the other for the period for which the average RMS voltage is below 97.0%.

The current reactive power (VAR), with a minus sign if negative, and cumulative reactive energy (VARh) readings of the two registers (>103% and <97%) shall be displayed on demand.

The readings of the two registers at each midnight shall also be stored in the meter's memory.

When reactive power is being received at RSS bus bars, VAR display shall have a plus sign or no sign and VARh registers shall move forward. When reactive power flow is in the reverse direction, VAR display shall have negative sign and VARh registers shall move backwards.

Meter shall continuously integrate and display on demand the net cumulative active energy received at RSS bus bars up to that time. The cumulative net Wh reading at each midnight shall be stored in the meter's memory. The register shall move backwards when active power flows back to substation bus bars.

Errors for different power factors shall be as defined in IS14697.

For reactive power (VAR) and reactive energy (VARh) measurements, IS14697 shall be complied with. The accuracy of measurement of reactive energy shall be as per class 0.2S.

The meter shall be capable of measuring fundamental energy as well as total energy i.e. fundamental plus Harmonics energy. The total energy & fundamental energy shall be stored in separate registers of the meter memory and shall be capable of downloading through Laptop and remotely through HES. Data security shall be ensured as per IS 15959 (three layers of security).

20. Memory/ Storage

Each meter shall have a non-volatile memory in which the following shall be automatically stored.

Average frequency for each successive 5 min block, in Hertz up to third decimals.

Net Wh transmittal during each successive 5 min block, up to fourth decimal, with plus sign if there is net Wh import and with a minus sign if there is net Wh export.

Net VARh transmittal during each successive 5 min block, up to fourth decimal, with plus sign if there is net VARh import and with a minus sign if there is net VARh export.

Cumulative Wh transmittal at each midnight, in eight digits including one decimal.

Cumulative VARh transmittal for voltage high condition, at each midnight in eight digits including one decimal.

Cumulative VARh transmittal for voltage low condition, at each midnight, in eight digits including one decimal.

Average RMS voltage for each successive 5min block.

Date and time blocks of failure of VT supply on any phase, as a star (*)/ (Z) mark as defined above.

The meters shall store all the above listed data in their memories for a period of minimum thirty five (35) days.

21. Energy Registers

All import & export energies and respective cumulative energies shall be stored in separate tariff registers.

Leading and Lagging reactive energies shall be stored in separate registers.

VAh shall be derived from lag and lead reactive components. Energy Meter shall not register less VAh units than Wh units in any case. At UPF, VAh shall be equal to Wh.

22. Billing Registers.

The meter shall store cumulative value of Wh, VAh, VARh (lag) and VARh (lead) energies in Import as well as export mode.

Billing parameters shall be generated at the end of each billing cycle and stored in memory.

Last twelve (12) months billing history shall be available in memory of meter in FIFO basis and shall be viewed on BCS after data downloading.

23. Demand Registers

The meter shall register 5/15 Min Demand/Maximum Demand in VA/W based on derived VAh/Wh accurately for power factor range of Zero Lag-Unity–Zero Lead.

All import & export demands and respective cumulative demands shall be stored in separate tariff registers with date and time stamping, since last reset.

23.3. The option of selection of MD in VA or W shall be available. Default MD shall be in VA.

23.4 VA MD calculation shall be based on lag and lead components of VAR.

Integration period for maximum demand calculation shall be 5/15 minutes. The MD shall be block window type such as 00.00 to 00.05/00.00 to 00.15 etc.

Default MD resetting shall be automatic on 1st of every month at 00.00 hours. Manual MD resetting shall be disabled.

MD shall be displayed in 4 digit integer and 4 digit decimal. Cumulative MD shall be displayed in 5 digit integer and 3 digit decimal.

24. Parameters Required in ABT Meters

Instantaneous Parameters

Instantaneous Parameters and their OBIS codes and interface class/Attribute shall be as per Clause17 Table A14 Category-D4 of IS15959 PART-3

Billing Parameters

Billing Parameters and their OBIS codes and interface class/Attribute shall be as per Clause 20 Table A17 Category-D4 of IS15959 PART-3

Daily energies

The meter shall record the energy snapshots on daily basis at 24:00 Hrs. for 35 days.

Daily load profile parameters and their OBIS codes and interface class/Attribute shall be as per clause 19 Table A 16 Category-D4 of IS15959 PART-3.

Load Survey

The meter shall be provided with load survey of parameters with date and time stamping for a period of at least 35 days.

Block Load profile parameters shall be as per clause 18 Table A15 Category-D4 of IS15959 PART-3 Daily, weekly and monthly report shall be available by giving complete details in 5/15 minutes interval.

It shall be viewed on BCS after data downloading in analytical/tabular as well as graphical format for the daily/weekly/monthly basis.

There shall be facility to export the data in Excel/ASCII/PDF/XML and .NPC format. The load survey data shall be only for "Power ON" days.

Phasor Representation

Meter shall support parameters required to develop phasors of current and voltage at HES.

Additional Parameters

Additional Parameters and OBIS codes required are as follows.

1) Fundamental Energy Wh (1.0.1.8.1.255) (Required in block Load profile)
2) Previous Interval Net VARh Q1 Q4 (Required in block Load profile)
3) Previous Interval Net VARh Q2 Q3 (Required in block Load profile)
4) VARh Q1Q4(Voltage between 97% – 103%) (Required in block Load profile) 5) VARh Q2Q3(Voltage between 97% – 103%) (Required in block Load profile)
6) VARh Q1Q4(Voltage > 103%) (Required in block Load profile)
7) VARh Q2Q3(Voltage > 103%) (Required in block Load profile)
8) VARh Q1Q4(Voltage < 97%) (Required in block Load profile)
9) VARh Q2Q3(Voltage < 97%) (Required in block Load profile)
10) R - Phase Instantaneous W (1.0.21.7.0.255)
11) Y - Phase Instantaneous W (1.0.41.7.0.255)
12) B - Phase Instantaneous W (1.0.61.7.0.255)
13) R - Phase Instantaneous VA
14) Y - Phase Instantaneous VA
15) B - Phase Instantaneous VA
16) R - Phase Instantaneous VAR (1.0.23.7.0.255)
17) Y - Phase Instantaneous VAR (1.0.43.7.0.255)
18) B - Phase Instantaneous VAR (1.0.63.7.0.255)
19) System Error / Warnings
20) Firmware Version

25. Display

The meter shall have high contrast evenly distributed permanent backlit LCD display. The backlit colour shall be Green OR Milky White.

The LCD display shall withstand a temperature of 70°C under normal operating conditions. The supplier shall provide necessary certification/data sheet for the same.

The LCD display shall not be affected by the external electrical and magnetic disturbances.

The display modules shall be well protected from the external Ultra Violet (UV) radiations.

The display visibility shall be sufficient to read the meter mounted at height of 0.5 meter as well as at the height of 2 meters.

Meter shall have 7 segment LCD display. The segment size shall be minimum 9mm x 5mm.

Meter shall display alphanumeric meter serial number.

The display shall be trans reflective STN (STN–Super Twisted Nematic) (160°) type industrial grade with extended temperature range.

Display scrolling time shall be ten (10) seconds.

Minimum 7-digit integers and 1 digit decimal for energy parameters shall be provided.

Meter shall display 7 digit meter number which shall have all numeric numbers.

Display sequence

i) Meter serial no. 1234567

ii) Date (year month day /yyyy mm dd) : 20160311 d iii) Time (hour

min sec /hh mm ss) : 195527 t iv) Cumulative Wh reading : 1234567.8 C

v) Average frequency of the previous block : 49.895 F vi)

Net Wh transmittal during the previous block: - 28.75 E vii)

Net VARh transmittal during the previous block: - 18.75 R

viii) Average % Voltage : 99.2 U ix) Reactive power (VAR) :

106.5 r

x)Voltage - high VARh register reading : 1234567.5 H

xi)Voltage - low VARh register reading : 1234567.4 L

xii)Low battery indication

xiii) The three line-to-neutral voltages shall be continuously monitored and in case any of these falls below 70 %, then preferably, the corresponding flashing LED provided on meter's front shall become steady. They all shall go off if all three voltages fall below 70 %. The LED shall automatically resume flashing when all VT secondary voltages are healthy again.

xiv) The two VARh registers (x and xi) shall remain stay-put while VT supply is unhealthy.

Any other better or more informative mechanism to display the above shall be preferred. The above shall be mutually agreed between the BEST and vendor.

A touch key or push button shall be provided on the meter front for switching on the display and for changing from one indication to the next.

Preferably the display shall switch off automatically about one minute after the last operation of touch key/push button. When the display is switched on, the parameter last displayed shall be displayed again, duly updated.

26. Communication

The Communication Protocol shall be as per IS: 15959-3/DLMS-Indian Standard.

The supplier shall submit certificate from CPRI/ any other Government approved NABL accredited Laboratory for meters conforming to IS:15959/DLMS- Indian Companion Standard.

OBIS codes shall be as per Category-D4 of IS15959 PART-3.

If any additional OBIS/Profile/Scaler code is provided then the tenderers/supplier shall submit the list for the parameters with detailed justification. Based on the detailed justification submitted by tenderers/supplier, BEST reserves right to accept/reject the OBIS/Profile/Scaler code.

Each meter must have an optical port on its front for tapping all data stored in its memory through Laptop.

In addition to the above each meter shall also be provided with a

a) RS-485 port

b) Ethernet port

c) USB/RS-232 port.

All the data stored in the meter's memory shall be transferred to DCU by LAN connectivity and further this data shall be transferred to cloud based server on 4G LTE or 4G with 3G and 2G fallback at scheduled time.

RS 485 and USB ports shall be used for local computer and external storage. The overall intention is to tap the data stored in the meter's memories at a scheduled time from any of the above mentioned ports or any other means and transmit the same to a remote central computer using suitable means of communication.

It shall be possible to securely download the ABT Meters data through an USB/RS-232 port via external storage thereby removing the requirement of a MRI. It shall be ensured that data transfer through USB/RS- 232 shall be unidirectional only i.e. from Meter to external storage device in an authentication process.

Meter data shall be tamper-proof.

All meters shall be compatible with Optical port, RS-485 port, Ethernet port and USB/RS-232 all together at a time and communicate independently.

Data collection from any local laptop shall be possible by installing data collection software.

27. Laptop as a Meter Reading Instrument

One Laptop with BCS software for downloading of meter data shall be provided free of cost. One Optical to USB cable shall be provided.

28. Software

The Bidder shall provide the necessary web based software which would enable Remote workstations to:

Accept the data from the Ethernet/WAN and store it in its memory in user defined formats (text, csv, xls, etc.) in a user-defined file name.

Polling feature along with a task scheduler to run the data downloading software at a pre-designated date and time repeatedly or by manually selecting a meter. File naming for such downloaded data should also be in user-defined format. A detailed activity log shall also be available for each downloading operation.

Upload/Import meter data (binary files) in the software for further processing. While uploading, there shall be provision to upload all selected files automatically and with single key-stroke when uploaded manually.

The file conversion of binary file(s) to text file(s) shall be automatic. If done manually in some case then there should be provision to select multiple files based on filename, convert all selected files with single key-stroke and store the text files in the same location where binary files are stored.

Display the collected data on PC's screen in text format, with forward/backward rolling.

Print out in text format the data collected from one or more meters, starting from a certain date and time, as per operator's instructions.

Transmit the collected data, in binary format, through an appropriate communication link to the central computer, starting from a certain date and time, as per operator's instructions.

Store the collected data in binary format on Pen Drive. In addition to above, in general the software shall be able to convert ABT Meters data to existing format as well as in tabular (.csv) format as applicable.

The above software shall further ensure that absolutely no tampering (except erasing of complete data with password protection) of the collected metering data is possible during its handling by the PC. The web based software shall be suitable for the commonly available PCs (Window based) at the various RSS.

The bidder shall ensure data integrity checks on all metered data received fromdata collection systems.

The web based software provided will manage all functionalities of collection of data through DCUs, validate the data, store the data in a database, and manage the complete system. Software will also have a scheduler for scheduling the task of collection of data periodically. The periodicity of data collection shall be user defined.

29. Quality Assurance

The quality control procedure to be adopted during manufacturing of the specified equipment shall be mutually discussed and finalized in due course, generally based on the established and proven practices of the manufacturer.

The web based software shall be user friendly which can be easily installed in any PC/Laptop irrespective of operating system of the PC/Laptop, and shall be certified for ensuring data handling capabilities. The same shall be demonstrated by the party during technical evaluation.

During demonstration tenderer shall bring standard meter. Thereafter software shall be offered for technical compatibility before taking up further necessary action in the procurement process.

30. Testing

All equipment, after final assembly and before dispatch from manufacturer's works, shall be duly tested to verify that it is suitable for dispatch. Routine and acceptance tests shall be carried out on the meters in line with IS 14697.

Any meter which fails to fully comply with the specification requirements shall be liable to be rejected by the BEST Undertaking.

Acceptance Tests for PC Software and data down loading using meter communication ports-All ABT Meters after final assembly and before dispatch from Bidder's/Manufacturer's works shall be duly tested to verify that they are suitable for downloading data using meter communication ports shall be subjected to the following acceptance test.

Downloading Meter Data from the Meter(s) to Laptop via optical port with Optical to USB cord.

Downloading meter data through USB/RS-232 port.

Downloading meter data to DCU through Ethernet port.

Down loading the meter data from remote PC through web based software.

Compatibility with PC Software.

Functioning of Time synchronization, advance and retard time commands.

Meter downloading time verification.

Copy of Test certificate shall be submitted to BEST Undertaking.

31. Type Test

Meter shall be Type tested as per IS: 14697:1999 with latest amendments and CBIP Publication No 325 wherever applicable.

The type test report submitted shall be of the same type and design of the meter offered.

Test Certificate from CPRI/Government approved NABL Accredited Laboratory for meters conforming to IS: 15959/ DLMS- Indian Companion Standard shall be submitted along with the offer.

Type test shall be carried out from laboratories which are accredited by NABL of Government India.

In case of supplier having own NABL accredited lab, the type test certificate furnished with tender from such lab shall not be accepted (i.e. Type test certificate from own NABL Lab). In such case the tenderer shall furnish the type test certificate from other NABL accredited lab.

The Type test certificates shall not be more than 36 months old on date of opening of bid.

A copy of the Type test results shall be enclosed with the offer.

Type test report shall clearly indicate the constructional features of the type tested meter. **32.Other**

Acceptance Test

The meter shall pass following additional acceptance test in addition to the acceptance test specified in IS: 14697:1999.

Power consumptions

Verification of downloaded data.

Impulse Voltage: The meter shall withstand impulse voltage of 10kV Peak without any damage in line with Clause No. 12.7.6.2 of IS: 14697:1999. The necessary test certificates to be submitted.

All meters supplied in subsequent lot shall be confirming to all the features and design of approved tender sample meter.

33. BIS Certificate

Tenderers shall furnish valid BIS certification along with the offer.

34. Minimum Testing Facilities

Manufacturer should possess fully computerized meter test bench system for carrying out routine and acceptance tests as per IS: 14697:1999 and CBIP Publication No. 325.In addition, this facility should produce test reports for each and every meter.

The Manufacturer should have the necessary minimum testing facilities for carrying out the following tests. i) AC Voltage Test. ii) Insulation Resistance Test. iii) Test Limits of Errors. iv) Test on Meter Constants.

v) Test of Starting Condition.
vi) Test of No-load Condition.
vii) Repeatability of Error Test.
viii) Test of Power Consumption.
ix) Vibration Test. x) Shock Test.
xi) The manufacturer should have duly calibrated reference standard meter of class 0.02 or higher accuracy. xii) 10kV Impulse Voltage Test facility. xiii) Test for Influence Quantity.
xiv) AC & DC Magnetic Influence Test.
xv) 35kV Test.

35. Pre-Dispatch Inspection at factory works

The undertaking reserves the right to inspect/test each lot of meter at the supplier's works.

The supplier shall offer every lot for inspection prior to dispatch by our inspecting officers at their works.

The intimation regarding inspection of the lot shall be given 15 days in advance.

All tests and inspection shall be carried out as per IS: 14697:1999 and CBIP Publication No. 325 with latest amendments if any and BEST requirements.

Prototype Inspection:-The Prototype inspection is applicable for this particular tender and the Undertaking's officers shall visit the firm's factory premises to inspect quality of Prototype produced and the Undertaking shall bear the expenditure of to and fro travelling, lodging and boarding of the Undertaking's two inspecting officers. The Prototype meters will be carefully preserved by BEST Undertaking for the guarantee period of five years. If any deviation is observed in the meter supplied by the Tenderer in subsequent lot, the meter(s) with deviation will be liable to be rejected.

Lot Inspection:-The Lot Inspection is applicable for one Lot preferably first for this particular tender and the Undertaking's officers shall visit the firm's factory premises to inspect the quality of Lot produced and the Undertaking will bear the expenditure of to and fro travelling, lodging and boarding of the Undertaking's two inspecting officers. For subsequent visits required, if any, the Undertaking will bear the expenditure.

36. Inspection and Testing after receipt of meters at Stores

Each meter supplied will be tested as per this specification at meter testing laboratory at BEST Undertaking. The meter is liable to be rejected if fails in acceptance test as per IS: 14697:1999 with latest amendment and Specification of BEST Undertaking.

37. Test Reports.

Each meter shall be tested against the RSM having the traceability with NABL or its associated bodies. Each meter factory test report shall be supplied in soft copy on CD in the format given by BEST.

38. Tender Sample

Tenderer shall submit 2 sample meters.

After successful passing the tests carried out at BEST laboratory the tenderer shall give the demonstration of the meter offered against the tender to demonstrate the features incorporated in the meter.

Sample meter submitted against the tender by successful tenderer will not be returned to the supplier till the completion of guarantee period.

The tender sample meters will not be considered in the ordered quantity.

39. Guarantee

Guarantee of 7.5 years from the date of dispatch or 7 years from date of commissioning, whichever is earlier Manufacturer shall undertake a guarantee to replace meter up to a period of 7 Year from the date of supply. The meters which are found defective/inoperative within the guarantee period shall be replaced as per meter service level agreement.

The defective Meters shall be collected by the successful tenderer from H V C d e p t . a nd then deliver either by replacement or after repairing.

40. Packing

Carton Number, Purchase Order Number, BEST meter numbers, manufacturer serial numbers and quantity of meters shall be mentioned on each packing box/cartoon.

The meters shall be serially packed and starting to end serial numbers shall be mentioned on each box/carton.

41. Technical Support

The tenderer shall depute their engineers at free of cost for technical support needed during analysis of defective meter cases, meter tampering cases etc. whenever called upon. The supplier shall submit their analysis report within 15 days period.

The tenderer shall depute their engineers for necessary software requirements, BEST MRI configuration with the meter, ASCII billing etc.to our user department.

42. Documents to be uploaded along with the offer

The List of documents / Certificates to be submitted / uploaded in soft format along with the offer as per various Clauses of BEST Specification No. MR/SMART-SPEC/PP-/1A,-/5A,(-/110)V CTPTO ABT/1/2019-20 is described in Annexure A-1.

43. Guaranteed Technical Particulars

The tenderer shall furnish the particulars giving specific required details of Meter in Annexure A-2 attached. The offers without the details in stands rejected.

44. General

The meter shall be supplied with latest/compatible software (shall be compatible with old & new meters data download handling). Any new software as required to be installed within warranty period are to be done by party or through remote support to client.

The total arrangement shall be such that one (1) operation (click on “data download from meter” button on software) can carry out the whole operation in about five (5) minutes per meter or preferably faster.

The layout of software front end / user interface has to be approved by BEST during technical evaluation / demonstration. However a standard template sheet will be provided along with bid for reference.

Above specification is minimum only, any higher standard required for the purpose intended (meter data handling) would be assessed by vendor and would be supplied accordingly. The detailed architecture shall be approved during drawing approval stage.

Meter shall be accommodated in existing C&R panel of standard size (Alstom / ER / ABB / Siemens) or C&R panel with door closed.If required before bidding, bidder may collect necessary data or else the scope is deemed to be included.

Step by Step procedure (on screen shot type and desktop video capture) shall be provided for Installation /

Re-installation of Database handling software in to Laptop / PC

Meter maintenance / site-testing procedure as per relevant IS/IEC standard.

Procedure for data downloading from Meter by Laptop / Desktop PC.

As on date of delivery, the supplied meters shall comply with all statutory regulation as required under CERC / CEA / IEGC as applicable and the same should be declared by the vendor during delivery along with warranty certificate.

Annexure-K

Smart Meters DPR																							
Sr. No.	DPR Description	Proposed Capital Cost (Rs.Cr)	Capex (Rs.Cr)	Capitalization (Rs.Cr)	CWIP (Rs.Cr)	Capex Plan (Rs.Cr)									Capitalization Plan (Rs.Cr)								
						FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32	FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32
1	Prepaid Smat Meter	1303.16	1204.28	1204.28	0.00	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
	Total	1303.16	1204.28	1204.28	0.00	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38

Tariff Impact - Unapproved DPRs

Scheme Name	Capital Expenditure & Capitalisation								
	FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32
Phasing of approved DPR	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
IDC	-	-	-	-	-	-	-	-	-
Total capitalisation (incl. IDC)	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
GFA statement									
Opening balance	-	47.51	183.99	344.56	505.13	665.70	826.27	986.84	1,099.90
Addition	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
Closing balance	47.51	183.99	344.56	505.13	665.70	826.27	986.84	1,099.90	1,204.28
Equity statement									
Opening balance	-	14.25	55.20	103.37	151.54	199.71	247.88	296.05	329.97
Addition	14.25	40.94	48.17	48.17	48.17	48.17	48.17	33.92	31.31
Closing balance	14.25	55.20	103.37	151.54	199.71	247.88	296.05	329.97	361.28
Revenue expenses									
Interest on debt	1.68	8.06	17.92	27.81	26.34	25.32	24.30	21.60	20.28
Return on Equity	1.10	6.08	13.87	22.30	30.73	39.16	47.59	54.78	60.48
Depreciation (Avg. rate of 9%)	2.14	10.42	23.78	38.24	52.69	67.14	81.59	93.90	103.69
Running Expenses (@2.97% of av GFA)	0.71	3.44	7.85	12.62	17.39	22.16	26.92	30.99	34.22
Income Tax (@ 0% on grossed up RoE)	-	-	-	-	-	-	-	-	-
Total (Rs. Cr)	**5.63**	**27.99**	**63.43**	**100.97**	**127.15**	**153.78**	**180.41**	**201.27**	**218.67**
Projected Sales (MU)	4,756.54	4,780.33	4,804.23	4,828.25	4,852.39	4,876.65	4,901.04	4,925.54	4,950.17
Total Impact per unit of sales (Rs./unit)	**0.012**	**0.059**	**0.132**	**0.209**	**0.262**	**0.315**	**0.368**	**0.409**	**0.442**
OPEX SCHEME									
Total Impact per unit of sales (Rs./unit)	**0.100**	**0.286**	**0.334**	**0.333**	**0.331**	**0.329**	**0.328**	**0.230**	**0.211**

IDC and Interest - Unapproved DPRs

IDC Calculation

Particulars	FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32
Opening CWIP	0.00	-	-	-	-	-	-	-	-
Fresh capex	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
Capitalisation	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
Closing CWIP	-	-	-	-	-	-	-	-	-

Normative debt utilisation statement

Particulars	FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32
Opening balance	-	-	-	-	-	-	-	-	-
Drawal towards capex	33.26	95.54	112.40	112.40	112.40	112.40	112.40	79.14	73.07
Utilised for asset capitalisation	33.26	95.54	112.40	112.40	112.40	112.40	112.40	79.14	73.07
Normative debt lying in CWIP	-	-	-	-	-	-	-	-	-
Interest Rate for Normative Debt	10.50%	10.50%	10.50%	10.50%	10.50%	10.50%	10.50%	10.50%	10.50%

	Computation of IDC (first charge method) - Normative debt	FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32
Stream 1	Opening balance	-								
	Drawl	-								
	Capitalised	-								
	Closing balance	-								
	Interest chargeable to IDC - to be capitalised	-								
	Opening balance	-								
	Drawl	33.26								
	Capitalised	33.26								
	Closing balance	-								
	Interest chargeable to IDC - to remain in CWIP	0.00								
	Opening balance	0.00								
	Drawl	-								
	Capitalised	0.00								
	Closing balance	-								
	Interest chargeable to IDC - to remain in CWIP	0.00								
Stream 1: Total interest to be capitalised		-								
Stream 2	Opening balance		-							
	Drawl		-							
	Capitalised		-							
	Closing balance		-							
	Interest chargeable to IDC - to be capitalised		-							
	Opening balance		-							
	Drawl		95.54							
	Capitalised		95.54							
	Closing balance		-							
	Interest chargeable to IDC - to be capitalised		-							
	Opening balance		-							
	Drawl		-							
	Capitalised		-							
	Closing balance		-							
	Interest chargeable to IDC - to remain in CWIP		-							
Stream 2: Total interest to be capitalised			-							
Stream 3	Opening balance			-						
	Drawl			-						
	Capitalised			-						
	Closing balance			-						
	Interest chargeable to IDC - to be capitalised			-						
	Opening balance			-						
	Drawl			112.40						
	Capitalised			112.40						
	Closing balance			-						
	Interest chargeable to IDC - to be capitalised			-						
	Opening balance			-						
	Drawl			-						
	Capitalised			-						
	Closing balance			-						
	Interest chargeable to IDC - to remain in CWIP			-						
Stream 3: Total interest to be capitalised				-						
Stream 4	Opening balance				-	-	-	-	-	-
	Drawl				-	-	-	-	-	-

	Capitalised				-	-	-	-	-	-
	Closing balance				-	-	-	-	-	-
	Interest chargeable to IDC - to be capitalised				-	-	-	-	-	-
	Opening balance				-	-	-	-	-	-
	Drawl				112.40	112.40	112.40	112.40	79.14	73.07
	Capitalised				112.40	112.40	112.40	112.40	79.14	73.07
	Closing balance				-	-	-	-	-	-
	Interest chargeable to IDC - to be capitalised				-	-	-	-	-	-
	Opening balance				-	-	-	-	-	-
	Drawl				-	-	-	-	-	-
	Capitalised				-	-	-	-	-	-
	Closing balance				-	-	-	-	-	-
	Interest chargeable to IDC - to remain in CWIP				-	-	-	-	-	-
Stream 4: Total interest to be capitalised					-	-	-	-	-	-

Computation to interest chargeable to revenue account for normative debt, considering avg. depreciation as repayment

	Particulars	FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32
Stream 1	Opening balance	-	32.00	29.49	26.99	24.48	21.97	19.46	16.95	14.44
	Drawl	33.26	-	-	-	-	-	-	-	-
	Repayment	1.25	2.51	2.51	2.51	2.51	2.51	2.51	2.51	2.51
	Closing balance	32.00	29.49	26.99	24.48	21.97	19.46	16.95	14.44	11.93
	Interest	**1.68**	**3.23**	**2.97**	**2.70**	**2.44**	**2.18**	**1.91**	**1.65**	**1.38**
Stream 2	Opening balance		-	91.93	84.73	77.52	70.31	63.11	55.90	48.70
	Drawl		95.54	-	-	-	-	-	-	-
	Repayment		3.60	7.21	7.21	7.21	7.21	7.21	7.21	7.21
	Closing balance		91.93	84.73	77.52	70.31	63.11	55.90	48.70	41.49
	Interest		**4.83**	**9.27**	**8.52**	**7.76**	**7.00**	**6.25**	**5.49**	**4.73**
Stream 3	Opening balance			-	108.16	99.68	99.68	99.68	99.68	99.68
	Drawl			112.40	-	-	-	-	-	-
	Repayment			4.24	8.48	-	-	-	-	-
	Closing balance			108.16	99.68	99.68	99.68	99.68	99.68	99.68
	Interest			**5.68**	**10.91**	**10.47**	**10.47**	**10.47**	**10.47**	**10.47**
Stream 4	Opening balance				-	-	-	-	-	-
	Drawl				112.40	112.40	112.40	112.40	79.14	73.07
	Repayment				4.24	4.24	4.24	4.24	2.98	2.76
	Closing balance				108.16	108.16	108.16	108.16	76.16	70.31
	Interest				**5.68**	**5.68**	**5.68**	**5.68**	**4.00**	**3.69**

Borrowing for IDC and cost of funding thereon (normative borrowing for IDC considering avg. depreciation as repayment

	Particulars	FY 23-24	FY 24-25	FY 25-26	FY26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY31-32
Stream 1	Opening balance	-	-	-	-	-	-	-	-	-
	Drawl	-		-	-	-	-	-	-	-
	Repayment	-	-	-	-	-	-	-	-	-
	Closing balance	-	-	-	-	-	-	-	-	-
	Interest	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Stream 2	Opening balance		-	-	-	-	-	-	-	-
	Drawl		-	-	-	-	-	-	-	-
	Repayment		-	-	-	-	-	-	-	-
	Closing balance		-	-	-	-	-	-	-	-
	Interest		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Stream 3	Opening balance			-	-	-	-	-	-	-
	Drawl			-	-	-	-	-	-	-
	Repayment			-	-	-	-	-	-	-
	Closing balance			-	-	-	-	-	-	-
	Interest			**-**	**-**	**-**	**-**	**-**	**-**	**-**
Stream 4	Opening balance				-	-	-	-	-	-
	Drawl				-	-	-	-	-	-
	Repayment				-	-	-	-	-	-
	Closing balance				-	-	-	-	-	-
	Interest				**-**	**-**	**-**	**-**	**-**	**-**
	Total Interest	**1.68**	**8.06**	**17.92**	**27.81**	**26.34**	**25.32**	**24.30**	**21.60**	**20.28**

Cost Benefit Analysis (CBA) of Smart Meters:

For benefits of the Smart Meters kindly refer Para 7 & 8.

Further to this, there are wide benefits of Smart Meters to customers, the state, and utilities and same are as as follows:

1. BEST undertaking has authorized the M/s. Adani Transmission Ltd. (ATL) to replace about 10.80 Lakh conventional / static customer meters with Smart Meters in order to give consumers greater control over their energy use. Smart Meters enable a utility to provide customers with detailed information about their energy usage at different times of the day, which in turn enables customers to manage their energy use more proactively.

2. Allows for faster outage detection and restoration of service by a utility when an outage occurs and therefore, less disruption to a customer's home or business.

3. Provides customers with greater control over their electricity use when coupled with time-based rates, increasing the range of different pricing plans available to customers and giving them more choice in managing their electricity consumption and bills.

4. Smart Meters enable a utility to measure a customer's electricity usage in hourly increments.

5. If a customer elects to participate in time-based rates offered by the utility, they have the opportunity to lower their electricity demand during "peak" periods (the peak period for most utilities are summer afternoons) and potentially save money on their monthly electric bill.

6. Allows customers to make informed decisions by providing highly detailed information about electricity usage and costs. Armed with a better understanding of their energy use, consumers can make informed decisions on how to optimize their electricity consumption and reduce their bills.

7. In the near future, by installing an in-home display device that communicates wirelessly with a Smart Meter, a customer could monitor their electricity usage and costs in real-time, allowing them to adjust their usage instantaneously in response to changes in prices or system reliability events, for example by delaying the use of a high-energy appliance or shutting it off. This could be done manually or automatically by pre-programming the device or appliance.

8. Helps the environment by reducing the need to build power plants, or avoiding the use of older, less efficient power plants as customers lower their electric demand.

9. This is beneficial for all utility customers because the costs of building new power plants or relying on older, less-efficient power plants are eventually passed on to customers in retail rates.

10. Building power plants that are necessary only for occasional peak demand is very expensive. A more economical approach is to enable customers to reduce their demand through time-based rates or other incentive programs.

11. Increases privacy because electricity usage information can be relayed automatically to the utility for billing purposes without on-site visits by a utility to check the meter. This also results in lower operational costs for the utility, which means savings for customers as utility rates reflect the utility's cost to operate. In addition, as technology improves and changes over time, customers can receive the benefit of those changes without the utility having to replace the meter itself.

Annexure - 'G'

Project Department
Inward No. 543
Date 21/3/12

BRIHANMUMBAI ELECTRIC SUPPLY & TRANSPORT UNDERTAKING
(OF THE BRIHANMUMBAI MAHANAGARPALIKA)

-ACCOUNTS DEPARTMENT-

DEPARTMENTAL CIRCULAR

Ref.No. Dy.CAO(Sr.)/ 47 /2012

Date : 14.03.2012

Sub : Depreciation procedure in respect of calculating and charging as per MERC(Multi Year Tariff) Regulations, 2011

The Straight Line Method of depreciation on Undertaking's assets was approved vide BCR No. 470 dated 13.09.1968 and CR No. 659 dated 10.10.1968 and accordingly procedure was laid down for calculation and charging of depreciation. Under the Straight Line Method of depreciation, rates for complete years are taken into account. Life of the asset as provided in Income Tax Act is generally adopted for working out the depreciation provision in respect of assets in the Undertaking pertaining to the General Administration and Transport Division. Earlier, in case of Electric Supply Division, the life of the assets is considered as per the provisions of Electric Supply Act 1948 and thereafter due to promulgation of Electricity Act 2003, it is considered as per the MERC's (Terms & Conditions of Tariff) Regulations 2005. The depreciation is provided from the year in which asset is acquired and therefore, the depreciation is provided for the full financial year in which the asset is acquired irrespective of date or the month in which the asset is acquired. Thus, the Depreciation is provided uniformly at every financial year right from the year of the purchase till the life of asset is completed. The depreciation is provided on the acquisition/purchase cost of the assets after taking into consideration residual value of the asset which is estimated at 10% of the acquisition/purchase cost. As such in any case Undertaking do not provide depreciation more than 90% of the book value of the asset.

The above procedure is now changed due to MERC (Multi Year Tariff) Regulations, 2011

1) Due to introduction of MERC (Multi Year Tariff) Regulations, 2011, the rate of depreciation in case of Electric Supply Division assets is changed in many of the assets. As per Depreciation schedule appended to MERC (Multi Year Tariff) Regulations, 2011, the life of most of the assets has been reduced and to that extent the rate of depreciation is increased. The details of rate of depreciation and life of each asset is shown in Annexure (Enclosed). Further, as 50% of assets under the General Administration are allotted to Electric Supply Division and hence it is decided by the Administration to adopt the new depreciation rate also for General Administration Department. In case of Bus Division assets, there is no change in the existing rate of Depreciation.

2) Further, as per the of MERC (Multi Year Tariff) Regulations, 2011, the new rate of depreciation is applicable for those existing assets where such assets are depreciated to the extent of 70% and remaining 20% shall be spreadover for the balance useful life of the asset.

3) As per the existing policy, the depreciation is provided for the asset procured during the financial year, irrespective of date or month in which assets are acquired / capitalized. Further, MERC is also allowing the depreciation on the Opening Gross Fixed Assets only. As such, it is decided by the Administration that from F.Y. 2011-12, the depreciation will be charged on the Opening Gross Fixed Assets only for all three Divisions viz General Administration, Electric Supply and Buses

In view of the above, the Administration has decided to adopt the following procedure for calculation and charging of Depreciation provision from F.Y. 2011-12 :-

a) From F.Y. 2011-12, no depreciation provision will be provided for assets which are purchased during the financial year for all three Divisions, viz., General Administration, Electric Supply and Buses.

b) To apply new depreciation rate for the assets which are capitalized / purchased from FY 2011-12 onwards for Supply & General Administrative Division.

c) New depreciation rates are applicable for providing depreciation provision only and not for scrapping of assets.

d) There is no change in the existing rate of depreciation in case of Bus Division.

e) The assets capitalized / purchased prior to F.Y. 2011-12, new rates of depreciation are applicable only on those assets of Electric Supply and General Administration Division where 70% asset value is depreciated.

This issues with the approval of the General Manager.

Encl : Annexure

S. J. Darne
Dy.C.A.O.(Sr.)

TO : ALL HEADS OF DEPARTMENTS / BRANCHES

Shd/dep prov(1)

Annexure-II

DEPRECIATION SCHEDULE

For Assets of Supply & General Administration Division

		Description of Assets Depreciation	As per Regulation 2005	Life	Depreciation (Straight line) 2011	Life
A.		Land owned under full title	-			
			-			
B.		Land held under lease	-			
a)		for investment in the land	-		3.34	27
b)		for cost of clearing the site	-		3.34	27
c)		Land for reservoir in case of Hydro Generating Station	-		3.34	27
C.		Assets Purchased New:				
a.		Plant and machinery in Generating Stations including plant foundations				
	i)	Hydro-electric	2.57	35	5.28	17
	ii)	Steam electric	3.60	25	5.28	17
		NHRS &Waste Heat Recovery Boilers/Plants				
	iii)	Diesel-electric and gas plant	6.00	15	5.28	17
b.		Cooling towers and circulating water systems	3.60	25	5.28	17
c.		Hydraulic works forming part of Hydro-electric systems including:-				
	i)	Dams, Spillways, weirs, canals, reinforced concrete flumes and siphons	1.80	50	5.28	17
	ii)	Reinforced concrete pipelines and surge tanks, steel pipelines, sluice gates, steel surge (tanks) hydraulic control valves and other hydraulic works	2.57	35	5.28	17
d.		Building & civil engineering works of permanent character				
	i)	Offices & showrooms	1.80	50	3.34	27
	ii)	Containing thermo-electric generating plant	3.60	25	3.34	27
	iii)	Containing hydro-electric generating plant	2.57	35	3.34	27
	iv)	Temporary erection such as wooden structures	18.00	5	100	0.9
	v)	Roads other than kutcha roads	1.80	50	3.34	27
	vi)	Others	1.80	50	3.60	25

		Description of Assets Depreciation	As per Regulation 2005	Life	Depreciation (Straight line) 2011	Life
e.		Transformers, transformer (Kiosk) sub-station equipment & other fixed apparatus (including plant foundations)				
	i)	Transformers (including foundations) having a rating of 100 kilo volt amperes and over	3.60	25	5.28	17
	ii)	Others	3.60	25	5.28	17
f.		Switchgear including cable connections	3.60	25	5.28	17
g.		Lightning arrestors				
	i)	Station type	3.60	25	5.28	17
	ii)	Pole type	6.00	15	5.28	17
	iii)	Synchronous condensor	2.57	35	5.28	17
h.		Batteries	18.00	5	5.28	17
	i)	Underground Cable including joint boxes and disconnected boxes	3.60	25	5.28	17
	ii)	Cable duct system	1.80	50	5.28	17
i.		Overhead lines including supports:				
	i)	Lines on fabricated steel operating at nominal voltages higher than 66 kV	2.57	35	5.28	17
	ii)	Lines on steel supports operating at nominal voltages higher than 13.2 kilovolts but not exceeding 66 kilovolts	3.60	25	5.28	17
	iii)	Lines on steel or reinforced concrete supports	3.60	25	5.28	17
	iv)	Lines on treated wood supports	3.60	25	5.28	17
j.		Meters	6.00	15	5.28	17
k.		Self propelled vehicles	18.00	5	9.50	9.47
l.		Air conditioning plants:				
	i)	Static	6.00	15	5.28	17
	ii)	portable	18.00	5	9.50	9.47
m						
	i)	Office furniture and fittings	6.00	15	6.33	14
	ii)	Office equipments	6.00	15	6.33	14
	iii)	Internal wiring including fittings and apparatus	6.00	15	6.33	14
	iv)	Street light fittings	6.00	15	5.28	17
n		Apparatus let on hire				
	i)	Other than motors	18.00	5	9.50	9.47
	ii)	Motors	6.00	15	6.33	14
o.		Communication equipment:				
	i)	Radio and high frequency carrier system	6.00	15	6.33	14
	ii)	Telephone lines and telephones	6.00	15	6.33	14
p.		I.T. equipments	No change	6	15	6
q.		Assets purchased second hand and assets not otherwise provided for in the Schedule	No change	17	5.28	17

THE BRIHANMUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING
(OF THE MUNICIPAL CORPORATION OF GREATER MUMBAI)

ACCOUNTS DEPARTMENT

Life in years adopted for working out depreciation provision/depreciated value on assets of the Gen. Administration / Transport / Electric Supply Division

			PROPOSED LIFE FROM 2012 - 13	
	SCH. 'A'		SCH. 'B'	
GENERAL ADMINISTRATION	Life in year old	Rates % as per BEST	life as per MERC	Rates % as per MERC
BUILDING (fr. 1977-78 onward dep. Cal. As per sch B))	45	2%	27	3.34%
STATIC ROOM A.C. (seperated from building)	15	6%	17	5.28%
MOTOR VEHICLES	8	11.25%	8	11.25%
TOOLS & EQUIPMENT (fr. 1998-99 onward dep. Cal. As per sch.B)	18	5%	17	5.28%
FURNITURE & OFFICE EQUIP. (fr. 1998-99 dep. Cal. As per sch.B)	18	5%	14	6.33%
PORTABLE A.C. (seperated fr. off. Equip) (fr.2007-08 dep. Cal. As per sch.B)	7	12.86%	9	9.50%
PLANT & MACHINERY (stores dept)	22	4.09%	17	5.28%
PLANT & MACHINERY (In House Computer)	10	9%	17	5.28%
PLANT & MACHINERY (In House Computer) from 2005-06	6	15%	17	5.28%
PLANT & MACHINERY (In House Computer) from 2008-09	--	--	17	5.28%
PERSONAL COMPUTER / PRINTER/ UPS	7	12.86%	6	15%
PERSONAL COMPUTER / PRINTER/ UPS (From 2005-06)	6	15%	6	15%
ELECTRONIC EQUIPMENT (Seperated from office Equipment) (fr. 2003-04 onward dep. Cal. as per sch.B)	12	7.50%	6	15%
CYCLOSTYLE MACHINE / XEROX MACHINE (fr.2005-06 onward dep. Cal. as per sch.B)	10	9%	6	15%
SECURITY EQUIPMENT (fr 1992-93 onward dep.cal. As per sch.B)	100	0.90%	17	5.28%
FAX MACHINE	7	12.86%	6	15%

BUSES	Life in year old	Rates % as per BEST
BUILDING	45	2%
BUS CHOWKIES & BUS 'Q' SHELTERS	20	4.50%
STATIC A.C. (Sepereated from building)	15	6%
BUSES (fr.2005 - 06 onward)	12	7.50%
M.O.H. OF BUSES	4	25%
MOTOR VEHICLES	8	11.25%
M.O.H. OF MOTOR VEHICLES	4	25%
TOOLS & EQUIPMENTS	18	5%
FURNITURE & OFFICE EQUIPMENT	18	5%
PORTABLE ROOM A.C.(Seperated from office equipment)	7	12.86%
ELECTRONIC EQUIPMENT (seperated from office equipment)	12	7.50%
PLANT & MACHINERY & EQUIPMENTS	22	4.09%
PERSONAL COMPUTER / PRINTER/ UPS (Prior to 2005-06)	7	12.86%
P.C. (Seperated from office equipments) from 2005-06	6	15%
P.C. (Seperated from office equipments) from 2006-07	5	18%
HAND PAGING MACHINE	5	18%
NUMBERING BOXES	8	11.25%
XEROX MACHINE	10	9%
FAX MACHINE	7	12.86%
ELECTRONIC EQUIPMENT (seperated from Machine Tools)	12	7.50%

	SCH. 'A'		PROPOSED LIFE FROM 2012 - 13 SCH. 'B'	
ELECTRIC SUPPLY	Life in year old	Rates % as per BEST	life as per MERC	Rates % as per MERC
BUILDING	50	1.80%	27	3.34%
BUILDING (from 1993-94) (fr 1973-74 onward as per sch B)	45	2%	27	3.34%
BILL COLLECTION CHOWKEY	20	4.50%	--	--
STATIC A.C. (seperated from bldg.)	15	6%	17	5.28%
CABLES & MAINS	40	2.25%	17	5.28%
CABLES & MAINS (from 1994-95) (fr. 1981-82 onward as per sch. B)	35	2.57%	17	5.28%
CAPACITORS (fr.2005-06 onward as per sch.B)	10	9%	17	5.28%
STRET LAMPS (fr. 2001-02 onward as per sch.B)	15	6%	17	5.28%
SCADA (fro 2003-04 onward as per sch.B)	12	7.50%	6	15%
METERS & INSTALLATION (Conventional)	15	6%	17	5.28%
METERS & INSTALLATION (Static & Electronics) (fr. 2001-02 onward as per sch.B)	15	6%	8	11.25%
SWITCHGEAR & MACHINERY	20	4.50%	17	5.28%
SWITCHGEAR & MACHINERY (fr.1994-95)(fr.1994-95 onward as per sch B)	25	3.60%	17	5.28%
BATTERIES	10	9%	17	5.28%
BATTERIES (fr 1994 95) (fr.2009-10 onward as per sch.B)	5	18%	17	5.28%
DISTRIBUTION PILLARS (fr 1997-98 onward as per sch.B)	20	4.50%	17	5.28%
TRANSFORMERS	35	2.57%	17	5.28%
TRANSFORMERS (fr 1994-95) (fr.1985-86 onward as per sch.B)	25	3.60%	17	5.28%
D.E.A. ON HIRE (fr 2011-12 onward as per sch.B)	7	12.86%	17	5.28%
MOTOR VEHICLES	7	12.86%	--	--
MOTOR VEHICLES (fr.1993-94)	8	11.25%	8	11.25%
MACHINE TOOLS	20	4.50%	--	--
MACHINE TOOLS (fr 1993-94) (fr.1998-99 onward as per sch.B)	18	5%	17	5.28%
ELECTRONIC EQUIPMENTS (seperated fr.Machine Tools) (fr.2003-04 onward as per sch.B)	12	7.50%	6	15%
FURNITURE	20	4.50%	14	6.33%
FURNITURE (fr 1993-94) (fr.1997-98 onward as per sch.B)	18	5%	14	6.33%
OFFICE EQUIPMENTS (prior to 1993-94)	10	9%	14	6.33%
OFFICE EQUIPMENTS (fr 1993-94) (fr.1998-99 onward as per sch B)	18	5%	14	6.33%
PORTABLE A.C. (seperated fr. Office equipments)	7	12.86%	9	9.50%
PORTABLE A.C. (seperated fr. Office equipments 1993-94) (fr.2009-10 onward as per sch.B)	5	18%	9	9.50%
P.C. (seperated from office equip.)	7	12.86%	6	15%
P.C. (seperated from office equip.2005-06)	6	18%	6	15%
CYCLOSTYLE CUM PHOTO COPIER MACHINE (seperated from off. Equip) (fr.2005-06 onward as per sch.B)	10	9%	6	15%
ELECTRONIC EQUIPMENTS (seperated fr.Off. Equip.) (fr.2003-04 onward as per sch.B)	12	7.50%	6	15%
FAX MACHINE	7	12.86%	6	15%
BPAP (business Process Automation Project)	--	--	6	15%
HAND CART	--	--	5	18%
Assets Purchases Second hand & Assets Not otherwise provided for in the schedule	17	5.28%	17	5.28%

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21/C

-ACCOUNTS DEPARTMENT-

DEPARTMENTAL CIRCULAR

Ref.No:Dy.CAO(Sr.)/ 5870 /2015 Date: 28-1-2015

Sub: Movable assets - Procedure for scrapping unserviceable assets, disposal of scrap and Writing off the loss of cash due to Fire / Riot / Flood / Assault etc – Book value thereof.

Ref : B.C.R. No.311 dtd.15-12-2014

The Government of Maharashtra vide G.R.No.46 dtd. 04-08-2012 amended the M.M.C. Act 1888 in various sections and same is noted by the BEST Committee vide BCR No.141 dated 14-8-2014. These amendments were also circulated vide note No.GM/13/128/2014 dated 12-9-2014 by then G.M. The section 460 (Q) pertains to powers to dispose off movable property not exceeding Rs.2,000/- . Prior to this, BEST Committee have formulated the procedure as regards disposal of movable property, vide BCR No. 420 dated 22.7.1955. In addition to this, while discussing the item No.42 dated 13-6-2014, one of the Committee Member suggested to delegate the power to the G.M. for writing of shortage of loss of revenue due to Fire/ Flood /Riot / Assault etc., to the extent of Rs.10,000/-. The said proposal was approved by the BEST Committee vide B.C.R. No.311 dated 15-12-2014. Accordingly the revised procedure is required to be followed by all Departments with immediate effect.

......2.......

a) <u>Scrapping of movable assets</u> – When any movable asset is considered to be unserviceable or unwanted, the Departmental Head will put up a proposal for scrapping duly certified by the Internal Audit. If the depreciated value of such asset in each instance does not exceed Rs.10,000/- , the proposal to be submitted to the General Manager for sanction and if exceed Rs.10,000/- the sanction of the committee to be obtained.

b) <u>Writing off the loss of cash</u> – To write off shortage amount for loss of cash due to Fire/ Flood /Riot / Assault etc., the Departmental Head will put up a proposal for writing off duly certified by the Internal Audit. If the writing off amount for loss of cash due to Fire/ Flood /Riot / Assault etc., in each instance does not exceed Rs.10,000/-, the proposal to be submitted to the General Manager for sanction and if exceed Rs.10,000/- the sanction of the committee to be obtained.

All the Heads of Branches / Departments are requested to bring the above mentioned procedure to the notice of staff working under them and give wide publicity to this Circular.

This circular is issued with the approval of the General Manager.

28/1/15

(A.A. Kantharia)
Dy.Chief Accounts Officer(Sr.)

<u>To : All Heads of Branches / Departments</u>

28/1/15
CA

kadam/movable assets

3

Book value × unexpired Life 3/6
Estimate Life

THE BRIHANMUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING
(OF THE MUNICIPAL CORPORATION OF GREATER MUMBAI)

ACCOUNTS DEPARTMENT

Life in years adopted for working out depreciation provision/depreciated value on assets of the Gen. Administration / Transport / Electric Supply Division.

Proposed life from **2012-13**

GENERAL ADMINISTRATION	Life in year	Rates % as per BEST	life as per MERC	Rates % as per MERC
Building	45	2%	27	3.34%
Static Room A.C. (**seperated from Building**)	15	6%	17	5.28%
Motor Vehicles	8	11.25%	8	11.25%
Tools & Equipment	18	5%	17	5.28%
Furniture & Office Equipment	18	5%	14	6.33%
Portable A/c / (**seperated from office Equipment**)	7	12.86%	9	9.50%
Plant & Machinery **(Stores Dept)**	22	4.09%	17	5.28%
Plant & Machinery **(In house Computer)**	10	9%	17	5.28%
Plant & Machinery **(In house Computer) from 2005-06**	6	15%	17	5.28%
Personal Computer / Printer / UPS	7	12.86%	6	15%
Personal Computer / Printer / UPS **(from 2005-06)**	6	15%	6	15%
Electronic Equipment Seperated from Office Equipment	12	7.50%	6	15%
Cyclostyle Machine / Xerox Machine	10	9%	6	15%
Security Equipment	100	0.90%	17	5.28%
Fax Machine	7	12.86%	6	15%

BUSES	Life in year	Rates % as per BEST
Building	45	2%
Bus Chowkies & Bus 'Q' Shelters	20	4.50%
Static A.C. **(Seperated from Building)**	15	6%
Buses	12	7.50%
M.O.H. of Buses	4	25%
Motor Vehicles	8	11.25%
M.O.H. of Motor Vehicles	4	25%
Tools & Equipments	18	5%
Furniture & Office Equipments	18	5%
Portable Room A.C. **(Seperated from Office Equipment)**	7	12.86%
Electronic Equipment **(Seperated from Office Equipment)**	12	7.50%
Plant & Machinery & Equipments	22	4.09%
Personal Computer / Printer **/ UPS** prior to 2005-06	7	12.86%
P.C. **(Seperated from Office Equipments)** from 2005-06	6	15%
P.C. **(Seperated from Office Equipments)** from 2006-07	5	18%
Hand Paging Machine	5	18%
Numbering Boxes	8	11.25%
Xerox Machine	10	9.00%
~~Fax Machine~~	~~7~~	~~12.86%~~
Electronic Equipment (Seperated from Machine Tools)	12	7.50%

4

Proposed life from **2012-13**

ELECTRIC SUPPLY	Life in year	Rates % as per BEST	life as per MERC	Rates % as per MERC
Building	50	1.80%	27	3.34%
Building (from 1993-1994)	45	2.00%	27	3.34%
~~Bill Collection Chowkey~~	20	4.50%		
Static A.C. (Seperated from Bldg)	15	6%	17	5.28%
Cables & Mains	40	2.25%	17	5.28%
Cables & Mains (from 1994-1995)	35	2.57%	17	5.28%
Capacitors	10	9%	17	5.28%
Street Lamps	15	6%	17	5.28%
SCADA	12	7.50%	6	15%
~~Meters and Installation (Conventional)~~	~~15~~	~~6%~~	~~17~~	~~5.28%~~
Meters and Installation (Static and Electronic)	15	6%	8	11.25%
Switchgear & Machinery	20	4.50%	17	5.28%
Switchgear & Machinery (from 1994-1995)	25	3.60%	17	5.28%
Batteries	10	9%	17	5.28%
Batteries (from 1994-1995)	5	18%	17	5.28%
Distribution Pillars	20	4.50%	17	5.28%
Transformers	35	2.57%	17	5.28%
Transformers (from 1994-1995)	25	3.60%	17	5.28%
D.E.A. on hire	7	12.86%	17	5.28%
Motor Vehicles	7	12.86%		
Motor Vehicles (from 1993-1994)	8	11.25%	8	11.25%
Machine Tools	20	4.50%		
Machine Tools (from 1993-1994)	18	5%	17	5.28%
Electronic Equipment (Seperated from Machine Tools)	12	7.50%	6	15%
Furniture	20	4.50%	14	6.33%
Furniture (from 1993-1994)	18	5%	14	6.33%
Office Equipments (prior to 1993-94)	10	9%	14	6.33%
Office Equipments (from 1993-1994)	18	5%	14	6.33%
Portable A.C. (Seperated from office equipments)	7	12.86%	9	9.50%
Portable A.C. (Seperated from office equipments 1993-94)	5	18%	9	9.50%
P.C. (Seperated from office equipments)	7	12.86%	6	15%
P.C. (Seperated from office equipments 2005-2006)	6	15%	6	15%
Cyclostyle cum Photo Copier Machine (Seperated frm Office Equipments)	10	9%	6	15%
Electronic Equipment (Seperated from Office Equipments)	12	7.50%	6	15%
Fax Machine	7	12.86%	6	15%
BPAP (Business Process Automation Project)			6	15%
Hand Cart			5	18%

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The Brihanmumbai Electric Supply and Transport Undertaking (BEST)

DETAILED PROJECT REPORT
FY2022-23, FY2023-24, FY2024-25and FY2025-26
IN-PRINCIPLE CLEARANCEFOR CAPITAL INVESTMENT SCHEMES

BEST Scheme No: BEST/FY23/06

IMPLEMENTATION OF PREPAID SMART METERING PROJECT

INDEX

Abbreviation

AMI	Advanced Metering Infrastructure
AMI-SP	Advanced Metering Infrastructure-Service Provider
ABT	Availability Based Tariff
CT /PT	Current Transformer / Potential Transformer
DER	Distributed Energy Resource
DMS	Distribution Management System
DR	Demand Response
DSM	Demand Side Management
DT	Distribution Transformer
DBFOOT	Design, Built, Finance, Own, Operate & Transfer
EA	Energy Audit
GIS	Geographical Information System
HES	Head End System
HT	High Tension
LT	Low Tension
IT	Information Technology
MIS	Management Information System
NIC	Network Integration Card or Node
NTP	National Tariff Policy
NW	Network
O&M	Operation and Maintenance
PQ	Power Quality
BEST	Brihan Mumbai Electric Supply & Transport undertaking
RF	Radio Frequency
RTU	Remote Terminal Unit
SCADA	Supervisory Control and Data Acquisition
T&D	Transmission and Distribution
ToD	Time of Day
VAR	Volt Ampere Reactive
GoI	Govern of India
RDSS	Revamped Distribution Sector Scheme
AT&C	Aggregate Technical & Commercial
DISCOMs	Distribution Companies
ACS-ARR	Average cost of Supply –Aggregate Revenue Realised
TOTEX	Capital Expenditure + Operational Expenditure
CAPEX / OPEX	Capital Expenditure /Operational Expenditure
PPP	Public Private Partnership
DPR	Detail Project Report
LVCTO	Low Voltage Current Transformer Operated
MDMS	Meter Data Management System
NOMC	Network Operation Monitoring Centre
DCU /DACU	Data Concentrator Unit
ERP	Enterprise Resource Planning
OMS	Outage Management System
WPC	Wireless Planning & Co-ordination
WAN / NAN	Wide Area Network / Neighbourhood Area Network

1. INTRODUCTION:

1.1 The Government of India's initiatives like 'Make in India' and 'Smart Cities' need the efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas to concentrate by governments for the development of country. The government cannot take initiatives for complete change of electrical equipment across the country but there is a need for changing the way of operation and control of the electrical equipment.

1.1.1 Accordingly, Government of India (GoI) has launched the Revamped Distribution Sector Scheme (RDSS) to help DISCOMs to improve their operational efficiencies and financial sustainability by providing result-linked financial assistance to DISCOMs to strengthen supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. Main objective of the scheme is Reduction of AT&C losses to pan-India levels of 12-15% by 2024-25 and Reduction of ACS-ARR gap to zero by 2024-25. Also, improvement in the quality, reliability and affordability of power supply to consumers through a financially sustainable and operationally efficient distribution sector.***For details a copy of MoP letter dated 20 July, 2021 is attached (hard and soft copy) herewith as Annexure-A.***

1.2 Main components of RDSS Schemes are as follows:

1.2.1 Part A – Financial support for up gradation of the Distribution Infrastructure and Prepaid Smart Metering & System Metering.

Part B – Training & Capacity Building and other Enabling & Supporting Activities.

1.2.2 The current DPR is for "Implementation of Prepaid Smart Metering & System Metering" through AMI-SP on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis. The DPR preparation for "Upgradation of the Distribution Infrastructure" is in progress and same will be submitted to MERC separately for obtaining in principleapproval of the Hon'ble Commission

1.2.3 Vide MoP notification dated 17th August 2021, GoI prioritised for all DISCOMS including BEST that "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Prepayment Mode conforming to relevant IS, within the time".Pre-paid smartmetering and system metering are proposed to be implemented through Public Private Partnership (PPP)on OPEX basis.

1.2.4 For availing a grant of Rs. 900 or 15% of the cost per consumer (whichever is lower) under RDSS, for "Implementation of prepaid Smart Metering & System Metering" BEST have to meet pre-qualifying criteria and to achieve basic minimum benchmarks.Further to this, fast-track installation of prepaid Smart Meters by December 2023, an additional incentive of 7.5% of the cost per consumer meter or Rs. 450 (whichever is lower) shall be available to qualified states.

1.3 Introduction of BEST's Revamped Distribution Sector Scheme (RDSS) for AMI-SP:

BEST was submitted a copy of Action Plan & DPRs vide Letter Ref. No. GM/AGMES/18668/2022 dated 22.08.2022 for Loss Reduction works for Rs.2321 Crs, Modernisation & System Augmentation works for Rs. 430.63 Crs and Metering works for

Rs.708.54 Crs and Capacity building & training for Rs. 0.81 Crs, totalling Rs. 3460.98 for availing benefits of the RDSS to improve the services of the consumers. Subsequently, vide Letter No. 02:10:RDSS:2021:I:BEST dated 21.11.2022, Executive Director, for Power Finance Corporation (PFC)has informed that Monitoring Committee for RDSS constituted under Chairmanship of Secretary (power), Govt. of India, in its 13th meeting held on 28.10.2022 has approved the Action Plan and Detailed Project Report (DPRs) for Loss Reduction works and prepaid smart metering works of BEST under RDSS Scheme. For prepaid Smart Metering, out of Rs.708.54 Crs Monitoring Committee has approved only Rs. 659.17 Crs for metering infrastructure and total GBS including incentive for phase –I Rs.146.69 Crs. ***A copy of BEST's Letter and approval from PFC is enclosed as Annexure – B and for detail guidelines of RDSS Schemes kindly refer Annexure-C (only soft copy submitted).***

1.4 Brief information about the tendering process takes place in BEST for awarding turnkey contract to appoint AMI-SP for Implementation of Prepaid Smart Metering under RDSS:

1.4.1 A material is procured as per CAPEX Regulation, 2022, APENDIX-3.

Brief information about the Tender: A tender was opened on 21.07.2022 for appointment of AMI-SP for "Implementation of Prepaid Smart Metering" through open biddingprocesson Maha e-tender Portal. BEST undertaking advertised the tender in the local as well as all over Indiamedia.Initially, Notice of Inviting Tender was advertised for "appointment of full turnkey contractor (AMI-SP) to execute the project under RDSS". Due to the poor response from the bidders, multiple extensions were given. Finally, tender was opened on 21st July, 2022. Afteropening of the tender, it is observed that six bidders have taken part in the bidding processand it has been observed that the rates quoted by the firms, particularly towards the execution ofPrepaid smart metering project.

1.4.2 Details of offers received for appointment of AMISP:

In tender document it has been clearly mentioned that the tender evaluation shall be done on the basis of Reverse Auction Process (RAP) between the Eligible and Qualified Tenderers to appoint AMI-SP for implementation of Smart metering Pre-payment system Project. In the said tender, six bidders have taken part. Accordingly, out of Six Tenderers, Pricebid of the three eligible Tenderers has been opened and same is given in the following table.

Bidder No.	Tenderers	Gross Rate Including GST tax. (in Rs.)	Rank
1	M/s. Fluent Grid Pvt Ltd	1559,99,75,299.00	3
2	M/s. Adani Transmission Ltd (ATL)	1528,26,00,331.34	2
3	M/S. Ashoka Buildcon Ltd.	1313,16,31,180.00	1 (LAO)

As per above, offer of the Bidder No. 3 was Lowest (LAO), however, in the reverse option method, bidder 2 has matched their rates with the LAO and further reducing the Cost by 10 Crore at price of Rs. 1303.16 Crore M/s. ATL succeed to get Order. This type of contract is being awarded for the first time in the BEST Undertaking.

Accordingly, for cost estimation purpose, the cost arrived through this tender is considered.

Sr. No.	Bidder No.	Basic Cost in Rs.	Total Tax 18%	Gross Cost in Rs.
1	2	11,04,37,55,237.00	1,98,78,75,942.89	13,03,16,31,179.89

A Letter of Award (LoA) has issued to ATL and soft copy of the same is enclosed as Annexure-D.

2. Challenges in the BEST Undertaking:

2.1 Performance of any Electric distribution utility is measured over following crucialParameters.

- Cost of supply including T&D loss
- Customer services
- Management of demand curve – supply reliability
- Electricity supply quality

2.2 In the current dynamic scenario where consumers are installing roof top solar systems,updated their vision and have added following vision statements:

- Active participation of consumers in managing load curve
- Integration of distributed generation, batteries etc.
- Faster information to consumers
- Self-healing system
- Optimum utilization of asset and resources

2.3 BEST distributes electricity in the island city of Mumbai. Its area of distribution lies fromSouth Mumbai to Sion in the East and to Mahim in the West. BEST distributes power to an area spread over about 69 sq.km and provides electric supply to more than10 Lakhs consumers connected to its distribution network, comprising residential, commercialand industrial consumers, depending on the purpose of use of electricity.

2.4 Presently, BEST is not having such type of AMI infrastructure. So, the BEST is facing issues like wrong manual reading, delay in detection of defective meters, amendmentsand related disputes.

2.5 The mission of BEST undertaking is to provide economical, reliable and quality electricitysupply to all consumers connected to its network. Though BEST's present network hasstatic and few electro-mechanical meters in the system. The key challenges are to ensure that:

- Data/ information are communicated back at desired frequency in desired formats
- All desired information/ data/ events are generated
- All data/ information is processed
- All data/ information is analyzed to meet company objectives and for routineoperations
- Smart actions are taken based on data/ information analytics
- Customer Inclusion is achieved
- Asset optimization and operational efficiency
- There is improvement in Power Quality

3 Objective of the Scheme

3.1 **Objective**: To adopt technological advancements in energy metering to achieve Reduction in loss, for accurate measurement of energy, to provide improved service to consumers, to release new supply and to replace electromechanical and static metersby smart meters.

The AMI-SP will make 100% upfront capital investment and will recover its investments on long term from the gains of the projects on **OPEX basis**.

3.2 Introduction to the smart meters:

(i) After replacement of electro-mechanical meters with static meters, transition from static meters to smart meters is one of the most important steps towards improving consumer metering. Smart meters are a key component of a power supply system and play a significant role in revenue protection, quality control, compliance with regulatory requirements, consumer satisfaction and image building. The present billing system has chances of error and it is also time consuming. In the existing meter system, consumers are presented with usage information only once a month with their bill.

(ii) The smart meter is very essential to collect precise and appropriate data in a timely manner which includes gathering of data, its communication and storage. The smart meter allows the bi-directional flow of information from consumer to utility and vice versa. The data communication in real time basis allows the utilities with advantages like real time pricing, outage detection, identification of power theft, avoids meter data tampering and provides better service. With the data received in timely manner utilities shall have a better opportunity to work better with increased stability.Efficient metering practices help to maintain the financial health of a utility. These include accurate billing and prevention of power theft, which have been the focus areas for utilities. These practices also help in lowering aggregate technical and commercial losses of the utilities.

(iii) Advance metering infrastructure (AMI), automated meter reading (AMR), pre-paid meters and net meters are the key technologies of smart metering being adopted. This will help in improving metering efficiency, billing accuracy, revenue management and consumer satisfaction.

In light of the above-mentioned possibilities, BEST has reviewed its present metering system and data collection system for implementation AMI / Smart Metering. The key equipment and infrastructure required for this purpose include:

- Smart meters for data generation
- Communication infrastructure RF mesh network/ cellular network or both
- HES (Head End System) for data acquisition and Network ManagementSystem(NMS)
- Other Accessories required to integrate AMI System
- Fieldoperationsapp
- Networkoperationsmonitoringcentre

3.3 Scope of the work:

PART-A

1. Supply, installation, integration, testing and commissioning of **Single phase** whole current Smart Meter with inbuilt NIC module – (Consumer Meter, inclusive of 10 Net meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M includingdata availability (Single Phase, Qty – 901212 Nos.).

2. Supply, installation, integration, testing and commissioning of **Three phase** LT-CT operated Smart Meter with inbuilt NIC module (with Net-Metering) – DT Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability(Three Phase, Qty – 168419 Nos.).

3. Supply, installation, integration, testing and commissioning of Three Phase HT current Smart Meter with inbuilt NIC module (Inclusive of 12 nos. Existing Solar/Net Meter Consumers) – Consumer Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 206 Nos.).

4. Supply, installation, integration, testing and commissioning of three phase LT-CT operatedSmart Meter with inbuilt NIC module (Inclusive of 97 nos. Existing Solar/Net Meter Consumers) – Consumer Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 6053 Nos.).

5. Supply, installation, integration, testing and commissioning of Three phase LT-CT operated Smart Meter with inbuilt NIC module (with Net-Metering) – DT Meter along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 3398 Nos.).

6. Supply, installation, integration, testing and commissioning of Three phase CT/PT operated Smart Meter with inbuilt NIC module – Feeder Meter (with suitable box & TTB arrangement for individual meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability (Three Phase, Qty – 1255 Nos.).

7. Supply, installation, integration, testing and commissioning of Three phase CT/PT operated Smart Meter with inbuilt NIC module (ABT Meters) (With Suitable box & TTB arrangement for individual meters) along with Communication Solution, HES hosted on cloud, procuring all the necessary licenses, setting up NOMC with suitable backend communication and infrastructure, integration of HES with Meter Data Management system of BEST and its O&M including data availability(Three Phase, Qty – 133 Nos.).

PART-B:

8. Supply and installation of Meter Boxes for DT check meters (Qty – 3398 Nos.).
9. Supply and installation of LTCTs of LT CT Meters (Set of 3 CTs) (Qty- 6053Nos.).
10. Supply and installation of LT CTs for DT metering (Ring Type) (Qty – 5610 Nos.).

PART-C-New requirement for software

11. Architecture, Security and Integration Specialists
12. Data Base Developer- Sr., Web/ Mobile Application Developer- Sr. andCore Application Developer- Sr.
13. Data Base Developer- Jr., Web/ Mobile Application Developer- Jr. and Core Application Developer- Jr.

A copy of detail scope of work is enclosed as Annexure-E.

3.4 Indicative list of meters to be replaced with Smart Meters

Sr. No.	Meter Type	Quantity(in Nos.)
1	Single Phase Meter-WC	901212
2	Three Phase Meter-WC	168419
3 #	Three Phase Meter-LTCT	6053
4	Three Phase Meter-LTCT DT Meter	3398
5	Three Phase Meter-HTMeters	206
6	Three Phase Meter –HT Feeder Meter	1255
7	Three Phase Meter-CT/PT Operated ABT Meter	133
	GRAND TOTAL	**10,80,676**

#- LTCT meters includes 97 Nos. existing Net Meters

3.5 Technical Feasibility of the Scheme:

3.5.1 **Statutory Requirement**:

As per Section 55(1) of Electricity Act 2003, it is mandatory to the Distribution Licensee to supply Electricity to the consumers after installation of Energy Meter for measurement of correct metering of the electricity supplied to the consumers. The Clause is reproduced as below:

"No Licensee shall supply electricity, after the expiry of two years from the appointed date, except through installation of a correct meter in accordance with the regulation to be made in this behalf by the authority."

3.5.2 As per MYT Regulation 75.7 *"A Distribution Licensee may undertake Opex schemes for system automation, new technology and IT implementation, etc., and, such expenses may be allowed over and above normative O&M Expenses, subject to prudence check by the Commission: Provided that the Distribution Licensee shall submit detailed justification, cost benefit analysis of such schemes as against capex schemes, and savings in O&M expenses, if any"*

3.5.3 Justification of the Capital Investment Scheme (Need of Investment):

Technical Justification:

(i) Every new connection is required to be released after installing a meter as per the Electricity Act, 2003. BEST has proposed installation of smart meters in this DPR during FY 2023-24, FY 2024-25& FY 2025-26.

(ii) As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulation. 2021 and Electricity (Rights of Consumers) Rules, 2020, all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading: further to that all the existing meters whenever replaced shall be replaced only by Smart Meter or Meter having at least the facility of remote reading.

(iii) The characteristics ofmeters to be procured for new connections will conform to the CEA(InstallationandOperationofMeters)Regulations,2006.

(iv) As per MoP, Notification dated 17thAugust, 2021 “all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Prepayment Mode conforming to relevant IS, within the time” Accordingly, BEST have decided to replace all existing Energy Meters with Smart Meters working with Prepayment Mode under RDSS Project. ***A copy of SoP Regulation, 2021 &MoP2021 Notification is enclosed as Annexure- ‘F’.***

(v) In line with the above technical requirements, BEST has prepared this Detailed Project Report (DPR) to replace static meters with smart meters for all consumers, along with setting up the backbone communications infrastructure and related IT systems. The communication backbone facilitates the acquisition of data from smart meters and brings it to central server. The IT/OT software installed in the server takes care of the huge data collected from the field. This data is then shared with other applications like billing, GIS, SCADA etc. and generated reports. Looking at the consumer base of more than 10 lakhs, BEST has planned to replace existing meters with smart meters.

4. Brief Description of the Pre-paid Smart Metering Project

4.1 Solution Architecture

Implementation of Smart metering technologies will enable two-way communication between the meter and the central system. Such an advanced metering infrastructure (AMI) differs from automatic meter reading (AMR) in that it enables two-way communication between the meter and the utility.

TheAMI/SmartMeteringsystemis explained below:

4.2 AdvancedMeteringInfrastructure(AMI):

This Advanced Metering Infrastructure (AMI) refers to technologies and communications systems necessary to acquire customer meter data and events on regular intervals (hourly or “n” hour basis) and allow for daily or more frequent retrieval of the data. Advanced metering can enhance a customer’s ability to reduce demand in response to a higher price and the utility’s ability to meter and monitor the customer electricity usage. Such metering system can also allow an electric utility to provide a variety of innovative services to benefit customers and to reduce the utility’s costs of operations.AMI communicates between utility control centre and consumer smart meters. BEST has initiated significant efforts to improve performance and energy efficiency in terms of AMI implementation initiative.

AMI or Smart Metering System establishes a mechanism for the residential, commercial and industrial customers, enabling energy audit to detect high loss, remote service disconnection /reconnection capability and consumer interactive interface.

It is a pivotal information source, which, when used effectively, can drive enterprise efficiencies and benefits throughout the distribution business, including:

Immediate Objectives	Long Term Objectives
• T&D Loss reduction ○ Theft detection	• Enabling value-added services
• Improved Collection ○ Pre-Paid and Post- Paid Options ○ Disconnection in case of non-payment	• Reduced capacity requirements &improved asset utilization • Increased service reliability
• Energy Audit ○ Online energy audit ○ Technical Loss analysis ○ Feeder Health report	• Enabling Demand Response (DR) & Smart Grid technologies
• Customer Satisfaction ○ Interactive Display ○ Auto power failure feed back ○ Consumption monitoring	• Improved load forecasting and modeling, system planning & engineering. • Improved transformer load management • Smart home control • DER Integration (a)

4.3 Overall System Architecture:

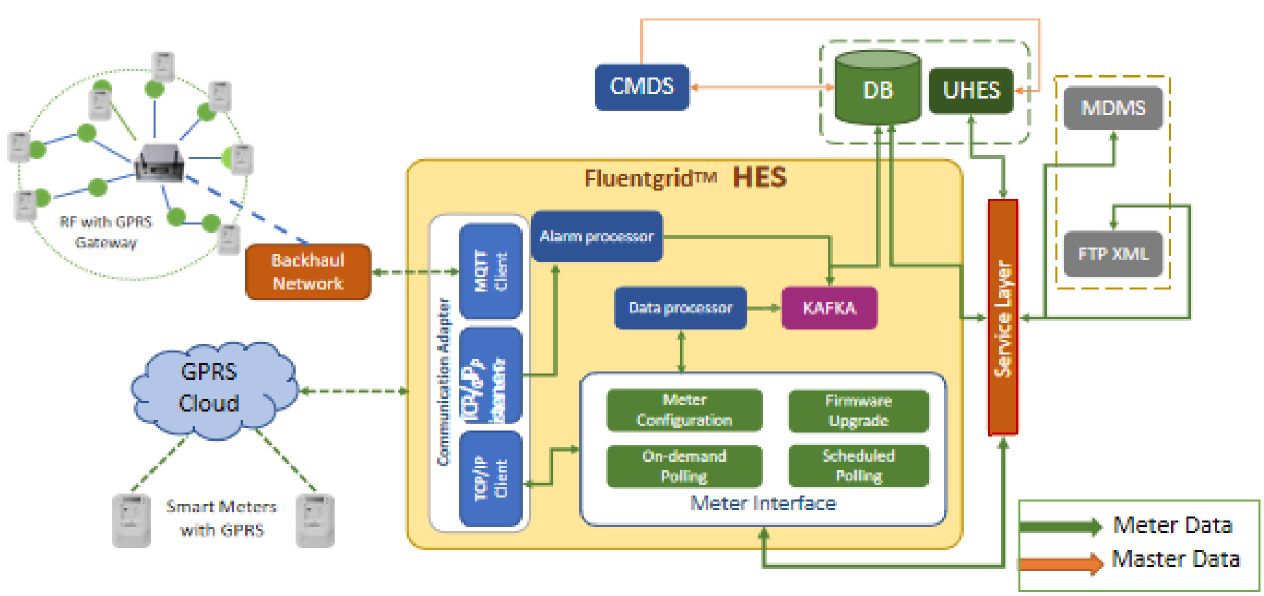

Fig-Solution Architecture (proposed and will be finalised during design phase)

4.4 BEST'sAMIProject:

- Supply, installation, integration, testing and commissioning of Smart pre-paid metering
- Communication Infrastructure to ensure the performance levels
- Head End System (HES) and deployment on Cloud
- AMI Systemintegration
- Network Operation cum Monitoring Centre with suitable backend communication infrastructure, hardware and power supply
- All the necessary software along with valid licenses relevant to the Project
- Consumer indexing on de-novo basis for contiguous electrical locations in the selected AMI area and regular updates during the contract period
- Comprehensive Consumer engagement plan in consultation with utility and implement its part of its activities as per the developed plan
- Operation, maintenance, and support services after the successful completion of the Operational Go-Live of the system

4.4.1 Proposed SmartMeteringSystemto be implemented by AMI-SP in BEST shall consist of followingkeycomponents:

I Smart Meters
II Communication Network
III Systems & Applications: Head End System (HES) and deployment on Cloud
IV AMI Integration (Para 4.2)

I. SMART METERS

Smart Meter is a composite unit consisting of metrology elements, two-way communication module(s) and control elements. It will have functions such as measurement, computation, event capturing, storing, communication and control. Smart Meter communication, it is envisaged that plug and play type communicationmodules shall be deployed in the smart meter, for any given communication technology. These modules shall be field-deployable, with corresponding communication interface modules being used in theDCU/Gateway or BTS of wide area network. The Network Interface Card (NIC) / Communication Module should be integrated with at least 3 (three) makes of meters in India to enable the respective meters to seamlessly integrate with proposed HES and/or MDM thus enabling interoperability of the system. At BEST, procurement of Smart Meters shall be as per the StandardIS16444, issued by BIS (Bureau of Indian Standards).

II. COMMUNICATION NETWORK

AMI-SP may use RF mesh network/ cellular network or a combination of both for collecting the date for smart meters. This Communication networkcomprises of a number of gateways. Network gateways shall be deployed across BESTs distribution area to provide RF coverage for end devices incorporating the communication nodes. This mesh network shall operate in unlicensed frequency band (865-867MHz). Communication network shall also provide reliable medium for two-way communication between various nodes (Smart Meter, Gateway/Router/Access Point/DCU (wherever applicable)) & HES. RF based network should use unlicensed frequency band as permitted by WPC. Meter data shall be routed /collected by field devices like Gateway /Router/Access Point, Data Concentrator Units (DCUs) wherever applicable given the communication technology used and transported to HES through WAN back haul connectivity.

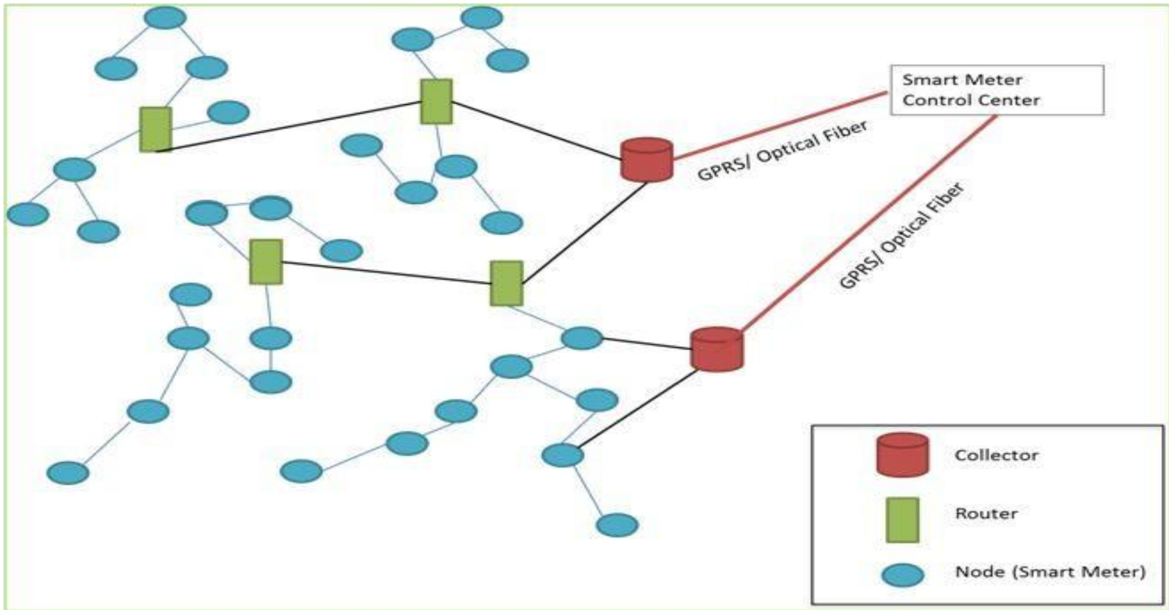

Fig. AMIMeshNetwork

The entire supplied communication infrastructure (Cellular based NIC or RF based devices (DCU /Router/access points wherever applicable) must have 4G with fallback to 2G connectivity. It should be upgradable to future communication technologies like 5G. AMI-SP shall confirm that the communication infra supplied should comply with as on date government, WPC, industry rules, standards, regulations and norms.

III. SystemsandApplications

a. HEAD ENDSYSTEM(HES) and DEPLOYMENT OF CLOUD

The main objective of HES is to acquire meter data automatically avoiding any human intervention and monitor parameters acquired from meters. HES shall exchange data with network terminals and field devices. It shall perform communication network management, field device management, device data management and processing of the data before exchanging to other systems (ERP, GIS, SCADA, and OMS etc).

HES should support various generations of cellular technologies and upcoming technologies like 5G and shall be responsible for autodiscovery of all Smart Meters once deployed in the field, the periodic collection of all meter data as well as the processing of all alarms and commands such as connect/disconnect for those meters.

HES should be able to do simultaneous communication with the entire supplied infrastructure (Cellularbased NIC or RF based devices (DCU/Router/access points wherever applicable) on RF mesh or 4G with fall back to 2G connectivity. It should support to future communication technologies like 5G. Supplied HES along with NMS should comply with the, as on date government, WPC, industry rule, standards, regulations and norms.

DEPLOYMENT CLOUD: -CLOUDSERVICEPROVIDERS(CSP)

For implementation of AMI / Smart Metering project, a cloud-based applications shall be used. The cloud data centre shall have to comply with requirements of tier III category which applies to a concurrently maintainable site infrastructure with redundant capacity components and multiple independent distribution paths serving the critical environment. All IT equipment shallbedual powered.

DATA CENTRE UNIT (DACU)

The Data Concentrator Unit is a gateway for communication of data between the Smart Meters and the HES. The Data Concentrator Unit receives information from the Smart Meter on a scheduled /need basis and passes it on to HES.

The DCU provides the central link between Smart Meters and HES, enabling continuous/periodic meter read and control. DCU shall exchange data from Smart Meters on RF communication and with HES on WAN.

b. NetworkManagementSystem(NMS)

The Network Management System (NMS) function within the HES shall manage, monitor and control the smart meters, RF Nodes, gateways and meshed communication network and its associated devices.This module shall provide real time information about the IP network and its associated NAN/WAN modules in the field device/s.

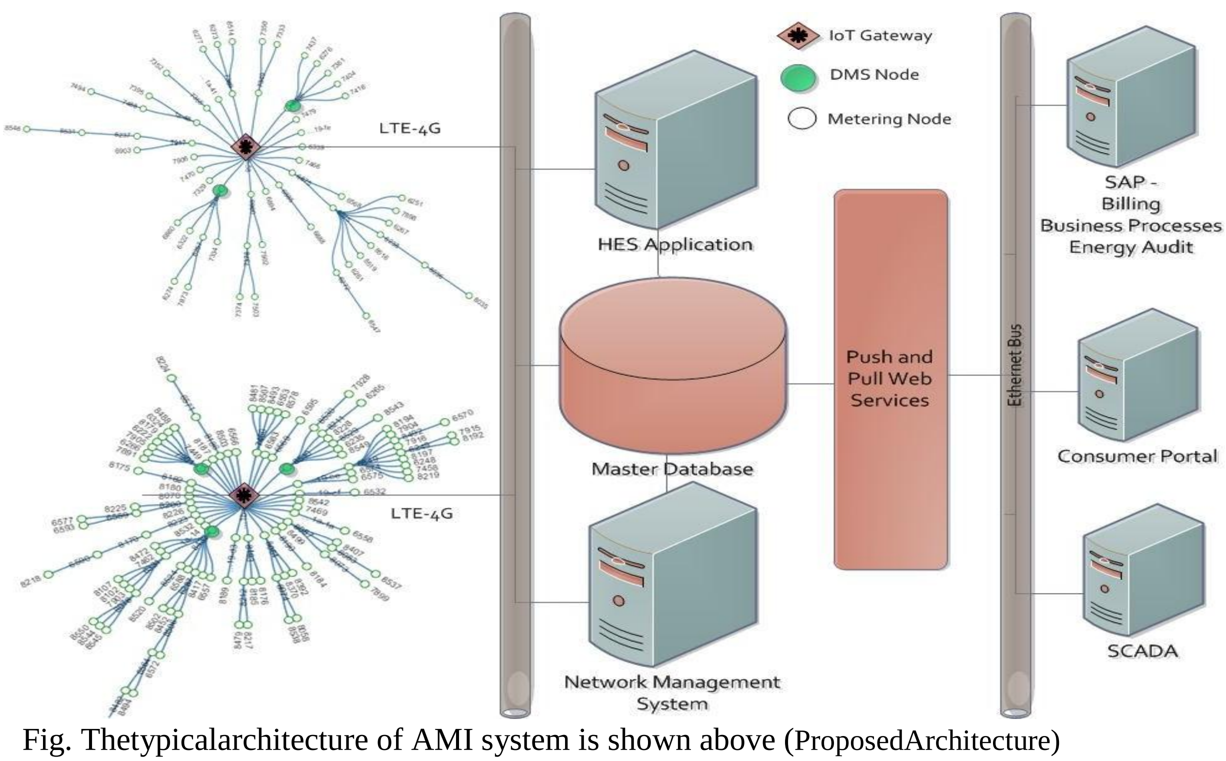

Fig. Thetypicalarchitecture of AMI system is shown above (ProposedArchitecture)

Master database should be HES database. The push and pull, SAP billing business processes Energy audit, SCADA, Consumer portal are shown only for information and are not covered under AMISP DPR

c. NETWORK COMMUNICATION

The network communications software shall use a standard network protocol such as TCP/IP, UDP etc. and shall support IPv6. The software shall link dis-similar hardware nodes such as local and remote work stations and peripheral devices into a common data communication network allowing communications among these devices. The network communication software shall include network security, security management, patch management and network services of the AMI system. Network communication software shall have scalability feature as envisaged.

d. OPERATING SYSTEM

The operating system of all the equipment of AMI application system including network equipment shall be latest version released upto six months prior to FAT. The operating system shall be hardened to provide robust security. The operating system and data file shall be placed in different disk partitions.

In order to facilitate cyber security requirement including patch management, common operating system is preferable to be used by all server nodes within the AMI application including MDM/HES servers. This is also to minimize the maintenance. All licenses for Operating System and other application software shall be supplied by the AMI-SP and shall bevalid throughout the contract period.

4.4.2 SYSTEM FEATUIRES

The following outcomes are expected once the smart metering system is implemented with the necessary software and integration:

- End to end solution for metering, load management, energy audit & MIS report generation
- Ease of maintenance of NW with real-time information
- Scalability to include LT consumers
    - Economical AMR solution (two-way communication)
    - Remote connect/ disconnect feature
    - Split metering to restrict tampering
    - On-line tamper detection and monitoring
- Customer Interface
    - Real time monitoring
    - Online profile
    - Payment and history maintenance
- Ease of monitoring & analysis as critical reports are formulated automatically

- No consumption in past 24 hours
- Energy imbalance for a group of meter
- Disconnected consumers
- Events/ Tamper report

- Automatic Meter Reading
  - Reliable Meter data
  - Prompt billing every month at fixed date
  - No intrusion at consumers premises
  - Can service customer’s request for billing data as-on-time
- Remote Connect/Disconnect
  - Can disconnect/reconnect customer have based on defaults
  - Can temporarily disconnect/reconnect based on requests
  - Can use auto-disconnect if load limit exceeds
  - Useful for regulating peak demand usage
  - Facility to switch to Pre-payment
- Online Event/Tamper Detection
  - Detects and reports any meter box opening
  - Detects and reports any bypass of meter
  - Reports zero consumption users daily
- Real Time Energy Audit
  - Check-meters provide real-time periodic consumption report
  - Gives a daily input regarding loss per transformer
  - Can corroborate daily all DT consumption report with energy input in a rea
- Intelligent Load Management
  - Load limiting per connection
  - Monthly consumption limit per connection
  - Intelligent cut-off on occurrence of High voltage than limit
  - Load switch option on to control Geysers / AC & such heavy loads etc
  - Transformer level load can be monitored to avoid over loading.

5. Costing of the project

5.1 The smart metering Project components:

(i) Smart Meters-Single Phase, Three Phase, LVCTO /DT meters, HT& ABT Meters,
(ii) Meter boxes and LT Ring Type CTs for DT metering, LT CT Banks
(iii) AMI Components (iv) O&M Charges (v) Interest on debt capital and (vi) RoE

5.2 Item wise costing

Item wise pert unit cost, Qty and total cost is given in the following table:

Sr. No.	Particulars	Unit Cost Gross (in ₹)	Qty (in Nos.)	Cost(in ₹)
1	Single Phase Smart meters with installation, communication & integration	11011.83	901212	9923993337.96
2	Poly Phase Smart meters with installation, communication & integration	16441.31	168419	2769028988.89
3	Poly Phase HT current Smart Meter Consumer Meter	40499.49	206	8342894.94
4	Three phase LT-CT operated Smart Meter (inclusive of 97 nos. existing Solar/Net Consumer Meters)	20249.63	6053	122571010.4
5	LVCTO Smart Meters installation, communication & integration	20249.63	3398	68808242.74
6	CTPTO Smart Meters installation, communication & integration	40499.49	1255	50826859.95
7	CTPTO Smart DT Meters installation, communication & integration	104141.49	133	13850818.17
	TOTAL PART-A	**-**		**12957422153.04**
8	Supply and installation of Meter Boxes for DT check meters	2012.37	3398	6838033.26
9	Supply and installation of LT Compact CTs of LT CT Meters (3 CTs)	2515.37	6053	15225534.61
10	Supply and installation of LT CTs for DT metering (Ring Type)	2515.37	5610	14111225.7
	TOTAL PART-B	**-**		**36174793.57**
11	Architecture Specialists	251552.40	12	3018628.80
12	Security Specialists	226394.46	12	2716733.52
13	Integration Specialists	226394.46	12	2716733.52
14	Data Base Developer- Sr.	176084.32	24	4226023.68
15	Web/ Mobile Application Developer- Sr.	176084.32	24	4226023.68
16	Core Application Developer- Sr.	201239.56	24	4829749.44
17	Data Base Developer- Jr.	150929.08	36	5433446.88
18	Web/ Mobile Application Developer- Jr.	150929.0836	36	5433447.01
19	Core Application Developer- Jr.	150929.08	36	5433446.88
	TOTAL-C	**-**		**38034233.41**
	GRAND TOTAL (A+B+C)			**13031631180.02**
	GRAND TOTAL			**1303.16 Crore**

Note: 18% GST is included in the unit rate.

5.3 Phasing of the Project

Sr. No.	Item Description	Gross Rate Per Unit	FY 2023-24		FY 2024-25		FY 2025-26		TOTAL	
1	2	3	4	5	6	7	8	9	12	13
PART-A	**Supply, Installation, Integration, testing**		**QTY**	**Amt**	**QTY**	**Amt.**	**Qty**	**Amt.**	**Qty**	**Amt.**
	and commissioning of-		**Nos.**	**In Cr**	**Nos.**	**In Cr**	**Nos.**	**In Cr**	**Nos.**	**In Cr**
1	Single Phase whole current	11011.83	140311	154.51	598751	659.33	162150	178.56	901212	992.40
2	Three Phase whole current	16441.31	168419	276.90	0	0		0	168419	276.90
3	Three Phase HT current	40499.49	206	0.83	0	0		0	206	0.83
4	Three phase LT-CT operated	20249.63	6053	12.26	0	0		0	6053	12.26
5	Three phase LT-CT operated	20249.63	3398	6.88	0	0		0	3398	6.88
6	Three phase CT/PT operated	40499.49	1255	5.08	0	0		0	1255	5.080
7	Three phase CT/PT operated	104141.49	133	1.39	0	0		0	133	1.390
PART-B-Installation of DT Meters & Accessories										
8	Meter Boxes for DT meters	2012.37	3398	0.68	0	0		0	3398	0.680
9	LT Compact CTs of LT CT Meters (Set of 3 CTs)	2515.37	6053	1.53	0	0		0	6053	1.530
10	LT CTs for DT metering (Ring Type)	2515.37	5610	1.41	0	0		0	5610	1.410
PART-C_ Specialist Man Power										
11	Architecture Specialists	251552.40	12	0.30	0	0	0	0	12	0.300
12	Security Specialists	226394.46	12	0.27	0	0	0	0	12	0.270
13	Integration Specialists	226394.46	12	0.27	0	0	0	0	12	0.270
14	Data Base Developer- Sr.	176084.32	12	0.21	12	0.21		0	24	0.420
15	Web/ Mobile Application Developer- Sr.	176084.32	12	0.21	12	0.21		0	24	0.420
16	Core Application Developer- Sr.	201239.56	12	0.245	12	0.245		0	24	0.490
17	Data Base Developer- Jr.	150929.08	12	0.185	12	0.18	12	0.18	36	0.547
18	Web/ Mobile Application Developer- Jr.	150929.08	12	0.180	12	0.18	12	0.18	36	0.543
19	Core Application Developer- Jr.	150929.08	12	0.180	12	0.18	12	0.18	36	0.543
			319775	**463.52**	**598751**	**660.54**	**162150**	**179.10**	**1080676**	**1303.16**

A copy of Cost Sheet is enclosed as Annexure-G

5.4 Funding Mechanism:

A per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilise internal funds for executing all its Capex plans. However, BEST has decided to execute the project of "Implementation of Smart Metering& System Metering" under RDSS on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis. The detail funding arrangement, how it works is explained in the Business Model.

5.5 TOTEX (CAPEX + OPEX) Business Model

5.5.1 (i) As per Regulation 75.7 *"A Distribution Licensee may undertake Opex schemes for system automation, new technology and IT implementation, etc., and, such expenses may be allowed over and above normative O&M Expenses, subject to prudence check by the Commission: Provided that the Distribution Licensee shall submit detailed justification, cost benefit analysis of such schemes as against capex schemes, and savings in O&M expenses, if any"*

(ii) In the "Office Memorandum" of GoI dated 20th July, 2021, it is clearly mention that*"in order to attain the key objective of loss reduction in electricity distribution, the scheme envisages providing funding through Gross Budgetary support for the installation of pre-paid Smart Meters under TOTEX (CAPEX plus OPEX) pattern".*

(iii) Accordingly, BEST has decided to execute the project of "Implementation of Smart Metering" under RDSS on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis. The scheme envisages providing funding through Gross Budgetary support for the installation of pre-paid Smart Meters under TOTEX (CAPEX plus OPEX) pattern". The project cost involves two major components: (i) Capital investment which involves cost of smart meters, meter boxes, Hardware & software, consumer indexing, training, installation, integration & commissioning of AMI solution etc. (ii) OPEX components which involves the cost for maintaining the system.

5.5.2 To execute the scheme under Revamped Distribution Sector Scheme (RDSS), BEST would have to comply (i) pre-qualification criteria set by the monitoring committee & (ii) result evaluation matrix. For availing the benefits under RDSS. BEST had submitted the Action plan &DPR for prepaid Smart Metring along with Loss Reduction works to the GoI costing Rs,708.54 Crs. however, the competent authority (Monitoring Committee) hasapproved the Action Plan & DPRs including prepaid Smart Meteringcosting Rs.659.17 Crs (against Rs.708.54 Crs), total GBS (15% on approved cost) Rs.98.88 Crs, incentive of Rs.47.82 Crs totalling Rs.146.69 Crs in the 13th meeting held on 28.10.2022 (kindly refer Annexure-B, Page No.10).

5.5.2.1 For achieving least cost of the material, BEST has followed up the procedure mentioned in CAPEX Regulation, 2022, APPENDIX-3(Guidelines for procurement of material). For appointing AMI-SP to "Implement Prepaid Smart Metering & System Metering" on BDFOOT basis, BEST advertised the tender in the local as well as all over Indiamedia.Initially, Notice of Inviting Tender was advertised for "appointment of

AMISP" under RDSS, but due to the poor response from bidders, multiple extensions were given to them. Finally, tender was opened for appointment of AMI-SP through open biddingprocesson Maha e-tender Portal on 21st July, 2022. After opening of the tender, it is observed that six bidders have taken part in the tender.However, thePricebid of only three eligible Tenderers has been opened. Tender evaluation is done on the basis of Reverse Auction process between the Eligible and Qualified Tenderers. Accordingly, the tender is awarded to M/s. ATL for Rs.1303.16 Crore.

5.5.3 In the OPEX base cost methodology, AMI-SP (ATL) has agreed to incur CAPEX during the build-up phase of 30 months and OPEX during Build-up and O&M phase i.e., total 120 months (10 years) from the date of execution of the contract. The payment due to the AMISP from AMI-IA shall be paid on monthly basis. Monthly cost is calculated as the total project cost spread over the actual recovery period, post integration of the meter. Accordingly, in this process BEST will pay to ATL on monthly basis for maximum 90 months. The payment to the AMISP shall commence only one after Operational Go-Live.

5.5.4 Considering the approved cost of Rs.659.17 Crs for replacement of 10,80,667 Nos. of meters, Competent Authority has approved GBSof Rs. 98.88 Crs, incentive of Rs.47.82 Crs, totalling Rs.146.69 Crs (as per RDSS Scheme GBS shall be 15% of the approved cost of metering including operational cost. Provided that it is not more than Rs.900 per meter for consumer metering). However, the cost arrived in the tender(i.e., 1303.16 Crs.) is on higher side than approved cost (Rs.659.17 Crs.).Therefore, as per RDSS guide lines BEST is eligible for getting GBS of Rs.98.88 Crs. for metering Scheme. While estimating the benefits, Grant amount of Rs.98.88 Crs. is deducted from the total payable amount of Rs.1303.16 Crs. Therefore, the benefits will be evaluated on balance payable amount of Rs. 1204.28 Crs. (Rs.1303.16 minus 98.88, = Rs.1204.28) is considered.***Please kindly note that incentive amount of Rs.47.82 Crs is not considered while calculating tariff impact and AMI-SP payments etc and same amount will be considered in ARR while filing the Petition for Truing up. BEST has proposed to install 10,80,676 Nos. of meters against approved10,80,667 Nos. of meters.***

5.5.5 While quoting in the tender, Adani Transmission Ltd (ATL) has not given bi-furcation between the costs of Capital items and O&M. ATL has quoted item wise for capital as well as O&M cost lum-sum. Further to this, ATL will transfer the assets at zero cost after completion of life of the meter as agreed by ATL. Thereafter, BEST will bear replacement cost of defective meters on actual basis and O&M cost of AMI system. **Payment to AMISP (M/s. ATL)by BEST shall be considered as Operational Expenditure on BEST's account.BEST has considered AMISP payment as operation expenditure while filing ARR and MTR petition.**The Assets will be in the books of Accounts of the ATL till the transfer of assets at the end of project at zero value.

5.5.6 Detail phasing of meters to be installed along with cost is to be incurred by AMISP during the build-up phase and Grant is given in the following table.

Sr. No.	Particulars	FY2023-24	FY2024-25	FY2025-26	Total
1	A	B	C	D	E=B+C+D
2	Approved cost	195.05	365.21	98.91	659.17
3	Meters to be Installed	3,19775	5,98,751	1,62,150	10,80,676
4	Total Cost (in Crs.)	463.52	660.54	179.10	1303.16
5	Grant	29.26	54.78	14.84	98.88
6	Balance Amount (4-5)	434.26	605.76	164.26	1204.28

Month wise implementation plan:

Month	FY	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15			**TOTAL**	FY-25-26		**TOTAL**
Target	**23-24**	1000	17429	18430	18430	44081	44081	44081	44081	44081	44081			**3.19.775**	M28	54049	**25-26**
Month		M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27		M29	54049	
Target	**24-25**	44081	44081	44081	44081	44084	54059	54059	54059	54059	54059	54059	54059	**5,98,751**	M30	54052	**1,62,150**

Detail calculation of phasing

	FY 23-24	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**	**FY 30-31**	**FY 31-32**	**TOTAL**
Build up phase Expenditure(in Crs.)	**463.52**	**660.54**	**179.10**	-	-	-	-	-	-	**1303.16**
Grant from GoI (PFC)	**29.26**	**54.78**	**14.84**	-						**98.88**
Phasing -AMISP Payment (without Grant)	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38	**1204.28**
Phasing -AMISP Payment (with Grant)	76.77	191.26	175.41	160.57	160.57	160.57	160.57	113.06	104.38	**1303.16**

FINANCIAL YEAR	**CAPEX**	**Grant**	**Month**	**CUMALATIVE QTY**	**RATIO**	**QTY**		**Phasing for AMISP disbursement**	**With Grant**
23-24	160.57	29.26	12	319775	0.296	319775		47.51	76.77
24-25	160.57	54.78	12	918526	0.850	598751		136.48	191.26
25-26	160.57	14.84	12	1082676	1.00	162150		160.57	175.41
26-27	**160.57**		12		1.000			**160.57**	160.57
27-28	**160.57**		12		1.000			**160.57**	160.57
28-29	**160.57**		12		1.000			**160.57**	160.57
29-30	**160.57**		12		1.000			**160.57**	160.57
30-31	**80.29**		6		1.000			**113.06**	113.06
31-32	**0.00**				1.000			104.38	104.38
32-33	0.00								
TOTAL	**1204.28**	**98-88**	**90**					**1204.28**	1303.16
	1204.28	**1303.16**		**1080676**		1080676			

5.5.7 Impact on Tariff – 100% CAPEX mode (with Grant)

Scheme Name	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30	FY 30-31	FY 31-32
Phasing of approved DPR	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
IDC	-	-	-	-	-	-	-	-	-
Total capitalisation (incl. IDC)	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
GFA statement									
Opening balance	-	47.51	183.99	344.56	505.13	665.70	826.27	986.84	1099.90
Addition	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
Closing balance	47.51	183.99	344.56	505.13	665.70	826.27	986.84	1099.90	1204.28
Equity statement									
Opening balance	-	14.25	55.20	103.37	151.54	199.71	247.88	296.05	329.97
Addition	14.25	40.94	48.17	48.17	48.17	48.17	48.17	33.92	31.31
Closing balance	14.25	55.20	103.37	151.54	199.71	247.88	296.05	329.97	361.28
Revenue expenses									
Interest on debt	1.68	8.06	17.92	27.81	26.34	25.32	24.30	21.60	20.28
Return on Equity (@17.50%)	1.10	6.08	13.87	22.30	30.73	39.16	47.59	54.78	60.48
Depreciation (Avg. rate of 9%)	2.14	10.42	23.78	38.24	52.69	67.14	81.59	93.90	103.69
Running Expenses (@2.97% of av GFA)	0.71	3.44	7.85	12.62	17.39	22.16	26.92	30.99	34.22
Income Tax (@ 0% on grossed up RoE)	-	-	-	-	-	-	-	-	-
Total (Rs. Cr)	**5.63**	**27.99**	**63.43**	**100.97**	**127.15**	**153.78**	**180.41**	**201.27**	**218.67**
Projected Sales (MU)	4,756.54	4,780.33	4,804.23	4,828.25	4,852.39	4876.65	4901.04	4925.54	4950.17
Imp. per unit of sales (Rs./unit)	0.012	0.059	0.132	0.209	0.262	0.315	0.368	0.409	0.442

The above table indicates the likely impact on tariff over a period of nine years (FY2023-24 up to FY 2031-32) when grant from GoI is considered. It can be observed that the likely impact on tariff is Rs.0.012 per unit in 2023-24 moving to Rs 0.442 per unit in 2031-32.

If the scheme is executed under OPEX, tariff impact with Grant for entire contract period is as shown below.

Total metering Scheme is considered under OPEX Plan, impact on Tariff is as shown below:												
DPR Description / DPR No.	**OPEX without Grant (Rs. Cr)**	**OPEX with Grant (Rs. Cr)**	**Grant (Rs. Crs)**	**FY 23-24**	**FY 24-25**	**FY 25-26**	**FY 26-27**	**FY 27-28**	**FY 28-29**	**FY 29-30**	**FY 30-31**	**FY 31-32**
Smart Metering / AMI (Rs. Crs)	1303.16	1204.28	98.88	47.51	136.48	160.57	160.57	160.57	160.57	160.57	113.06	104.38
Sales Units (in Mus)				4756.54	4780.33	4804.23	4828.25	4852.39	4876.65	4901.04	4925.54	4950.17
Impact on Tariff due to OPEX Scheme (in Rs.)				**0.100**	**0.286**	**0.334**	**0.333**	**0.331**	**0.329**	**0.328**	**0.23**	**0.211**

6. Cost Benefit Analysis (CBA)

The benefits of capital expenditure proposed to be incurred under this Scheme may be divided into two parts; namely- Tangible benefits which can be expressed in monetary terms and Intangible benefits are more qualitative in nature.

The expense heads under this scheme contain both developmental costs i.e., those cost incurred on pre-paid smart metering along with necessary Hardware & Software and non-developmental costs i.e., those cost incurred for maintenance of the system. Both expenses do not directly contribute to increase in the sale units. However, these expenses too are necessary for giving better service to the consumers through accurate energy measurement and billing to the consumers.

The deployment of smart metering with related infrastructure, through its ability of remote communication and data analytics, is expected tolead to many benefits for the end consumers which are listed in Para 6.1.1 under Customer Benefits. The reduction in O&M expenditure will be a step in the direction of meeting thenormative O&M expenditure as allowed from time to time in the respective tariff Orders /Regulations.

6.1 Tangible benefits due to smart metering /AMI Scheme:

The project aims to harness the capability of AMI/Smart Metering System for the benefit of BEST customers. Major benefits expected from this project are-

6.1.1 Customer Benefits

I. Improved billing accuracy

The smart meters are capable of communicating. This facility enables the system toget billing data on predefined intervals over the air. Hence the human interference iscompletely eliminated as far as meter data acquisition is concerned. Automatic data acquisition also eliminates the need to physically visit the premises to inspect the connection.

II Improved service restoration

At present consumers informs about off supply to control room of BEST. BEST deploys the crews depends on single consumer offsupply or area off supply in case of multiple complaints. Once the complete AMI system is in place, it is easier to pinpoint the location wherethe off supply / fault has occurred. Pro-active action canbe taken in cases where meter is not communicating, in such cases utility can take decision and send the maintenance staff to that particular location.

III Higher reliability of the system

The alerts triggered from field conditions such astemperature, high threshold values etc. enables the utility to take proactive actions. This reduces the probability of fault or breakdown occurrence.

IV Availability of information and online services

AMI enables two-way communication system in which lots of data and informationcan be captured from field devices like smart meters, distribution automation points,street light points, etc. The data retrieval frequency can also be set which can varyfrom as low as some minutes to daily. The consumer can view the consumptioncharges corresponding to his consumption, through consumer portal. BEST hasalready developed the consumer portal and is in the process of integrating it with the mobile App “MI BEST” and the website www.bestundertaking.com. Consumers can view their consumption charges at any time by logging on to thewebsite or by downloading the mobile App. Hence consumers can use and analysetheir consumption pattern and find ways to optimize the same as to reduce their electricity charges.

6.1.2 Utility Benefits

I Elimination of manual meter reading

Timely meter reading and billing is always critical for any utility across the world. Lot of intermediate processes are involved in metering like scheduling the meter reads, maintaining the reading cycle and sequence, uploading the batch files in the CMRI, physical movement, meter downloading, uploading the data into the PC and then to servers, running the logics to identify the billing data abnormalities, bill preparation etc. Many of these intermediate steps will be eliminated by automatic meter data downloading.

II Improved billing and billing accuracy

Less human intervention means reduced possibility of errors. Automatic data retrieval will ensure more accurate bills. The system also enables to get on demandmeter reading. Issues like in accessibility of meter reads like consumer not available, house lock, delayed billing cycle etc. can also be addressed. Thus, the revenue leakage and non-billing issues are arrested.

III Outage management and real time data

As mentioned in the reliability section above, it is easier to identify the faults and locate the mona GIS map. Outages can be located quickly and concerned maintenance staff can reach the location in lesser time. This also helps the utility to optimally manage the distribution network. Predefined threshold values and real time data sensor data enables to take quick and proactive decisions.

IV Work and asset management

Online availability of data enables to monitor the network real-time. Asset conditions and health can be monitored on line and records are easy to maintain and retrieve. Any work created or generated can be transferred to concerned staff on the Tab or smart phone. This reduces time in registering a request and its allocation. Once the job is complete, the feedback and status update can easily be entered from the field itself.

V. Smart meters will enable BEST to remotely connect or disconnect consumers, thereby reducing the field visits required by connection or disconnection personnel. Smart Meters Deployment Strategy.

VI. In the existing billing system, about 3% meters are not read due to various reasons like meters faulty, key not available etc. The revenue can be increased by installing smart meters which can be read remotely.

VII. Billing data is to be made available by AMI-SP during the entire project period. Hence, the cost to be incurred on the meter readers will be eliminated. It will help to reduce the administrative cost.

APPENDIX-1:

1. Part1:

1.1.	**Name of Applicant**: BEST (Brihanmumbai Electric Supply & Transport undertaking)
1.2.	**Name of the Capital Investment Work**: Implementation of Prepaid Smart Metering Project under RDSS.
1.3.	**Nature of Opex Scheme (New):** New DPR Scheme on "Implementation of Prepaid Smart Metering" is submitted as per MERC (Approval of Capital Investment Schemes) Regulations, 2022.
1.4.	**Details of the Location**: Mumbai circle (BEST's Licensee Area)
1.6.	**Date of Approval by Competent Authority designated by the Board of Directors of the Company**: *A copy of management approval for RDSS Scheme including "Implementation of Prepaid Smart Metering" is enclosed as* ***Annexure-H.***
1.7.	**Category of DPR**: This DPR Scheme falls under Regulation 3.9 & 3.11of MERC (Approval of Capital Investment Schemes)Regulations,2022. Category are as follows: 3.9 (a) Infrastructure required for releasing new supply connections. (i) Improvement in quality of supply & reliability of distribution system. (l) Installation or Upgradation of communication and/or control equipments. (n) All metering Schemes (o) Improvement in consumer services. 3.11Implementation of Smart Meters.
1.8.	**Objective of the Capital Investment:** To adopt technological advancements in energy metering to achieve Reduction in loss, for accurate measurement of energy, to provide improved service to consumers, Improved billing and billing accuracy, Higher reliability of the system, availability of information and online services, Outage management and real time data, Work and asset management,to release new supply and to replace existing meters. The project aims to harness the capability of AMI / Smart Metering system for the benefit of BEST customers. Major benefits expected from this project are improved service restoration.
1.9.	**Need of Analysis**: As per CEA Regulations dated 17.03.2006, on Metering systems emphasising on the need to use Smart Meters. ***A Copy of CEA Regulations, dated 17.03.2006 is enclosed as Annexure-'I'.*** As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulations, 2021 (Regulation No. 15), *"all the new connections shall be released with the Smart Meter having at least the facility of remote reading and all the existing meters whenever replaced shall be replaced only by Smart Meters having at least the facility of remote reading".* As per Ministry of Power, Notification dated 17thAugust, 2021 *"all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Pre-payment Mode conforming to relevant IS, within the time".* ***A Copy of MERC (ESC &SoP including Power Quality) Regulations, 2021 and MoP Notification, 2021 is enclosed as Annexure-'F'.***
1.10	**List of Identical schemes previously approved by the Commission and their progress report (5years data):**First timeBEST has planned to replace all existing meters with Smart Meters. Hence, no previous records of Smart meters Implementation Schemes.
1.11.	**State Map showing Location of the Scheme (for Transmission)**- Not Applicable
1.12.	**Brief scope and specification of work**: 1. Single Phase Meter-WC- Consumer Meter (Qty. 9,01,212 Nos.) 2. Three Phase Meter-WC- Consumer Meter (Qty. 1,68,419 Nos.) 3. Three Phase Meter-LTCT- Consumer Meter (Qty. 6,053 Nos.) 4. Three Phase Meter-LTCT-DT Meter(Qty. 3398 Nos.)

	5. Three Phase Meter- HT ConsumerMeters(Qty. 206 Nos.) 6. Three Phase Meter –HT Feeder Meter (Qty. 1255 Nos.) 7. Three Phase Meter-CT/PT Operated -ABT Meter (Qty. 133 Nos.) ***A copy of relevant Specification of above items is enclosed as Annexure-J***
1.13.	**Any Reference of Study Report / recommendation of OEM/Expert:** N.A for this DPR.
1.14.	**Estimated Cost**: Rs.1303.16 Crs. (FY 2023-24–463.52 Crs., FY 2024-25–660.54 Crsand FY 2025-26- 179.10 Crs) IDC is not included in the costing. ***A copy of Cost Sheet enclosed as Annexure-G.***
1.15.	**Time Frame of the expenditure:** Project completion Period 30 months.

Financial Year	Capex Expenditure (in Rs.)	Capitalisation (in Rs.)
2023-24	463,52,10,928.90	463,52,10,928.90
2024-25	660,54,18,569.61	660,54,18,569.61
2025-26	179,10,01,681.38	179,10,01,681.38
TOTAL	**1303,16,31,179.89**	**1303,16,31,179.89**

1.16. **Funding arrangement: For FY2023-24toFY 2031-32 (for 9 years from the date of contract).**

Sources of Funds	**Amount (in Crs.)**	**Share (%)**
Debt	1204.28	92.41
Equity	-	-
Grant	98.88	7.59
Consumer Contribution/Deposit Works	-	-
Total	**1303.16**	**100**

Please kindly note that the project of Smart Metering is to be executed under RDSS on DBFOOT basis. The payment due to the AMISP from AMI-IA (BEST)shall be paid on monthly basis. Monthly cost is calculated as the total project spread over the actual recovery period, post integration of the meter. Accordingly, BEST will pay AMI-SP on monthly basis for period of maximum 90 months. The payment to the AMISP commence from only one after Operational Go-Live. The Grant is 7.59% of tender cost and 15% of PFC approved cost of Rs.659.17 Crs.

1.17 **Benefits/Impact**:

The decision of new connection and replacement of existing meters with Smart Meters is taken with the following objectives:

- By connecting new meters to release new load will increase revenue of BEST.
- Improved billing Accuracy.
- Improved Service restoration.
- Higher reliability of the system.
- Availability of information and online services.
- Elimination of manual meter reading.
- Improved Billing and Billing Accuracy.
- Outage Management and real time data.
- Work and Asset Management.
- Remotely Connect and Dis-connect the meters

For comparative purpose, impact on tariff by considering 100% CAPEX Scheme and 100% OPEX Scheme is given below:

F Y	23-24	24-25	25-26	26-27	27-28	28-29	29-31	30-31	31-32
#	0.012	0.059	0.132	0.209	0.262	0.315	0.368	0.409	0.442
&	0.100	0.286	0.334	0.333	0.331	0.329	0.328	0.23	0.211

#- 100% CAPEX Scheme -Impact on Tariff Rs. Per Unit $-100% OPEX Scheme -Impact on Tariff Rs. Per Unit

1.18.	**Overall Cost-benefit Analysis**: **For CAPEX Scheme** FY2023-24, tariff impact will be 0.012 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.059 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.132 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.209 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.262 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.315 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.368 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.409 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.442 against Opex Cost of ₹104.38 Crs. . **ForOPEX Scheme** FY2023-24, tariff impact will be 0.100 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.286 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.334 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.333 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.331 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.329 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.328 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.230 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.211 against Opex Cost of ₹104.38 Crs. Comparison of capital cost & corresponding tariff impact with above benefits, a copy of Cost Benefit Analysis is enclosed as ***Annexure-K***.

2. PART-II:

2.1	**Need of the investment**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' need the efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas to concentrate by governments for the development of country. As per CEA Regulations dated 17.03.2006, on Metering systems emphasising on the need to use Smart meters. ***A Copy of CEA Regulations, dated 17.03.2006 is enclosed as Annexure-'H'.*** ***Vide*** MoP notification dated 17th August, 2021, GoI prioritised for all DISCOMS including BEST that "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Prepayment Mode***. A Copy of MERC (Electric Supply Code & SoP including Power Quality) Regulations, 2021 and MoP Notification, 2021 is enclosed as Annexure-'F'.*** **Demand side requirement**: There is addition of new consumers due to development of Coastal Road, Mill and SRA Schemes, EV Charging, Sewree bridge, Redevelopment of Plots etc. In order to meet the requirement of new Consumers for releasing new Load, Smart Meters are required installed. • Reduction in loss, • for accurate measurement of energy, • to provide improved service to the consumers, • to release new supply, • to replace conventional/Static meters, • to replace defective meters
2.2	**Time lines of the Project:** Project shall be completed within Period 30 months from the date of contract. Adani Transmission Ltd (ATL) has agreed to incur Capital Expenditure (CAPEX) during the build-up phase of 30 months from the date of contract and OPEX during O&M phase for remaining 90 months i.e., total 120 months.The work will be commenced from the date of the contract period . Letter of Award (LoA) is issued to M/s. ATL. For execution of project contract with ATL is being initiated. **On the following basis priority is decided**: As per "MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulations, 2021 (Regulation No. 15)", all the new connections shall be released with the Smart Meter having at least the facility of remote reading and all the existing meters whenever replaced shall be replaced only by Smart Meters having at least the facility of remote reading. As per Ministry of Power, Notification dated 17th August, 2021 "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with smart meters working in Pre-payment Mode conforming to relevant IS, within the time". ***A Copy of MERC (ESC & SoP including Power Quality) Regulations, 2021 and MoP Notification, 2021 is enclosed as Annexure-'F'.*** There is no possibility of deferring the investment. In 1st phase (1st Year) HT, CT-PT operated, LT-CT operated (including feeder meters) meters are taken for replacement and balance meters will be replaced in 2nd phase (2nd year).

2.3	**Scheme for revised approval/scope/cost**: This Scheme is New One and is submitted as per MERC (Approval of Capital Investment Schemes), Regulations 2022.
2.4	**Proposed Capital Investment Scheme**: In this DPR, capital investment is proposed to be executed as per MERC (Approval of Capital Investment Schemes) Regulations 2022, Clause No. 3.11 under TOTEX (Capex +Opex) Model. BEST has proposed to execute the said scheme under OPEX Mode.
2.5	**Technical Justification**: As per Electricity Act 2003, every new connection is required to be released after installing a correct meter for accurate Energy measurement. The Characteristics of the Energy Meters to be procured for new connections will conform relevant IS and Central Electricity Authority Regulations, 2006. ***A Copy of CEA Regulations, dated 17.03.2006 is enclosed as Annexure-'I'.*** (i)Every new connection is required to be released after installing a meter as per the Electricity Act, 2003. BEST has proposed installation of smart meters in this DPR during FY 23-24, FY 2024-25& FY 2025-26. (ii) As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulation. 2021 and Electricity (Rights of Consumers) Rules, 2020, all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading: further to that all the existing meters whenever replaced shall be replaced only by Smart Meter or Meter having at least the facility of remote reading. (iii)The characteristics of meters to be procured for new connections will confirm to the Central Electricity Authority (Installation and Operation of Meters)Regulation,2006. (iv) As per MoP, Notification dated 17th August, 2021 "all the consumers (other than agricultural consumers) in areas with communication network, shall be supplied electricity with Smart meters working in Prepayment Mode conforming to relevant IS, within the time" Accordingly, BEST have decided to replace all existing Energy Meters with Smart Meters working with Prepayment Mode. ***A copy of MERC (Electric Supply Code and SoP) Regulation, 2021 &MoP2021 Notification is enclosed as Annexure- 'F'.*** In line with the above technical requirements, BEST has prepared this Detailed Project Report (DPR) to replace existing Static and conventional meters with Smart meters for all consumers, along with setting up the backbone communications infrastructure and related IT systems. The communication backbone facilitates the acquisition of data from smart meters and brings it to central server. The IT/OT software installed in the server takes care of the huge data collected from the field. This data is then shared with other applications like billing, GIS, SCADA etc. and generated reports. Looking at the consumer base of more than 10 lakhs, BEST has planned to replace existing meters with smart meters.
2.6	**Financial Justification:** **TOTEX (CAPEX + OPEX) Business Model**

	(i) The scheme envisages providing funding through Gross Budgetary support for the installation of prepaid Smart Meters under TOTEX (CAPEX plus OPEX) pattern". The project cost involves two major components: (i) Capital investment which involves cost of smart meters, meter boxes, Hardware & software, installation, integration & commissioning of AMI solution, consumer indexing, training etc. (ii) OPEX components which involves the cost for maintaining the system. (ii) The complete scheme is to be executed under OPEX Mode. In the OPEX base cost methodology, Adani Transmission Ltd (ATL) has agreed to incur CAPEX during the build-up phase of 30 months from the date of contract and OPEX during O&M phase for balance period of 90 months i.e., total 120 months. The monthly cost is calculated as the total project cost spread over the actual recovery period, post integration of the meter. Accordingly, in this process BEST will pay to ATL on monthly basis for maximum 90 months. The payment to AMISP will start after the project goes live. (iii) While quoting in the tender, Adani Transmission Ltd (ATL) has not given bifurcation between the costs of Capital items and O&M. The Assets will be in the books of Accounts of the ATL till the transfer of assets at the end of project at zero value. • The new Smart Meters used for releasing new load will increase the revenue. • In accurate metering of energy consumption would lead to loss in revenue. By replacing faulty / conventional meters will reduce revenue losses resulting increase in revenue. • Replacement of all existing meters (Electronic/Conventional) with Smart Meters. Old assets (existing meters) will be scrapped.
2.7	**Consent of M-DNAC**: As per Electricity Act, 2003, Clause, 42(3), BEST undertaking being a local authority, hence exempted from open Access.
2.8	**Plan of other Transmission Licensees / CTU**: DPR is related to Distribution Licensees, hence Not Applicable.
2.9	**Phasing of Investment (The investment is done by ATL on DBFOOT basis)** : This capital expenditure and Capitalisation is shown for information purpose, otherwise the scheme is to be executed in OPEX Mode.
2.10	**Statutory/Safety Requirement: N.A**

Financial Year	Capex Expenditure (in Rs. Crore)	Capitalisation (in Rs. Crore)
2023-24	463.52	463.52
2024-25	660.54	660.54
2025-26	179.10	179.10
TOTAL	**1303.16**	**1303.16**

2.11 **Cost Assessment /Cost Break-up**:

Item wise costing

Item wise pert unit cost, Qty and total cost is given in the following table

Particulars	Unit Cost Gross (in ₹)	Qty (in Nos.)	Cost (in ₹)
Single Phase Smart meters with installation, communication & integration	11011.83	901212	9923993337.96
Poly Phase Smart meters with installation, communication & integration	16441.31	168419	2769028988.89
Poly Phase HT current Smart Meter Consumer Meter	40499.49	206	8342894.94
Three phase LT-CT operated Smart Meter (inclusive of 97 nos. existing Solar/Net Consumer Meters)	20249.63	6053	122571010.39
LVCTO Smart Meters installation, communication & integration	20249.63	3398	68808242.74
CTPTO Smart Meters installation, communication & integration	40499.49	1255	50826859.95
CTPTO Smart DT Meters installation, communication & integration	104141.49	133	13850818.17
TOTAL PART-A	**-**		**12957422153.04**
Supply and installation of Meter Boxes for DT check meters	2012.37	3398	6838033.26
Supply and installation of LT Compact CTs of LT CT Meters (3 CTs)	2515.37	6053	15225534.61
Supply and installation of LT CTs for DT metering (Ring Type)	2515.37	5610	14111225.70
TOTAL PART-B	**-**		**36174793.57**
Architecture Specialists	251552.40	12	3018628.80
Security Specialists	226394.46	12	2716733.52
Integration Specialists	226394.46	12	2716733.52
Data Base Developer- Sr.	176084.32	24	4226023.68
Web/ Mobile Application Developer- Sr.	176084.32	24	4226023.68
Core Application Developer- Sr.	201239.56	24	4829749.44
Data Base Developer- Jr.	150929.08	36	5433446.88
Web/ Mobile Application Developer- Jr.	150929.08	36	5433446.88
Core Application Developer- Jr.	150929.08	36	5433446.88
TOTAL-C	**-**		**38034233.28**
GRAND TOTAL (A+B+C)		**13031631179.89**	
GRAND TOTAL	**13031631179.89**		

Note: 18% GST is included in the unit rate.

As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022, BEST was invited and finalised tender to appoint AMI-SP for “Implementation of Prepaid Smart Metering Project” with a transparent, competitive, fair and reasonable procedure. Subsequently, ***a copy of a Letter of Award (LoA) has been issued to M/s ATL which is enclosed as Annexure-D.*** Accordingly, cost sheet is prepared by considering Unit rates for each item from issued LoA. For detail item wise calculation, a separate Excel Sheet is enclosed ***as Annexure-G.***

2.12 **Least Cost analysis /Alternatives**:

Proposal to "Implement Prepaid Smart Metering" ***A Letter of Award (LoA) has been issued to M/s ATL is enclosed as Annexure-A.***

1. As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations,2022 BEST was invited and finalised tender to appoint AMI-SP for "Implementation of Prepaid Smart Metering Project" with a transparent, competitive, fair and reasonable procedure.

2. Accordingly, the unit cost is derived from the open tender invited by advertising and following up the procure mentioned in Apendix-3. The order was placed on the technical suitable and LAO.

3. A tender was opened on 21.07.2022 for appointment of AMI-SP for "Implementation of Prepaid Smart Metering" through open bidding process on Maha e-tender Portal. BEST undertaking advertised the tender in the local as well as all over India media. Initially, Notice of Inviting Tender was advertised for "appointment of full turnkey contractor (AMI-SP) to execute the project. Due to the poor response from the bidders, multiple extensions were given. Finally, tender was opened on 21st July, 2022. After opening of the tender, it is observed that six bidders have taken part in the bidding process and it has been observed that the rates quoted by the firms, particularly towards the execution of Prepaid smart metering project.

4. Details of offers received for appointment of AMISP:

In tender document it has been clearly mentioned that the tender awarding shall be done on the basis of Reverse Auction Process (RAP) between the Eligible and

Qualified Tenderers to appoint AMI-SP for implementation of Smart metering Pre-payment system Project. In the said tender, six bidders have taken part. Out of Six Tenderers, Price bid of the three eligible Tenderers has been opened and same is given in the following table.

Bidder No.	Tenderers	Gross Rate Including GST tax. (inRs.)	Rank
1	M/s. Fluentgrid Pvt Ltd.	1559,99,75,299.00	3
2	M/s. Adani Transmission Ltd. (ATL)	1528,26,00,331.34	2
3	M/S. AshokaBuildcon Ltd.	1313,16,31,179.89	1 (LAO)

As per above, offer of the Bidder No. 3 was Lowest, however, in the reverse option, bidder 2 has matched their rates the LAO and further reducing the Cost by 10 Crore at price of Rs. 1303.16 Crore M/s. ATL succeed to won the Tender. This type of Tender/contract is being awarded for the first time in the BEST Undertaking.

Accordingly, for cost estimation purpose, the following cost arrived through this tender is considered.

(In Rs. Crs)

Sr. No.	Bidder No.	Basic Cost	Total Tax 18%	Gross Cost
1	2	11,04.37	1,98.78	13,03.16

A Letter of Award (LoA) has been issued to M/s ATL and copy of the same is enclosed as Annexure-D.

In view of above, least cost is achieved.

2.13	**If not and if Deferred Analysis**: For this case not applicable.
2.14	**Overall Cost-benefit Analysis**: Release of new load, improved billing accuracy, elimination of manual meter reading, consumer satisfaction etc. **For CAPEX Scheme** FY2023-24, tariff impact will be 0.012 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.059 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.132 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.209 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.262 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.315 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.368 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.409 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.442 against Opex Cost of ₹104.38 Crs. . **For OPEX Scheme** FY2023-24, tariff impact will be 0.100 against Opex Cost of ₹47.51 Crs. FY2024-25, tariff impact will be 0.286 against Opex Cost of ₹136.48 Crs. FY2025-26, tariff impact will be 0.334 against Opex Cost of ₹160.57 Crs. FY2026-27, tariff impact will be 0.333 against Opex Cost of ₹160.57 Crs. FY2027-28, tariff impact will be 0.331 against Opex Cost of ₹160.57 Crs. FY2028-29, tariff impact will be 0.329 against Opex Cost of ₹160.57 Crs. FY2029-30, tariff impact will be 0.328 against Opex Cost of ₹160.57 Crs. FY2030-31, tariff impact will be 0.230 against Opex Cost of ₹113.06 Crs. FY2031-32, tariff impact will be 0.211 against Opex Cost of ₹104.38 Crs. Comparison of capital cost & corresponding tariff impact with above benefits, a copy of Cost Benefit Analysis is enclosed as ***Annexure-K.***
2.15	**Methodology of Put to use of the asset and computing Percentage utilization of Project**: Following methodology of put to use of the Asset is used. 1. During the Financial Year (April to March), when the capital investment made on procurement of Energy Meters and his accessories is considered as Capital Expenditure made during that year. 2. When the meters are installed on site i.e. put to use, then the asset is capitalised.
2.16	**Constraints:** Performance of any Electric distribution utility is measured over following crucial Parameters. • Cost of supply including T&D loss • Customer services

	• Management of demand curve – supply reliability • Electricity supply quality In the current dynamic scenario where consumers are installing roof top solar systems, updated their vision and have added following vision statements: • Active participation of consumers in managing load curve • Integration of distributed generation, batteries etc. • Faster information to consumers • Self-healing system • Optimum utilization of asset and resources Presently, BEST is not having AMI infrastructure. The mission of BEST undertaking is to provide economical, reliable and quality electricity supply to all consumers connected to its network. Though BEST's present network has static and few Electro-mechanical meters in the system. The key challenges are to ensure that: • Data/ information are communicated back at desired frequency in desired formats • All desired information/ data/ events are generated • All data/ information is processed • All data/ information is analyzed to meet company objectives and for routine operations • Smart actions are taken based on data/ information analytics • Customer Inclusion is achieved • Asset optimization and operational efficiency • There is improvement in Power Quality
2.17	**Inclusion in STU Plan/License for Transmission Projects. Recommendation of the Transmission Planning Committee as provided in the Grid Code:** This is not applicable to this DPR.
2.18	**Works intended for adaptation of latest Technology/Improvement/Up gradation of Existing Infrastructure:** As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulation. 2021, Electricity (Rights of Consumers) Rules, 2020 and MoP Notification, it is made mandatory that all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading: further to that all the existing meters shall be replaced only by prepaid Smart Meter or Meter having at least the facility of remote reading. Accordingly, to implement above said regulations, BEST has prepared this Detailed Project Report (DPR) to release new connections with smart meters and also to replace all existing meters with smart meters for all consumers, along with setting up the backbone communications infrastructure and related IT systems. The communication backbone facilitates the acquisition of data from smart meters and brings it to central server. The IT/OT software installed in the server takes care of the huge data collected from the field. This data is then shared with other applications like billing, GIS, SCADA etc. and generated reports. Looking at the consumer base of more than 10 lakhs, BEST has planned to replace existing meters with smart meters.

2.19	**Upstream/Downstream arrangement:** For this DPR such arrangement is not applicable.
2.20	**Statutory Clearances and Project Layout: S**ince, smart meters are to be installed in the meter cabins which are constructed by the developer while constructing the building and in the existing meter cabins. Hence, there is no need of statutory clearances required from any other authority for this project.
2.21	**Detailed Survey**: For this project detail survey is not needed.
2.22	**Past Trend and Future projection**: First time, BEST has planned to replace all existing meters with Smart Meters by appointing AMI-SP,due to this past trend is N.A. **Future projection**: While awarding the tender to M/s ATL for implementation of Smart meter project, care is already taken.
2.23	**Detailed Justification for quantity proposed:** **Indicative list of meters to be replaced with Smart Meters**

Sr. No.	Meter Type	Quantity (in Nos.)
1	Single Phase *Smart Meter-WC	901212
2	Three Phase Smart Meter-WC	168419
3	Three Phase SmartMeter-LTCT	6053
4	Three Phase SmartMeter-LTCT DT Meter	3398
5	Three PhaseSmart Meter- HT Meters	206
6	Three Phase Smart Meter –HT Feeder Meter	1255
7	Three Phase Smart Meter-CT/PT Operated ABT Meter	133
	GRAND TOTAL	**10,80,676**

Please kindly note that smart meter quantity includes net meters.

(a) Justification for quantity proposed:

At present BEST having10,46,617 meters in the system, hence out of 10,80,676 meters 10,46,617 consumers meters, 133 ABT meters, 1255 feeder meters, 3398 DT meters and balance 29,273 meters for new connections are proposed.

2.24 **Check list of the documents appended:**

1. DPR in the MERC Format for FY2023-24 to FY2025-26 (Pg. No.1-24)
2. Pat-I and Part-II Filled Formats of Capital Investment Scheme for MERC Approval (Pg.No.25-36)
3. Annexure-A: - A Letter of MoP dated 20.07.2021 (Pg. No.37-56)
4. Annexure-B: -A copy of BEST's Letter & approval from PFC (Pg. No.57-87)
5. Annexure-C:- Guidelines if RDSS Scheme (Pg. No.88-143)
6. Annexure-D:- A Letter of ward of contract M/s ATL (Pg No. 144-162)
7. Annexure-E: - Detail scope of work. (Pg. No. 163-169)
8. Annexure-F:- MERC (ESC & SoP Regulation, 2021 and Mop Notification, 2021 (Pg. No.170-174)
9. Annexure-G: - Detail cost sheet (Pg. No 175-175)
10. Annexure-H:-A copy of Management Approval for RDSS (BCR) (Pg. No. 176-200)
11. Annexure -I:- A Copy of CEA Regulations, dated 17.03.2006.(Pg.No.201-203)
12. Annexure - J:-Specification of various items. (Pg. No. 204-355)
13. Annexure-K :- Cost benefit Analysis & Calculation Sheet (Pg.No.356-361)
14. Annexure-L:- Guidelines for procurement of materials (Pg. No.362-389)
15. Annexure-M:-Procedure for Scrapping (Pg. No .390-396)
16. .Annexure –N: -Depreciation Schedule (Pg. No. 397-400)

महाराष्ट्र विद्युत नियामक आयोग

Maharashtra Electricity Regulatory Commission

MERC/CAPEX/2023-24/0628 **Date: 22 November, 2023**

To,
The General Manager,
BEST Undertaking,
2nd Floor, Backbay Veej Bhavan
149/150, Gen J. Bhosale Marg,
Nariman Point, Mumbai 400 021.

Subject :-BEST DPR for Implementation of Smart Metering System for FY 2023-24 to FY 2024-25 Amounting to Rs 1303.16 Cr

Sir,

1. This has reference to your submitted DPR, for in principle approval to the Commission. The said scheme has been evaluated with reference to the Capex Regulations, 2022

2. I am directed to convey the 'in-principle' clearance of the scheme for the cost of Rs.1303.16 Crs under OPEX provisions of MERC (Approval of capital Invest Scheme) Regulations 2019. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.

3. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.

4. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.

१३वा मजला, केंद्र क्र. १, जागतिक व्यापार केंद्र, कफ परेड, मुंबई - ४०० ००५.
13th Floor, Centre No. 1, World Trade Centre, Cuffe Parade, Mumbai - 400 005.
Tel.: 022-2216 3964 / 2216 3965 / 2216 3969 **Fax :** 022-2216 3976
E-mail : mercindia@merc.gov.in **Website :** www.merc.gov.in

5. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

6. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

7. BEST shall endeavor to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within a period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

8. BEST to ensure that the income realization from scrap material shall be treated as per accounting principles.

9. BEST to submit the utilization report of credited equipment, if any, along with the six monthly report till all equipment's are reused.

10. Major scope of work shall be executed through competitive bidding process only.

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure A

<table>
<tr><td>Name of the scheme</td><td>BEST DPR for implementation of Smart Meters from FY 2023-24 to FY 2024-25</td></tr>
<tr><td>Estimated cost proposed by AEML-D (Revised)</td><td>Rs. 1303.16 Crore</td></tr>
<tr><td>In-principle approval accorded</td><td>Rs. 1303.16 Crore</td></tr>
<tr><td>Cost benefit</td><td>a) Release of new connections
b) Addnl. Revenue generation through new connections
c) Improvement in billing accuracy
d) Improved service restoration and higher reliability of supply
e) Outage management and real time data
f) Availability of information and online services
g) Improvement in quality of services
h) Reduction in manual meter reading and corresponding Opex</td></tr>
<tr><td>Scope of the works in brief</td><td>Installation of following meters along with hardware and software with O & M for 10 years
Single Phase Whole Current: -901212 Nos
Three Phase whole current: - 168419 Nos
Three Phase HT current: - 206 Nos
Three phase LT-CT operated: - 6053 Nos
Three phase LT-CT operated: - 3398 Nos
Three phase CT/PT operated: - 1255 Nos
Three phase CT/PT operated: - 133 Nos
Total: - 1080676 Meters</td></tr>
<tr><td>Objectives/Justification</td><td>a) Release of new connections
b) Addnl. Revenue generation through new connections
c) Improvement in billing accuracy
d) Improved service restoration and higher reliability of supply
e) Outage management and real time data
f) Availability of information and online services
g) Improvement in quality of services
h) Reduction in manual meter reading and corresponding Opex</td></tr>
<tr><td>Funding arrangement</td><td>Funding arrangement for execution of these schemes is 70:30 Debts: Equity, as per MYT Regulations and Grant from Central Government under RDSS.</td></tr>
<tr><td>Time frame/phasing out of expenditure</td><td>(Amount in Rs. Crs)
<table>
<tr><th>DPR Years</th><th>Total</th><th>FY 22-23</th><th>FY 23-24</th><th>FY 24-25</th></tr>
<tr><td>Capex</td><td>1303.16</td><td>463.52</td><td>660.54</td><td>179.10</td></tr>
<tr><td>Capitalization</td><td>1303.16</td><td>463.52</td><td>660.54</td><td>179.10</td></tr>
<tr><td>IDC</td><td></td><td>Nill</td><td></td><td></td></tr>
</table></td></tr>
</table>

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

Observations / Comments on Feasibility Report

1.	Prudence of Investment / Technical Justification	1. For release of new connections after installation of meters 2. For accurate meter reading of existing consumers
2.	Reasonability of Cost Estimate	BEST has carried out open tender process for allotment of the work contract and followed least cost option process
3.	Comments on Cost Benefit Analysis	i) Release of new connections ii) Addnl. Revenue generation through new connections iii) Accurate meter reading of existing consumers
4.	Discrepancy/Shortcomings Observed	Compiled by BEST
5.	Remarks/Specific Comments if any	Based on technical scrutiny and scope suggested by BEST, the scheme seems to be technically and commercially prudent.

Appendix A

Sr. No	Item Description	Gross Rate Per Unit	FY 2023-24		FY 2024-25		FY 2025-26		TOTAL	
1	2	3	6	7	8	9	10	11	12	13
PART-A	Supply, Installation, Integration, testing and commissioning of-		QTY	Amt.	Qty	Amt.	Qty	Amt.	Qty	Amt.
			Nos.	In Cr	Nos.	In Cr	Nos.	In Cr	Nos.	In Cr
1	Single Phase whole current	11011.83	140311	154.51	598751	659.33	162150	178.56	901212	992.40
2	Three Phase whole current	16441.31	168419	276.90		0		0	168419	276.9
3	Three Phase HT current	40499.49	206	0.83		0		0	206	0.83
4	Three phase LT-CT operated	20249.63	6053	12.26		0		0	6053	12.26
5	Three phase LT-CT operated	20249.63	3398	6.88		0		0	3398	6.88
6	Three phase CT/PT operated	40499.49	1255	5.08		0		0	1255	5.08
7	Three phase CT/PT operated	104141.49	133	1.39		0		0	133	1.39
	Total		319775		598751		162150		1080676	1295.7393
PART-B-Installation of DT Meters & Accessories										
8	Meter Boxes for DT meters	2012.37	3398	0.68		0		0	3398	0.68
9	LT Compact CTs of LT CT Meters (Set of 3	2515.37	6053	1.52		0		0	6053	1.52
10	LT CTs for DT metering (Ring Type)	2515.37	5610	1.41		0		0	5610	1.41
PART-C_ Specialist Man Power										3.61
11	Architecture Specialists	251552.4	12	0.30	0	0		0	12	0.3
12	Security Specialists	226394.46	12	0.27	0	0		0	12	0.27
13	Integration Specialists	226394.46	12	0.27	0	0		0	12	0.27
14	Data Base Developer- Sr.	176084.32	12	0.21	12	0.21		0	24	0.42
15	Web/ Mobile Application Developer- Sr.	176084.32	12	0.21	12	0.21		0	24	0.42
16	Core Application Developer- Sr.	201239.56	12	0.24	12	0.24		0	24	0.48
17	Data Base Developer- Jr.	150929.08	12	0.18	12	0.18	12	0.18	36	0.54
18	Web/ Mobile Application Developer- Jr.	150929.08	12	0.18	12	0.18	12	0.18	36	0.54
19	Core Application Developer- Jr.	150929.08	12	0.18	12	0.18	12	0.18	36	0.54
										3.78
	Total Cost in Crore			463.521		660.54		179.1		1303.16

महाराष्ट्र विद्युत नियामक आयोग
Maharashtra Electricity Regulatory Commission

MERC/CAPEX/2023-24/ 0023 **Date: 09 January, 2024**

To,
The General Manager,
BEST Undertaking,
2nd Floor, Backbay Veej Bhavan,
149/150, Gen J. Bhosale Marg,
Nariman Point, Mumbai 400 021.

Subject :-BEST DPR for Implementation of of various schemes under RDSS (Rs 1711.21 Crore)

Sir,

1. This has reference to your submitted DPR, for in principle approval to the Commission. The said scheme has been evaluated with reference to the Capex Regulations, 2022
2. I am directed to convey the 'in-principle' clearance of the scheme for the cost of Rs.1720.14 Crs under MERC (Approval of capital Invest Scheme) Regulations 2022. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.
3. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.
4. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.
5. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

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13th Floor, Centre No. 1, World Trade Centre, Cuffe Parade, Mumbai - 400 005.
Tel.: 022-2216 3964 / 2216 3965 / 2216 3969 **Fax :** 022-2216 3976
E-mail : mercindia@merc.gov.in **Website :** www.merc.gov.in

6. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

7. BEST shall endeavor to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within a period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

8. BEST to ensure that the income realization from scrap material shall be treated as per accounting principles.

9. BEST to submit the utilization report of credited equipment, if any, along with the six monthly report till all equipment's are reused.

10. Major scope of work shall be executed through competitive bidding process only.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure A

Name of the scheme	BEST DPR for Implementation of of various schemes under RDSS
Estimated cost proposed by BEST (Revised)	Rs. **1711.21**Crore
In-principle approval accorded	Rs. **1711.21** Crore
Cost benefit	a) Loss reduction b) Addnl. Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services
Scope of the works in brief	

Particulars	Additional	Replacement	Total
Power Transformers 33/11 KV in Nos	2	18	20
33 kV, 1500 MVA Primary Switchgears in Nos	1	17	18
11 kV,350 MVA Secondary Switchgears in Nos	1	31	32
33 KV Cable in KM	20	100	120
DSS 666 Nos		666	666
Replacement of SF6 RMUs		104	104
Replacement of Oil Filled RMUs by SF6 RMUs		95	95
Replacement of Oil Type switchgears by VCB		1726	1726
11 KV Cable in KM		200	200
LV Cable in KM		50	50
Meter Boards		74666	74666
ADMS for 870 DSS	1		1
ERP IT/ OT	1		1

Objectives/Justification	a) Loss reduction b) Additional Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services
Funding arrangement	Funding arrangement for execution of these schemes is 70:30 Debts: Equity, as per MYT Regulations and Grant from Central Government under RDSS.
Time frame/phasing out of expenditure	**(Amount in Rs. Crs)**

DPR Years	Total	FY 22-23	FY 23-24	FY 24-25
Capex	1711.21	429.73	736.94	544.54
Capitalization	1711.21	429.73	736.94	544.54
IDC		Nill		

Observations / Comments on Feasibility Report

1.	Prudence of Investment / Technical Justification	1. For loss reduction 2. For improvement in reliability
2.	Reasonability of Cost Estimate	BEST has carried out open tender process for allotment of the work contract and followed least cost option process
3.	Comments on Cost Benefit Analysis	a) Loss reduction b) Additional Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services
4.	Discrepancy/Shortcomings Observed	Compiled by BEST
5.	Remarks/Specific Comments if any	Based on technical scrutiny and scope suggested by BEST, the scheme seems to be technically and commercially prudent.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

Appendix A

RSS:-

Sr. No.	Name of Scheme	Cost in Cr.	FY 2023-24 QTY (in No.)	FY 2023-24 Cost (in Cr.)	FY 2024-25 QTY (in No.)	FY 2024-25 Cost (in Cr.)	FY 2025-26 QTY (in No.)	FY 2025-26 Cost (in Cr.)	Total QTY	Total Cost (in Cr.)
A	Installation of Additional 33/11 kV, 16 MVA T/F (1 No.) at Pratiksha Nara RSS and 33/11-6.6 kV, 16 MVA T/F at Naval Dock RSS (1 No.) (Qty-2)	7.16	1	2.84		4.32			2	7.16
B	**Replacement of Transformers:**								0	
B	Replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS viz. Mahalaxmi (2 Nos.), Sitaladevi (1 No.), Mazgaon Dock (2 Nos.), Sewree (2 Nos.), Kussara (1 No.), KEM Hosp (1 No.), Naval Dock (2 Nos.) Apollo (3 Nos.), Hutatma Chowk (3 No.) & Mahim (1 No.) (Qty-18 Nos.)	49.83	0		9	24.92	9	24.92	18	49.83
C.	Replacement of 33 kV, 1500 MVA Primary Switchgears viz. Mazgaon Dock (1 No.), Mumbadevi (2 Nos.), Mahim (2 Nos.), Masjid (1 No.), KEM Hospital (1 No.), Nair Hospital (1 No.), Kingsway (2 Nos.) Apollo (1 No.), Prabhadevi (2 Nos.), Nestle (1 No.), Ballard Estate (3 Nos.)& Colaba (1 No.) (Qty-18 Nos.)	4.65	5	1.29	7	1.81	6	1.55	18	4.65
D.	Replacement of 11 kV, 350 MVA Secondary Switchgears viz. Mahim causeway (2 Nos.), Grant Road (4 Nos.), Mahalaxmi (1 No.), Prabhadevi (2 Nos.), Kussara (2 Nos.), Apollo (2 Nos.), Dharavi (2 Nos.), Sewree (2 Nos.), Esplanade (3 Nos.), Mahim (2 Nos.), Wadala (2 Nos.), Malbar Hill (2 Nos.), KEM Hospital (1 No.), Worli (2 Nos.), Nair Hospital (1 No.) & Mahalaxmi (2 Nos.) (Qty-32 Nos.)	38.15	7	8.35	13	15.50	12	14.31	32	38.15
E.	Replacement / Laying of old /outlived 22/33 kV, 3CX300 SQ. MM Cu XLPE Cable (120 KM)	405.12	32.5	109.72	50	168.80	37.5	126.60		405.12
F	PMA Charges	3.05		0.68		1.32		1.05		3.05
	GRAND TOTAL	507.96		122.87		216.66		168.42		507.96
	MVA Added	MVA	16		70		18			
				122.87		216.66		168.42		507.96

DSS:-

Sr. No.	Name of Scheme	Cost in Cr.	FY 2023-24		FY 2024-25		FY 2025-26		Total QTY	Total Cost (in Cr.)
			QTY (in No.)	Cost (in Cr.)	QTY (in No.)	Cost (in Cr.)	QTY (in No.)	Cost (in Cr.)		
A	Replacement of DTs (Qty-666 Nos.)	**210.16**	200	63.11	233	73.52	233	73.52	666	**210.16**
B	Replacement of SF_6 RMUs (which are not caompatible for Distribution Automation) (Qty-104 Nos.)	**11.25**	30	3.25	34	3.68	40	4.33	104	**11.25**
C.	Replacement of Oil Filled RMUs by SF_6 RMUs caompatible for Distribution Automation) (Qty-95 Nos.)	**9.43**	29	2.88	36	3.57	30	2.98	95	**9.43**
D.	Replacement of Oil Type switchgears by VCB switchgears compaible for Distribution Automation) (Qty-396 Nos.)	**101.14**	76	19.41	160	40.86	160	40.86	396	**101.14**
E.	Replacement /Additional of 11 kV HV weak/old cable with 3CX240 SQ Mm XLPE cable (200 KM)	**268.35**	40	53.67	80	107.34	80	107.34	200	**268.35**
F	Replacement /Additional of 1.1 kV LV weak/old cable with 4CX300 SQ Mm XLPE cable (50 KM)	**90.61**	10	18.12	20	36.25	20	36.25	50	**90.61**
G	PMA Charges	**5.88**		1.36		2.26		2.26		**5.88**
	GRAND TOTAL	**696.81**		**161.80**		**267.48**		**267.54**		**696.81**

Auxiliary Components: -

DETAILS OF BREAK-UP OF TOTAL CONTRACTUAL VALUE OF INDIVIDUAL OFFER										
COST SHEET OF AUXILIARY COMPONENT ;S OF THE CONSUMER METERS										
Sr. No.	Description	Unit	Qty	Basic Rate Material	Basic Rate Labour	Gross Rate with GST	Item wise Total Cost in Rs.Cr	FY 2023-24	FY 2024-25	FY 2025-26
A	B	C	D	E	F	G =1.18*(E+F)	H =D*G			
1.01	Refurbishment of Meter Boards (1050 x 1050 X 19 mm i.e. 42"x 42") with facility to install 15 Nos. of Single Phase Meter, Wire and 63 Amps MCB.	Nos.	19190	8093.33	4034.36	14310.66	27.46			
2	Refurbishment of Meter Boards (1050 x 700 X 19 mm i.e. 42"x 28") with facility to install 4 Nos. of Three Phase Meter, Wire and 100 Amps MCB.	Nos.	26168	8749.32	3128.03	14015.28	36.68			
3	Refurbishment of 10 Way wooden Circuit Boxes for Hutment supply with facility to install 10 Nos. of Single Phase Meter, Wire and 40 Amps MCB.	Nos.	3140	15676.67	2386.80	21314.89	6.69			
4	Refurbishment of water Tight Aluminium Meter Box with Cover Type along with supply of and remaking of the cable gland.	Nos.	26168	2836.33	795.60	4285.68	11.22			
						Contractual Value	82.05	24.61	28.72	28.72
	PMA Charges						3.42	1.02	1.2	1.2
	Grand Total in Rs Cr						85.47	25.63	29.92	29.92

ADMS

SR. NO.	PARTICULARS	Gross Total with GST (in Rs Cr.)	FY 2023-24	FY 2024-25	FY 2025-26
1	SCADA/DMS Cnotrol Center : C1 - Servers / Workstation Hardware , Storage & Backup Devices, Switches, Data Centre Router, Security system (DMZ), Software for Control Centre (For Main & Standby Server) & Mandatory Spares	11.573			
2	SCADA/DHS DR Control Centre D1 - Server/ workstation Hardware, Storage & Backup Devices, Switches, Routers,	10.724			
3	RTUs, Software for LDMS, Test Equipments for RTU & Mandatory Additional Spares	11.303			
4	FRTUs, Test Equipments for FRTU & Mandatory Additional Spares	11.024			
5	MPLS, GPRS & Mandatory Additional Spares	10.478			
6	Main Equipments - Control centre, Main Equipments - DR Centre, For RTU/Data Concentrator/Communication Eqpts. FRTU, Remote VDU location & Mandatory Additional Spares.	4.289			
7	FPI, Control/power/Communication cable for RSS and DSS and mandatory Additional Spares	25.948			
8	IED Replacement & Mandatory Additional Spares	20.747			
9	Comprehensive Facility Management System	45.704			
10	Project Management Cost (Inclusive of GST)	30.358			
	Total	**182.15**	**87.37**	**53.65**	**41.13**
	PMA Charges	**1.89**	**0.9**	**0.56**	**0.43**
	Total In Rs Cr	**184.04**	**88.27**	**54.21**	**41.56**

ERP IT/OT

ERP, BILLING SOFTWARE AND IT/OT ENABLEMENT										
									Cost in Rs.Cr	
SR. NO.	PARTICULARS	UNIT	QTY	TOTAL	FY 2023-24		FY 2024-25		FY 2025-26	
				COST	QTY	Cost	QTY	Cost	QTY	Cost
1	Part IT System Implementation Phase Cost	No.	1	162.05	-	31.02600213	-	131.02		
2	IT System - ATS Cost (For 2 Years)	No.	1	26.46	-		-	13.23	-	13.23
3	Cloud Service Provider (CSP) Cost (For 2 Years)	No.	1	8.15	-		-	4.07	-	4.07
4	FMS services Cost (for 2 years)	No.	1	28.12	-		-	14.06	-	14.06
5	Operations & Maintenance (O&M) Services Cost (For 2 Years)	No.	1	11.16	-		-	5.58	-	5.58
	TOTAL			235.93		31.03		167.97		36.94
7	PMA Charges			1.00		0.13		0.71		0.16
	GRAND TOTAL in Rs Cr		-	236.93		31.16		168.68		37.10

Consolidated DPR

Sr No	Particulars	Total Capex in Rs Cr	FY 2023-24	FY 2024-25	FY 2025-26
1	RSS	504.91	122.19	215.34	167.37
2	DSS	690.93	160.44	265.22	265.28
3	Auxiliary Components	82.05	24.61	28.72	28.72
4	ADMS	182.15	87.37	53.65	41.13
5	ERP	235.93	31.03	167.96	36.94
6	PMA	15.24	4.09	6.05	5.1
	Total in Rs Cr	**1711.21**	**429.73**	**736.94**	**544.54**

महाराष्ट्र विद्युत नियामक आयोग
Maharashtra Electricity Regulatory Commission

MERC/CAPEX/2023-24/0023 Date: 09 January, 2024

To,
The General Manager,
BEST Undertaking,
2nd Floor, Backbay Veej Bhavan,
149/150, Gen J. Bhosale Marg,
Nariman Point, Mumbai 400 021.

Subject :-BEST DPR for Implementation of of various schemes under RDSS (Rs 1711.21 Crore)

Sir,

1. This has reference to your submitted DPR, for in principle approval to the Commission. The said scheme has been evaluated with reference to the Capex Regulations, 2022
2. I am directed to convey the 'in-principle' clearance of the scheme for the cost of Rs.1720.14 Crs under MERC (Approval of capital Invest Scheme) Regulations 2022. The particulars of the scheme as approved are outlined in the Annexure "A" and Appendix "A" attached.
3. Please note that this in-principle approval should not be construed as final approval for ARR purpose and the scheme will be open for scrutiny during the tariff determination process/ARR review, particularly in the context of actual cost incurred, scope and objective achieved etc., ex-post after implementation of the Scheme. BEST will be required to submit the status of implementation of the scheme with cost incurred till date, likely completion date, etc. along with its ARR Petition or during the tariff determination process at the appropriate time.
4. BEST should submit half yearly progress reports by 20th day of the first month of next half year giving the status of implementation of the Scheme in terms of expenditure incurred and item wise physical progress achieved during the implementation of the Scheme.
5. Assets created after execution of the Scheme should be maintained separately in the Asset Register.

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13th Floor, Centre No. 1, World Trade Centre, Cuffe Parade, Mumbai - 400 005.
Tel.: 022-2216 3964 / 2216 3965 / 2216 3969 **Fax :** 022-2216 3976
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6. Immediately after completion/commissioning of the scheme, BEST should communicate to the Commission the date of completion of the scheme, actual cost incurred, escalation in cost, if any, with reasons, the scope and objectives of the scheme and to what extent they have been achieved, etc., so as to facilitate a comparison between the benefits envisaged at the in-principle clearance and the actual benefits.

7. BEST shall endeavor to complete the project within the stipulated time frame. Further, if BEST fails to initiate the work, including tendering process if any, within a period of one year from the date of in-principle approval, the scheme shall be deemed to be cancelled. Thereafter, BEST will have to take a fresh look at the scheme and be required to obtain revised in-principle approval of the Commission with justification for delay.

8. BEST to ensure that the income realization from scrap material shall be treated as per accounting principles.

9. BEST to submit the utilization report of credited equipment, if any, along with the six monthly report till all equipment's are reused.

10. Major scope of work shall be executed through competitive bidding process only.

Yours faithfully,

(Dr. Rajendra G. Ambekar)
Executive Director, MERC

Encl: Annexure "A" and Appendix "A"

Annexure A

Name of the scheme	BEST DPR for Implementation of of various schemes under RDSS
Estimated cost proposed by BEST (Revised)	Rs. 1711.21Crore
In-principle approval accorded	Rs. 1711.21 Crore
Cost benefit	a) Loss reduction b) Addnl. Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services

Scope of the works in brief

Particulars	Additional	Replacement	Total
Power Transformers 33/11 KV in Nos	2	18	20
33 kV, 1500 MVA Primary Switchgears in Nos	1	17	18
11 kV,350 MVA Secondary Switchgears in Nos	1	31	32
33 KV Cable in KM	20	100	120
DSS 666 Nos		666	666
Replacement of SF6 RMUs		104	104
Replacement of Oil Filled RMUs by SF6 RMUs		95	95
Replacement of Oil Type switchgears by VCB		1726	1726
11 KV Cable in KM		200	200
LV Cable in KM		50	50
Meter Boards		74666	74666
ADMS for 870 DSS	1		1
ERP IT/ OT	1		1

<table>
<tr><td>Objectives/Justification</td><td>a) Loss reduction
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d) Improved service restoration and higher reliability of supply
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g) Improvement in quality of services</td></tr>
<tr><td>Funding arrangement</td><td>Funding arrangement for execution of these schemes is 70:30 Debts: Equity, as per MYT Regulations and Grant from Central Government under RDSS.</td></tr>
<tr><td>Time frame/phasing out of expenditure</td><td>(Amount in Rs. Crs)
<table>
<tr><th>DPR Years</th><th>Total</th><th>FY 22-23</th><th>FY 23-24</th><th>FY 24-25</th></tr>
<tr><td>Capex</td><td>1711.21</td><td>429.73</td><td>736.94</td><td>544.54</td></tr>
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<tr><td>IDC</td><td></td><td>Nill</td><td></td><td></td></tr>
</table></td></tr>
</table>

Observations / Comments on Feasibility Report

1.	Prudence of Investment / Technical Justification	1. For loss reduction 2. For improvement in reliability
2.	Reasonability of Cost Estimate	BEST has carried out open tender process for allotment of the work contract and followed least cost option process
3.	Comments on Cost Benefit Analysis	a) Loss reduction b) Additional Revenue generation c) Improvement in billing accuracy d) Improved service restoration and higher reliability of supply e) Outage management and real time data f) Availability of information and online services g) Improvement in quality of services
4.	Discrepancy/Shortcomings Observed	Compiled by BEST
5.	Remarks/Specific Comments if any	Based on technical scrutiny and scope suggested by BEST, the scheme seems to be technically and commercially prudent.

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION

Appendix A

RSS:-

Sr. No.	Name of Scheme	Cost in Cr.	FY 2023-24 QTY (in No.)	FY 2023-24 Cost (in Cr.)	FY 2024-25 QTY (in No.)	FY 2024-25 Cost (in Cr.)	FY 2025-26 QTY (in No.)	FY 2025-26 Cost (in Cr.)	Total QTY	Total Cost (in Cr.)
A	Installation of Additional 33/11 kV, 16 MVA T/F (1 No.) at Pratiksha Nara RSS and 33/11-6.6 kV, 16 MVA T/F at Naval Dock RSS (1 No.) (Qty-2)	7.16	1	2.84		4.32			2	7.16
B	**Replacement of Transformers:**								0	
B	Replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS viz. Mahalaxmi (2 Nos.), Sitaladevi (1 No.), Mazgaon Dock (2 Nos.), Sewree (2 Nos.), Kussara (1 No.), KEM Hosp (1 No.), Naval Dock (2 Nos.) Apollo (3 Nos.), Hutatma Chowk (3 No.) & Mahim (1 No.) (Qty-18 Nos.)	49.83	0		9	24.92	9	24.92	18	49.83
C.	Replacement of 33 kV, 1500 MVA Primary Switchgears viz. Mazgaon Dock (1 No.), Mumbadevi (2 Nos.), Mahim (2 Nos.), Masjid (1 No.), KEM Hospital (1 No.), Nair Hospital (1 No.), Kingsway (2 Nos.) Apollo (1 No.), Prabhadevi (2 Nos.), Nestle (1 No.), Ballard Estate (3 Nos.)& Colaba (1 No.) (Qty-18 Nos.)	4.65	5	1.29	7	1.81	6	1.55	18	4.65
D.	Replacement of 11 kV, 350 MVA Secondary Switchgears viz. Mahim causeway (2 Nos.), Grant Road (4 Nos.), Mahalaxmi (1 No.), Prabhadevi (2 Nos.), Kussara (2 Nos.), Apollo (2 Nos.), Dharavi (2 Nos.), Sewree (2 Nos.), Esplanade (3 Nos.), Mahim (2 Nos.), Wadala (2 Nos.), Malbar Hill (2 Nos.), KEM Hospital (1 No.), Worli (2 Nos.), Nair Hospital (1 No.) & Mahalaxmi (2 Nos.) (Qty-32 Nos.)	38.15	7	8.35	13	15.50	12	14.31	32	38.15
E	Replacement / Laying of old /outlived 22/33 kV, 3CX300 SQ. MM Cu XLPE Cable (120 KM)	405.12	32.5	109.72	50	168.80	37.5	126.60		405.12
F	PMA Charges	3.05		0.68		1.32		1.05		3.05
	GRAND TOTAL	507.96		122.87		216.66		168.42		507.96
	MVA Added	MVA	16		70		18			
				122.87		216.66		168.42		507.96

DSS:-

Sr. No.	Name of Scheme	Cost in Cr.	FY 2023-24 QTY (in No.)	FY 2023-24 Cost (in Cr.)	FY 2024-25 QTY (in No.)	FY 2024-25 Cost (in Cr.)	FY 2025-26 QTY (in No.)	FY 2025-26 Cost (in Cr.)	Total QTY	Total Cost (in Cr.)
A	Replacement of DTs (Qty-666 Nos.)	**210.16**	200	63.11	233	73.52	233	73.52	666	**210.16**
B	Replacement of SF_6 RMUs (which are not caompatible for Distribution Automation) (Qty-104 Nos.)	**11.25**	30	3.25	34	3.68	40	4.33	104	**11.25**
C.	Replacement of Oil Filled RMUs by SF_6 RMUs caompatible for Distribution Automation) (Qty-95 Nos.)	**9.43**	29	2.88	36	3.57	30	2.98	95	**9.43**
D.	Replacement of Oil Type switchgears by VCB switchgears compaible for Distribution Automation) (Qty-396 Nos.)	**101.14**	76	19.41	160	40.86	160	40.86	396	**101.14**
E.	Replacement /Additional of 11 kV HV weak/old cable with 3CX240 SQ Mm XLPE cable (200 KM)	**268.35**	40	53.67	80	107.34	80	107.34	200	**268.35**
F	Replacement /Additional of 1.1 kV LV weak/old cable with 4CX300 SQ Mm XLPE cable (50 KM)	**90.61**	10	18.12	20	36.25	20	36.25	50	**90.61**
G	PMA Charges	**5.88**		1.36		2.26		2.26		**5.88**
	GRAND TOTAL	**696.81**		**161.80**		**267.48**		**267.54**		**696.81**

Auxiliary Components: -

DETAILS OF BREAK-UP OF TOTAL CONTRACTUAL VALUE OF INDIVIDUAL OFFER										
COST SHEET OF AUXILIARY COMPONENT ;S OF THE CONSUMER METERS										
Sr. No.	Description	Unit	Qty	Basic Rate Material	Basic Rate Labour	Gross Rate with GST	Item wise Total Cost in Rs.Cr	FY 2023-24	FY 2024-25	FY 2025-26
A	B	C	D	E	F	G =1.18*(E+F)	H =D*G			
1.01	Refurbishment of Meter Boards (1050 x 1050 X 19 mm i.e. 42"x 42") with facility to install 15 Nos. of Single Phase Meter, Wire and 63 Amps MCB.	Nos.	19190	8093.33	4034.36	14310.66	27.46			
2	Refurbishment of Meter Boards (1050 x 700 X 19 mm i.e. 42"x 28") with facility to install 4 Nos. of Three Phase Meter, Wire and 100 Amps MCB.	Nos.	26168	8749.32	3128.03	14015.28	36.68			
3	Refurbishment of 10 Way wooden Circuit Boxes for Hutment supply with facility to install 10 Nos. of Single Phase Meter, Wire and 40 Amps MCB.	Nos.	3140	15676.67	2386.80	21314.89	6.69			
4	Refurbishment of water Tight Aluminium Meter Box with Cover Type along with supply of and remaking of the cable gland.	Nos.	26168	2836.33	795.60	4285.68	11.22			
						Contractual Value	82.05	24.61	28.72	28.72
	PMA Charges						3.42	1.02	1.2	1.2
	Grand Total in Rs Cr						85.47	25.63	29.92	29.92

ADMS

SR. NO.	PARTICULARS	Gross Total with GST (in Rs Cr.)	FY 2023-24	FY 2024-25	FY 2025-26
1	SCADA/DMS Cnotrol Center : C1 - Servers / Workstation Hardware , Storage & Backup Devices, Switches, Data Centre Router, Security system (DMZ), Software for Control Centre (For Main & Standby Server) & Mandatory Spares	11.573			
2	SCADA/DI IS DR Control Centre D1 - Server/ workstation Hardware, Storage & Backup Devices, Switches, Routers,	10.724			
3	RTUs, Software for LDMS, Test Equipments for RTU & Mandatory Additional Spares	11.303			
4	FRTUs, Test Equipments for FRTU & Mandatory Additional Spares	11.024			
5	MPLS, GPRS & Mandatory Additional Spares	10.478			
6	Main Equipments - Control centre, Main Equipments - DR Centre, For RTU/Data Concentrator/Communication Eqpts. FRTU, Remote VDU location & Mandatory Additional Spares.	4.289			
7	FPI, Control/power/Communication cable for RSS and DSS and mandatory Additional Spares	25.948			
8	IED Replacement & Mandatory Additional Spares	20.747			
9	Comprehensive Facility Management System	45.704			
10	Project Management Cost (Inclusive of GST)	30.358			
	Total	**182.15**	**87.37**	**53.65**	**41.13**
	PMA Charges	**1.89**	**0.9**	**0.56**	**0.43**
	Total In Rs Cr	**184.04**	**88.27**	**54.21**	**41.56**

ERP IT/OT

ERP, BILLING SOFTWARE AND IT/OT ENABLEMENT										
									Cost in Rs.Cr	
SR. NO.	PARTICULARS	UNIT	QTY	TOTAL COST	FY 2023-24 QTY	FY 2023-24 Cost	FY 2024-25 QTY	FY 2024-25 Cost	FY 2025-26 QTY	FY 2025-26 Cost
1	Part IT System Implementation Phase Cost	No.	1	162.05	-	31.02600213	-	131.02	-	
2	IT System - ATS Cost (For 2 Years)	No.	1	26.46	-		-	13.23	-	13.23
3	Cloud Service Provider (CSP) Cost (For 2 Years)	No.	1	8.15	-		-	4.07	-	4.07
4	FMS services Cost (for 2 years)	No.	1	28.12	-		-	14.06	-	14.06
5	Operations & Maintenance (O&M) Services Cost (For 2 Years)	No.	1	11.16	-		-	5.58	-	5.58
	TOTAL			235.93		31.03		167.97		36.94
7	PMA Charges			1.00		0.13		0.71		0.16
	GRAND TOTAL in Rs Cr		-	236.93		31.06		168.68		37.10

Consolidated DPR

Sr No	Particulars	Total Capex in Rs Cr	FY 2023-24	FY 2024-25	FY 2025-26
1	RSS	504.91	122.19	215.34	167.37
2	DSS	690.93	160.44	265.22	265.28
3	Auxiliary Components	82.05	24.61	28.72	28.72
4	ADMS	182.15	87.37	53.65	41.13
5	ERP	235.93	31.03	167.96	36.94
6	PMA	15.24	4.09	6.05	5.1
	Total in Rs Cr	**1711.21**	**429.73**	**736.94**	**544.54**

THE BRIHANMUMBAI ELECTRIC SUPPLY AND TRANSPORT UNDERTAKING

BEST SCHEME CODE NO:RDSS/BEST/FY2023-24/01(R)

SCHEMES TO BE EXECUTED UNDER RDSS (LOSS –REDUCTION)

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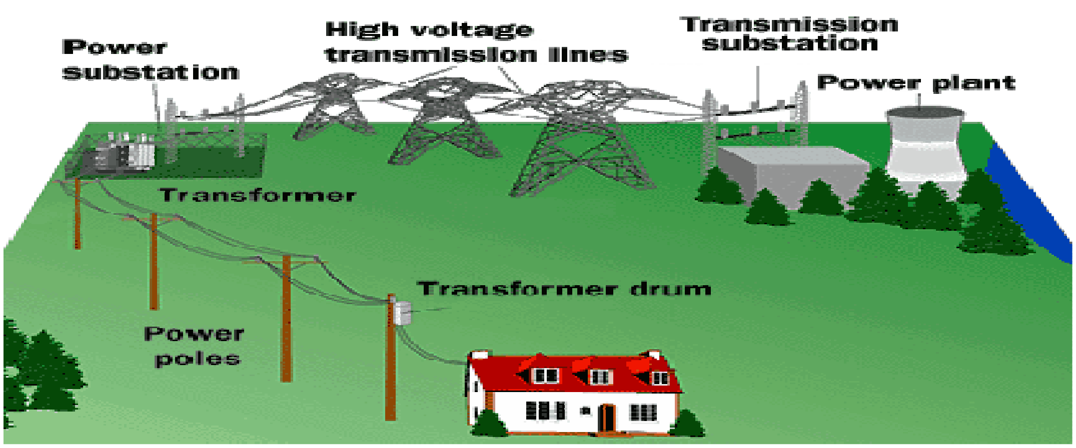


INDEX

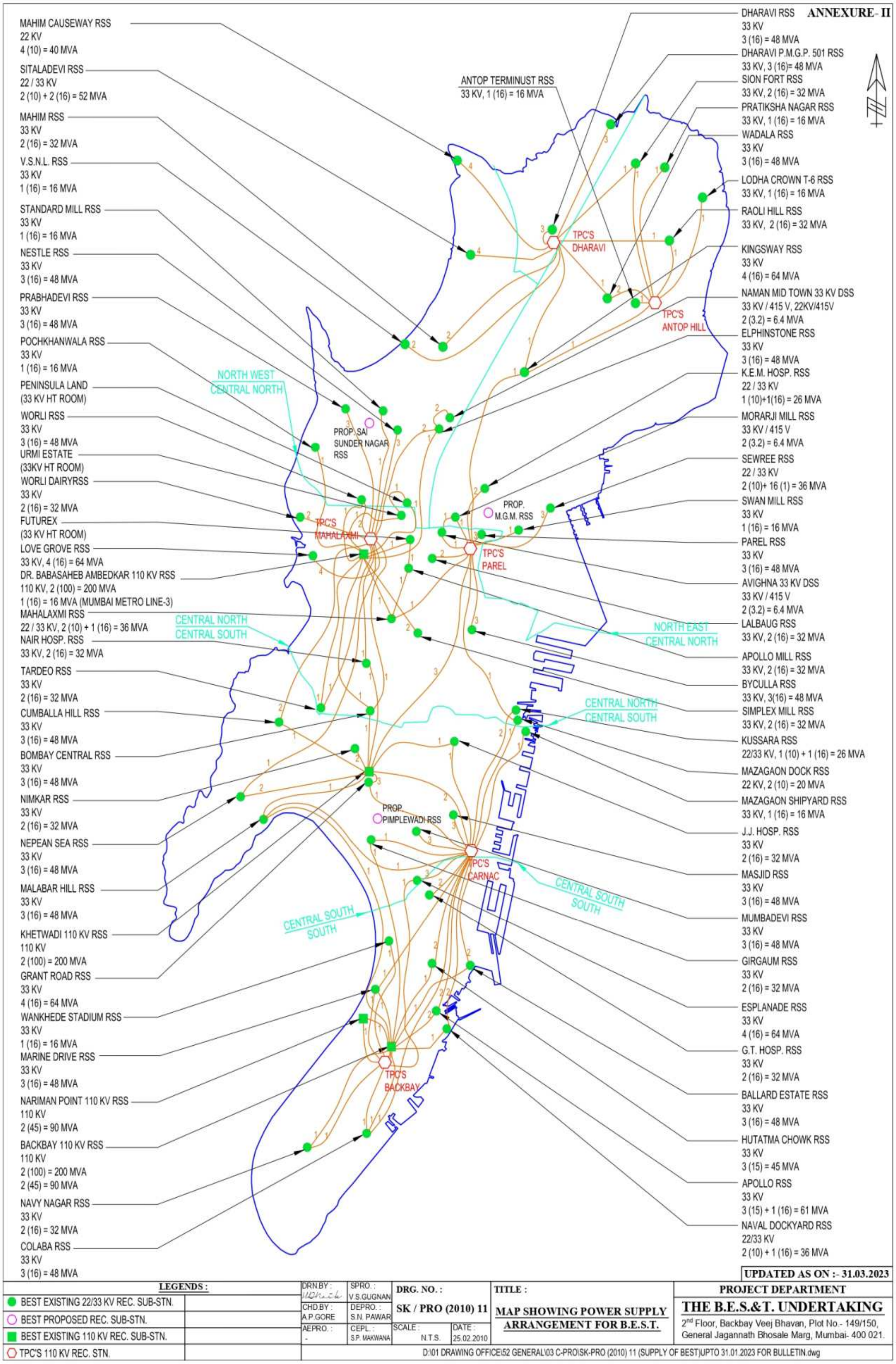
LIST OF TABLE

Abbreviations:

RDSS	Revamped Distribution Sector Scheme
MERC	Maharashtra Electricity Regulatory Commission
CERC	Central Electricity Regulatory Commission
CEA	Central Electricity Authority
BEST	Brihan Mumbai Electric Supply& Transport Undertaking
MW	Mega Watt
MVA	Mega Volt Amp.
MU	Million Units
RSS	Receiving Sub Stations (Distribution Sub Station)
DSS	Distribution Sub Stations (Consumer Sub Station)
CEA	Central Electricity Authority
T/F	Transformer
DT	Distribution Transformer
EFPI	Earth Fault Passage Indicator
ADMS	Advance Distribution Management System
MDM	Meter Data Management
SCADA	Supervisory Control and Data Acquisition
HMI	Human Machine Interface
OLTC	On Load Tap Changer
GIS	Geographical Information System
SRC	Supervisory Remote Control
IED	Intelligent Electronic Devices
ULMC	Unified Load Monitoring Center
RTU	Remote Terminal Equipment
TPC	Tata Power Company
ICCP	Inter Control Center Communication
ZCC	Zonal Control Center
O&M	Operation and Maintenance
SOP	Standard of Performance
AMI	Advance Metering Infrastructure
ERP	Enterprise Resource Planning
OMS	Outage Management System
DMS	Distribution Management System
FFA	Field Force Automation
MCC	Master Control Center
BCC	Backup Control Center
SLDC	State Load Despatch Center
PMA	Project Management Agency
PFC	Power Finance Corporation
REC	Rural Electrification Corporation

Abbreviations:

PLC	Programmable Logic Control
NMS	Network Management Server
IT/OT	Information Technology /Operational Technology
PFC	Power Finance Corporation
GoI	Government of India
NPP	National Power Portal
MoP	Ministry of Power
CM	Connection Management
CRM	Customer Relationship Management
MBC	Metering, Billing and Collection
CSP	Cloud Service Provider
ATS	Annual Technical Support
HR	Human Resource
API	Application Programming Interface
DCS	Distributed Control System
IIoT	Industrial Internet of things
AMR	Automated Meter Reading
CBA	Cost Benefit Analysis


ANNEXURE- II
MAHIM CAUSEWAY RSS
22 KV
4 (10) = 40 MVA
SITALADEVI RSS
22 / 33 KV
2 (10) + 2 (16) = 52 MVA
MAHIM RSS
33 KV
2 (16) = 32 MVA
V.S.N.L. RSS
33 KV
1 (16) = 16 MVA
STANDARD MILL RSS
33 KV
1 (16) = 16 MVA
NESTLE RSS
33 KV
3 (16) = 48 MVA
PRABHADEVI RSS
33 KV
3 (16) = 48 MVA
POCHKHANWALA RSS
33 KV
1 (16) = 16 MVA
PENINSULA LAND
(33 KV HT ROOM)
WORLI RSS
33 KV
3 (16) = 48 MVA
URMI ESTATE
(33KV HT ROOM)
WORLI DAIRYRSS
33 KV
2 (16) = 32 MVA
FUTUREX
(33 KV HT ROOM)
LOVE GROVE RSS
33 KV, 4 (16) = 64 MVA
DR. BABASAHEB AMBEDKAR 110 KV RSS
110 KV, 2 (100) = 200 MVA
1 (16) = 16 MVA (MUMBAI METRO LINE-3)
MAHALAXMI RSS
22 / 33 KV, 2 (10) + 1 (16) = 36 MVA
NAIR HOSP. RSS
33 KV, 2 (16) = 32 MVA
TARDEO RSS
33 KV
2 (16) = 32 MVA
CUMBALLA HILL RSS
33 KV
3 (16) = 48 MVA
BOMBAY CENTRAL RSS
33 KV
3 (16) = 48 MVA
NIMKAR RSS
33 KV
2 (16) = 32 MVA
NEPEAN SEA RSS
33 KV
3 (16) = 48 MVA
MALABAR HILL RSS
33 KV
3 (16) = 48 MVA
KHETWADI 110 KV RSS
110 KV
2 (100) = 200 MVA
GRANT ROAD RSS
33 KV
4 (16) = 64 MVA
WANKHEDE STADIUM RSS
33 KV
1 (16) = 16 MVA
MARINE DRIVE RSS
33 KV
3 (16) = 48 MVA
NARIMAN POINT 110 KV RSS
110 KV
2 (45) = 90 MVA
BACKBAY 110 KV RSS
110 KV
2 (100) = 200 MVA
2 (45) = 90 MVA
NAVY NAGAR RSS
33 KV
2 (16) = 32 MVA
COLABA RSS
33 KV
3 (16) = 48 MVA
DHARAVI RSS
33 KV
3 (16) = 48 MVA
DHARAVI P.M.G.P. 501 RSS
33 KV, 3 (16)= 48 MVA
SION FORT RSS
33 KV, 2 (16) = 32 MVA
PRATIKSHA NAGAR RSS
33 KV, 1 (16) = 16 MVA
WADALA RSS
33 KV
3 (16) = 48 MVA
LODHA CROWN T-6 RSS
33 KV, 1 (16) = 16 MVA
RAOLI HILL RSS
33 KV, 2 (16) = 32 MVA
KINGSWAY RSS
33 KV
4 (16) = 64 MVA
NAMAN MID TOWN 33 KV DSS
33 KV / 415 V, 22KV/415V
2 (3.2) = 6.4 MVA
ELPHINSTONE RSS
33 KV
3 (16) = 48 MVA
K.E.M. HOSP. RSS
22 / 33 KV
1 (10)+1(16) = 26 MVA
MORARJI MILL RSS
33 KV / 415 V
2 (3.2) = 6.4 MVA
SEWREE RSS
22 / 33 KV
2 (10)+ 16 (1) = 36 MVA
SWAN MILL RSS
33 KV
1 (16) = 16 MVA
PAREL RSS
33 KV
3 (16) = 48 MVA
AVIGHNA 33 KV DSS
33 KV / 415 V
2 (3.2) = 6.4 MVA
LALBAUG RSS
33 KV, 2 (16) = 32 MVA
APOLLO MILL RSS
33 KV, 2 (16) = 32 MVA
BYCULLA RSS
33 KV, 3(16) = 48 MVA
SIMPLEX MILL RSS
33 KV, 2 (16) = 32 MVA
KUSSARA RSS
22/33 KV, 1 (10) + 1 (16) = 26 MVA
MAZAGAON DOCK RSS
22 KV, 2 (10) = 20 MVA
MAZAGAON SHIPYARD RSS
33 KV, 1 (16) = 16 MVA
J.J. HOSP. RSS
33 KV
2 (16) = 32 MVA
MASJID RSS
33 KV
3 (16) = 48 MVA
MUMBADEVI RSS
33 KV
3 (16) = 48 MVA
GIRGAUM RSS
33 KV
2 (16) = 32 MVA
ESPLANADE RSS
33 KV
4 (16) = 64 MVA
G.T. HOSP. RSS
33 KV
2 (16) = 32 MVA
BALLARD ESTATE RSS
33 KV
3 (16) = 48 MVA
HUTATMA CHOWK RSS
33 KV
3 (15) = 45 MVA
APOLLO RSS
33 KV
3 (15) + 1 (16) = 61 MVA
NAVAL DOCKYARD RSS
22/33 KV
2 (10) + 1 (16) = 36 MVA
ANTOP TERMINUST RSS
33 KV, 1 (16) = 16 MVA
TPC'S DHARAVI
TPC'S ANTOP HILL
NORTH WEST
CENTRAL NORTH
PROP. SAI SUNDER NAGAR RSS
PROP. M.G.M. RSS
TPC'S MAHALAXMI
TPC'S PAREL
CENTRAL NORTH
CENTRAL SOUTH
NORTH EAST
CENTRAL NORTH
CENTRAL NORTH
CENTRAL SOUTH
PROP. PIMPLEWADI RSS
TPC'S CARNAC
CENTRAL SOUTH
SOUTH
CENTRAL SOUTH
SOUTH
TPC'S BACKBAY
UPDATED AS ON :- 31.03.2023
LEGENDS :
BEST EXISTING 22/33 KV REC. SUB-STN.
BEST PROPOSED REC. SUB-STN.
BEST EXISTING 110 KV REC. SUB-STN.
TPC'S 110 KV REC. STN.
DRN.BY :
CHD.BY :
A.P.GORE
AEPRO. :
-
SPRO. :
V.S.GUGNAN
DEPRO. :
S.N. PAWAR
CEPL. :
S.P. MAKWANA
DRG. NO. :
SK / PRO (2010) 11
SCALE :
N.T.S.
DATE :
25.02.2010
TITLE :
MAP SHOWING POWER SUPPLY ARRANGEMENT FOR B.E.S.T.
PROJECT DEPARTMENT
THE B.E.S.&T. UNDERTAKING
2nd Floor, Backbay Veej Bhavan, Plot No.- 149/150, General Jagannath Bhosale Marg, Mumbai- 400 021.
D:\01 DRAWING OFFICE\52 GENERAL\03 C-PRO\SK-PRO (2010) 11 (SUPPLY OF BEST)UPTO 31.01.2023 FOR BULLETIN.dwg

1. BACKGROUND AND EXISTING SYSTEM INFORMATION:

1.1 Background: Mumbai is considered the financial capital of the country. The BEST Undertaking has been entrusted the work of distribution of electricity in the old city limit of Mumbai from South Mumbai (Navy Nagar) to Sion in the East and to Mahim in the West. BEST provides power supply to more than 10 Lakh consumers.

1.2 Existing System Information:

1.2.1 **Network Characteristics**: - The existing network including various system parameters for the period FY 2020-21 to FY 2022-23 are presented in Table No. 1.

Table:-1 Distribution Network Characteristics

Sr. No.	DESCRIPTION	Unit	2020-21	2021-22	2022-23
1	Area of Electric Supply	Sq.km	72	72	72
2	No. of Meters	Nos.	1044368	1046713	1048660
3	No. of Consumers	Nos.	1025394	1028923	1031816
4	Co-incident Maximum Demand	MVA	***730***	***786***	***899***
5	Co-incident Maximum Demand	MW	723	779	890
6	System Power Factor (Peak)	%	0.9900	0.9900	0.9900
7	System Load Factor	%	62.05	62.56	60.04
8	Units Purchased at T&D	MUs	3926.96	4266.59	4678.68
9	Units Sold	MUs	3838.41	4078.43	4493.29
10	**Average Distribution Loss**	**%**	4.82	4.63	4.01
11	No. of Receiving Sub-stations		64	64	65
12	No. of Power Transformers		153	153	155
13	Capacity of Power Transformers	MVA	2283	2289	2321
14	No. of Distribution Sub-stations		2451	2477	2507
15	No. of Distribution Transformers		3298	3334	3430
16	Capacity of DT	MVA	2682	2717	2842
(c)	**Cable Length**				
17	Length of 33 kV Cable	in km	537	543	559
18	Length of 11 kV Cable	in km	2150	2174	2213
19	Length of 1.1 kV Cable	in km	9025	9148	9340
20	Length of Communication Cable	in km	227	227	227
21	No. of Distribution Pillars		8581	8775	9057
22	No. of HV Capacitors		103	103	103
23	No. of LV Capacitors		3100	3140	3171

*System Load factor = Energy Input /(M.D. X 24 X 365) The coincident maximum demand (MD) in the system has increased from 786 MVA in 2021-22 to 899 MVA in FY 2022-23. The average load factor based on the past three data (FY 2020-21 to 2022-23) is 61.55 % and average power factor is 0.99.

1.2.1 In order to meet additional load and maintain the system in good condition periodical up-gradation of infrastructure is also required.

2. Existing Power / Receiving Substations: ***For the list of existing Receiving Sub-stations, kindly refer Annexure-A.***

3. Tendering procedure at BEST Undertaking (BEST)

3.1 BEST Undertaking adopts the Quality and Cost Based System (QCBS) for procurement of any Equipment and follows the Guidelines of World Bank and Central Vigilance commission (CVC). For least cost procurement of various types of materials required for execution of various schemes, BEST undertaking invites open tender by public advertisement through Two-bid e-tendering method which entails the Technical Bid Eligibility criteria on the website Maha-tender. The Tender Notice is also displayed on the Undertaking's e-tender website viz. www.bestetender.com as well as sent through e-mails to various vendors registered with the Undertaking for that particular item.

3.2 To get competitive and realistic prices, the BEST has also adopted the practice of opening of Two-bid tenders as per State Government GR No.Tender-2012/AN97/PR-7 dtd.23-09-2013. Besides, the items whose prices are volatile due to fluctuation of prices of their raw materials, the BEST has prepared price variation clauses based on the IEEMA Price Variation formulae. This has also resulted into getting competitive and realistic prices.

3.3 Lastly, for utmost transparency, the BEST has prepared guidelines for procurement of materials, wherein the procedure of invitation of tender, types of tender, opening of tender, tender evaluation criteria, guidelines for tender quantity allocation, penal actions for defaulters, etc. and this guidelines are approved by the BEST Committee and the same are displayed on the undertaking's e-tender website for the information of tenderers. ***For material procurement BEST has prepared guidelines and same is enclosed as Annexure-B.***

4. Introduction of Revamped Distribution Sector Scheme (RDSS):

4.1 **Introduction**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' are to achieve an efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like high AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas being concentrated by the government for the development of country. The government has taken initiatives for (i) complete revamping of power sectors electrical equipment across the country and (ii) for the need of changing the way of operation and control of the electrical equipment.

4.1.1 Accordingly,, Govt. of India has launchedthe Revamped Distribution Sector Scheme (RDSS) to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. The Scheme would be available till the year 2025-26. REC and PFC have been nominated as nodal agencies for facilitating implementation of the Scheme. Accordingly, Power Ministry of Govt. of India has issued guidelines for implementation of RDSS. ***For copy of guidelines, kindly refer Annexure-C.***

4.2 Main components of RDSS Schemes:

4.2.1 Part A – Financial support for up gradation of the Distribution Infrastructure and Prepaid Smart Metering & System Metering.

Part B – Training & Capacity Building and other Enabling & Supporting Activities.

4.2.2 The current DPR is for “up-gradation of Distribution Infrastructure”. The DPR for “Implementation of Prepaid Smart Metering & System Metering” through AMI-SP on Design, Built, Finance, Own, Operate & Transfer (DBFOOT) basis is already submitted to the Hon’ble Commission (vide our Letter Ref. No. ESO/AGM(ES)/EM DPR/2022-23/06 dated 31.01.2023) for in-principle approval of the Hon’ble commission. After scrutiny, some data gaps were raised by MERC and subsequently, reply to the data gaps is also submitted to MERC. Now, Vide Reference Letter No. MERC/CAPEX/2023-24/0628 dated 22nd November,2023; MERC has issued in-principle approval.

4.3 Introduction of up-gradation of Distribution Infrastructure Works under RDSS:

4.3.1 BEST was submitted a copy of Action Plan & DPRs vide Letter Ref. No. GM/AGMES/18668/2022 dated 22.08.2022 for Loss Reduction works for ₹2321 Cr, Modernisation & System Augmentation works for ₹ 430.63 Cr and Metering works for ₹708.54 Cr and Capacity building & training for ₹ 0.81 Cr, totalling ₹3460.98 for availing benefits of the RDSS to improve the services of the consumers. Subsequently, vide Letter No. 02:10:RDSS:2021:I:BEST dated 21.11.2022, Executive Director, for PFC has informed that Monitoring Committee for RDSS constituted under Chairmanship of Secretary (power), Govt. of India, in its 13th meeting held on 28.10.2022 has approved the Action Plan and DPR for Loss Reduction works and prepaid smart metering works of BEST under RDSS Scheme costing of **₹ 1632.05 Cr + ₹ 17.07 Cr** (PMA Charges) as against **₹3460.98 Cr**.

4.3.2 **Prepaid Smart Metering**: - Monitoring Committee has approved only₹ 659.17 Cr against BEST's submission ₹708.54 Cr. In addition to this, Monitoring Committee has approved total GBS (including incentive for phase –I)₹146.69 Cr.

4.3.3 **Distribution Infrastructure Works**: Monitoring Committee has approved only ₹972.88 Cr against BEST's submission ₹2321 Cr. for Distribution Infrastructure Works (Loss Reduction). Result Evaluation Matrix for BEST enclosed in the approved letter. ***For copy of submission of Action Plan & DPR and PFC approved letter, kindly refer Annexure-D.***

4.3.4 Action plan and DPR of Modernisation and Capacity Building are not yet approved by the Monitoring Committee. However, PFC has now informed for submission of 'Revised Action Plan and DPR' of Modernisation. Accordingly, DPR for Modernisation Works to be undertaken by BEST under RDSS is under preparation and same will be submitted to the Hon'ble Commission for in principle approval in due course.

4.3.5 **PFC Approved Details**:

Table: 2 Details of PFC approved cost of DPR(Loss Reduction)

Sr. No.	Particulars	Submitted DPR Cost (₹ in Cr)	Approved DPR Cost (₹ in Cr)	Government Grant (₹ in Cr)
A	**Prepaid Smart Metering**			
1.	Prepaid Smart Metering	708.54	659.17	98.88
2.	PMA Charges	-	2.47	1.48
	TOTAL	**708.54**	**661.64**	**100.36**
B.	**Distribution Infrastructure Works (Loss Reduction)**			
1.	Distribution Infrastructure	2320.90	972.88	583.73
2.	PMA Charges	-	14.59	8.76
	Total	**2320.90**	**987.47**	**592.49**
	Grant Total (A+B)	**3029.44**	**1649.11**	**692.85**

Additional incentive of ₹47.82 Cr is also applicable to the Smart Metering Project subject to conditions.

4.4 **Brief Information about the Monitoring Committee Approved Schemes under RDSS**:

4.4.1 **Prepaid Smart Metering**:

Approved details are mentioned in the above Table 2 (Sr. No. A).As per RDSS guidelines, GBS (max) will be 15% of the approved cost of metering including the operational cost, provided that it is not more than ₹ 900 per meter for consumer metering only. Also, additional incentive of ₹ 47.82 Cr for Phase-I Smart Metering will be approved if conditions are fulfilled. Further, monitoring committee has approved ₹2.47 Cr as PMA charges and Government Grant (GBS) for the same is ₹1.48 Cr.

4.4.2 **Distribution Infrastructure Works**: Approved details are mentioned in the above Table 2(B). As per RDSS guidelines, the GBS (max) will be 60% of the approved cost of Distribution infrastructure works.

4.4.2.1 Item wise Distribution Infrastructure works approved by PFC under Loss Reduction:-

Sr. No.	Particulars	PFC Approved Cost in ₹ Cr.
1.	ERP, Billing Software and IT/OT enablement works	75.98
2.	Implementation of SCADA & DMS (ADMS)	143.72
3.	Replacement of old switchgears	116.03
4.	Renovation/Augmentation of Infrastructure at Receiving Substations	50.23
5.	Renovation/Augmentation of Infrastructure at Distribution Substations	201.36
6.	Renovation/Augmentation of HV, LV Lines	313.03
7.	Auxiliary Component Cost for Consumer Metering	72.53
	TOTAL	**972.88**

Monitoring committee has totally approved ₹17.07 Cr as PMA Charges, out of which ₹ 2.47 Cr. for Smart Metering works and ₹14.59 Cr. infrastructure works. GBS (Grant) for the same is ₹8.76 Cr. for infrastructure works and ₹1.48 Cr for Smart Metering works. The Government Grant amount (GBS) for PMA charges will be 60% of the approved cost of PMA. ***For detail PFC approval, kindly refer Annexure-D.***

4.5 Appointment of Project Management Agency (PMA) by Utility:

As per guidelines of Revamped Distribution Sector Scheme (RDSS), one or more Project Management Agency (PMA) shall be appointed by each DISCOM for project formulation and project management, based on their requirement to cover different phases of the project. The scope of PMA may include preparation of plan, DPR, tender documents, awarding, monitoring, quality assurance, material inspection, results evaluation or any other related works. (Excluding signing of Joint Measurement Certificate).

4.6 Brief information about the tendering process by BEST:

4.6.1 The separate tenders were invited for execution of Distribution Infrastructure related works for (i) Power / Receiving Substations (RSS) (ii) Distribution Substation (DSS) (iii) Auxiliary component for consumer metering (iv) Implementation of ADMS (SCADA & DMS) by appointing Agency (ADMS-IA) (v) Implementation of ERP, Billing Software and IT/OT enablement work and (vi) Appointment of PMA for Smart metering works &Distribution Infrastructure related works.

4.6.2 Now, the tender for all the items mentioned in above Para 4.5.1 is finalised and order is placed on respective firms. Summary of Tender details are as follows:

4.6.2.1 Power / Receiving Substations (RSS) Related Works:

A per CAPEX Regulation, 2022, Appendix-3, tender for "Power/Receiving Substation (RSS) Related Works" was invited; techno-commercial bid and price were opened on 13.10.2022 and 18.10.2022 respectively. In the bidding process, 3 Nos. of bidders have participated. Details of offers received are given in the following table.

Table 3: RSS Tender Comparative Statement

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking
1	Larsen & Toubro Ltd.	3,62,64,49,682.54	3
2	KEI Industries Ltd	4,11,76,59,705.58	2
3	**The Tata Power Co. Ltd.**	**3,44,62,66,417.32**	**1 (LAO)**

The tender is awarded to the LAO viz. Tata Power Co. Ltd. with contractual value of ₹ 344.63 Cr. The offers are excluding R.I. charges towards excavation for cable laying work. ***For detailed as mentioned in the above table, a copy of LoA &Administrative Resolution (AR) is enclosed as Annexure-H, Pg. No. 9 to 25 of 6 &Annexure –E, Pg. No. 18 of 78 respectively.***

4.6.2.2 Distribution Substation (DSS) Related Work: -As per CAPEX Regulation, 2022, Appendix-3, tender for "Distribution Substation (DSS) related works" was invited; techno-commercial bid and price bid was opened on 08.05.2023 &08.05.2023respectively. In the tendering process 3 Nos. of bidders have participated. Details of offers received are given in the following table.

Table 4: DSS Tender Comparative Statement

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking
1	**Rahul Cables Pvt. Ltd.**	**420,65,00,001.32**	**1 (LAO)**
2	KEI Industries Ltd	495,33,73,590.22	2
3	Megha Engineering & Infrastructures Limited	707,08,65,487.84	3

The tender is awarded to the LAO viz. Rahul Cables Pvt. Ltd. with total contractual value of ₹ 420.65 Cr. The offers are excluding R.I. charges towards excavation for cable laying work. ***For detailed as mentioned in the above table, a copy of LoA and Administrative Resolution (AR) is enclosed as Annexure –H, Pg. No. 26 to 36 of 68&Annexure –E, Pg. No. 31 of 78 respectively.***

4.6.2.3 Auxiliary component for consumer metering: A per CAPEX Regulation, 2022, Appendix-3, tender for "Refurbishment of Meter Boards in the 240/415V Service Positions housing the LV Meters (Material and Labour) at Consumers premises", techno-commercial bid and price bid was opened on24.04.2023 and 02.05.2023 respectively. In the tendering process, total 4 Nos. of bidders have taken part. Details of offers received are given in the following table.

Table 5: Meter Board Tender Comparative Statement

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking
1	ASTS Smart Infrastructure Pvt. Ltd.	82,04,49,771.50	1 (LAO)
2	Ramelex Private Limited	84,94,90,356.74 # (Revised Offer) (82,04,48,763.16)	2
3	JBS Enterprises Pvt. Ltd.	1,35,80,52,806.60	4
4	SAP Control Systems and Engineers Pvt. Ltd.	1,02,07,93,423.62 # (Revised Offer) (82,04,49,771.50)	3

Tenderer No. 2 & 4 has matched their rates (#) with LAO. Hence, as per tender guidelines, by considering quoted price difference, tender quantity is divided between ASTS Smart Infrastructure Pvt. Ltd. (60%) and Ramelex Private Limited (40%) with total contractual value of ₹ 82.04 Cr. ***For detailed as mentioned in the above table, a copy of LoA and Administrative Resolution (AR) is enclosed as Annexure –H, Pg. No. 65 to 68 of 68&Annexure –E, Pg. No. 71 of 78 respectively.***

4.6.2.4 Implementation of Advanced Distribution Management System (ADMS): A per CAPEX Regulation, 2022, Appendix-3, tender for "Implementation of ADMS by Appointing ADMS-IA, techno-commercial bid and price bid was opened on 09.01.2023 and 13.01.023 respectively. In the tendering process 3 Nos. of bidders have quoted for said work. Details of offers received are given in the following table.

Table 6: ADMS Tender Comparative Statement

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking	FMS Period
1	**Larsen & Toubro Ltd.**	**204,75,52,097.77**	**1 (LAO)**	**7 Yrs**
2.A	**Larsen & Toubro Ltd.**	**182,15,00,255.70**	**1 (LAO)**	**5 Yrs**
2	Enzen Global Solutions Pvt. Ltd	231,52,91,422.95	2	**7 Yrs**
3	The Tata Power Co. Ltd.	338,58,91,609.98	**3**	**7 Yrs**

The tender was awarded to the LAO viz. Larsen & Toubro Ltd. With total contractual value of Rs. 204.76 Cr. with 7 Years FMS. However, PFC has approved only 2 Years FNS Charges, hence BEST has revised FMS period from 7 yrs to 5 yrs with revised contractual value of **₹ 182.15.*****For detailed as mentioned in the above table, a copy of LoA and Administrative Resolution (AR) is enclosed as Annexure-H, Pg. No. 54 to 64 of 68 and Annexure -E, Pg. No. 62 to 63 of 78 respectively.***

4.6.2.5 Implementation of ERP, Billing Software& IT/OT enablement works: - As per CAPEX Regulation, 2022, Appendix-3, tender, for "appointing Implementation Agency for said work", techno-commercial bid and price bid was opened on 24.05.2023 &26.05.2023 respectively. In the tendering process only single has taken part. For better response the tender was postponed for 16 times then only Single bidder was quoted for said work. Details of offer received are given in the following table.

Table 7: IT/OT Tender Comparative Statement

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking
1	**Infinite Computer Solution India Ltd.**	**235,93,24,774.13**	**1 (Only Offer)**

The tender is awarded to Infinite Computer Solution India Ltd. with total contractual value of ₹ 235.93 Cr. ***For detailed as mentioned in the above table, a copy of LoA and Administrative Resolution (AR) is enclosed as Annexure-H, Pg. No. 37 to 53 of 68 and Annexure -E, Pg. No. 43 of 78 respectively.***

4.6.2.6 **Appointment of PMA for Prepaid Smart Metering and Distribution Infrastructure works:** As per CAPEX Regulation, 2022, Appendix-3, tender, tender was invited for Appointment of PMA, through open bidding. For getting competitive rates, BEST has advertised the tender in the local as well as all over India. The tender notice was also displayed on the BEST undertaking's e-tender website. For better response tender was cancelled/postponed 3 times. Techno-commercial bid and price bid was opened on 08.02.2023 and 16.02.2023respectively. In the tendering process 3 Nos. of bidders have taken part. Details of offers received are given in the following table.

Table 8: PMA Tender Comparative Statement

Tr. No.	Name of the Tenderer	Basic Rate (₹)	Total Contractual Value (₹)	Ranking
1	Wapcos Ltd.	13,20,00,000.00	15,57,60,000.00	1
2	IRCLASS Systems and Solutions Pvt. Ltd	Price Bid Not opened		-
3	REC Power Development and Consultancy Ltd.	23,39,75,280.00	27,60,90,830.00 Revised Rates **15,23,61,600.00**	**2 (#)LAO**

(i) Initially the tender was awarded to the LAO viz. Wapcos Ltd. with total contractual value of ₹15.58 Cr.

(ii) Wapcos was not any experience of such work, therefore, management has decided to award the said work to REC Power Development and Consultancy Ltd. (2nd LAO) who has revised their Rates below of LAO i.e. ₹15.24 Cr. ***For detailed as mentioned in the above table, a copy of LoA is enclosed as Annexure-H, Pg. No. 1 of 68.***

4.7 Schemes Executed under RDSS (Loss Reduction): -

The Schemes are to be executed under RDSS are given in the following table**.**

Table 9: Particulars of RDSS Work (Summary)

Section No.	Distribution Infrastructure Related Works and Smart Metering	Tender Cost (in Cr)
1.	Power / New receiving Sub-Station (RSS) (Excluding RI Charges)	344.63
2.	Distribution Sub-Station (DRSS) (Excluding RI Charges)	420.65
3.	Auxiliary components FOR Prepaid Smart Metering	82.05
4.	Implementation of SCADA & DMS (ADMS)	182.15
5.	Implementation of ERP, Billing Software& IT/OT enablement Works	235.93
6.	PMA Charges	15.24
6. $	Prepaid Smart Meters	1303.16

$ -Now, DPR for Prepaid Smart Metering is in-principally approved by the Hon'ble commission on 22.11.2023.

4.7.1 Item wise PMA Charges allocation given in the following table:

Table 10: Approved DPR cost & GBS details **(₹ in Cr)**

Sr. No.	Item Description	Approved Cost	PMA Charges	GBS for PMA Charges	PFC GBS (Grant)
A	**B**	**C**	D =C*1.5%	E=D*60%	F
1	Smart Meters	659.17	# 2.47	1.48	98.88
	Infra work				
2	RSS	232.92	3.49	2.10	**139.75**
3	DSS	447.73	6.72	4.03	**268.64**
4	Auxiliary Equipments	72.53	1.09	0.65	**43.52**
5	ADMS	143.72	2.16	1.29	**86.23**
6	ERP, Billing Software, IT/OT and MDM	75.98	1.14	0.69	**45.59**
	TOTAL COST in Cr.	**1632.05**	**17.07**	**10.24**	**483.73**

(1) PMA cost for infrastructure works will be1.5% of approved cost i.e.₹ 972.88 and for Smart Meters it will be 2.5% of approved GBS i.e.₹ 98.88. (2) For Smart Meter GBS is 15% of approved Rs.98.88 Cr and for infrastructure works, GBS will be 60% of approved ₹ 972.88 Cr.

4.7.2 Item wise PMA Charges allocation given in the following table:

Table 11: Comparison of RDSS approved cost vs tendered cost (₹in Cr.)

Sr. No.	Item Description	Tender Cost	PFC Approved GBS	PMA Charges	GBS for PMA Charges	Total PFC BEST GBS
A	**B**	**C**	**D**	**E**	**F**	**G =D+F**
1	Smart Meters	1303.16	98.88	2.47	1.48	#1.48
	Infra work					
2	RSS	344.63	**139.75**	3.05	2.10	141.85
3	DSS	420.65	**268.64**	5.88	4.03	272.67
4	Auxiliary Equipments	82.04	**43.52**	0.95	0.65	44.17
5	ADMS	182.15	**86.23**	1.89	1.29	87.52
6	ERP, Billing Software& IT/OT	235.93	**45.59**	1.00	0.69	46.28
TOTAL COST in Cr. (2 to 6)		**1265.40**	**583.73**	**@ 15.24**	**@ 10.24**	**@ 593.97**
	@ -Total PMA Charges including Smart Meters (Sr. No. 1 to 6), #-PMA Cost only					

SCHEMES EXECUTED UNDER RDSS (LOSS REDUCTION)

SECTION 1:

INFRASTRUCTURE RELATED WORKS AT POWER / RECEIVING SUBSTATION (EXCLUDING CIVIL WORKS)

Figure 1: Power Transformer

Figure 2: 33 kV switchgears

Figure 3: 11 kV switchgears

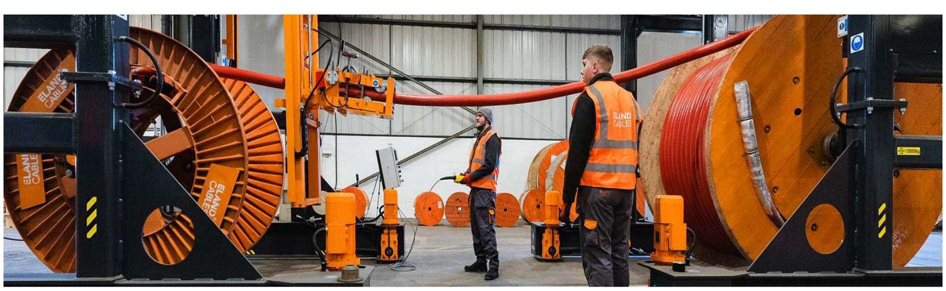


Figure 4: Power cable

4.8 SECTION 1:

1. Objective and Scope of Work:

1.1 Objective: This project aims at –

(i) 24x7 power supply for consumers in Mumbai City.

(ii) Reduction of AT&C losses/maintaining of existing low level of AT&C losses

(iii) To maintain reliability and quality of Electric Supply to the Consumers.

1.2 Scope of Work:

(A) Installation of additional 33/11 kV, 12 MVA T/Fs with accessories (Qty-2 Nos.),

(B) Replacement of 22/11kV and 33/11 kV T/Fs (Qty-18 Nos.),

(C) Replacement of 33 kV, 1500 MVA Primary Switchgears (Qty-18 Nos.)

(D) Replacement of 11 kV, 350 MVA Secondary switchgears (Qty-32 Nos.) and

(E) Replacement of 33 kV, 3CX300 SQ. MM. Cu XLPE Cable (Qty- 100 Km.) and additional lying of 33 kV, 3CX300 SQ. MM. Cu XLPE Cable (Qty- 20 Km.)

2. Technical feasibility report of the RSS Schemes:

(A) Installation of additional 16 MVA, 23/11kV and 16 MVA, 23/11-6.6kV T/F sand associated equipments at Pratiksha Nagar and Naval Dock RSS respectively.

(1) Common Justification for installation of additional T/Fs at Pratiksha Nagar and Naval Dock RSS:

(i) **Need of Revamping / Augmentation of Receiving Sub Station (RSS)**:

Economic growth especially in service sector would increase the consumption in the commercial sector. The development plan of Mumbai envisages a higher growth through development of new areas due to development of Mill Land Area and various SRA Schemes. It is projected that future increase/growth will be both because of relocation / migration and natural growth. Ultimately, due to development in residential and commercial spaces, BEST needs to procure more power and for that additional infrastructure is required to be established.

BEST is intent on creating a distribution network that is capable of meeting all the new demand arising either due to increase in consumption among the existing consumers or due to Mill Land and SRA Development in its area of supply.

Due to space constraints most of the developers are reluctant for giving space for new receiving substations. In most of the Mill Lands in Mumbai having power supply of M/s. TPC (D). In order to acquire and electric supply to such consumers, it is now necessary to inform a flexible space requirement for RSS. Also, as per MERC regulation, developer may opt the electric supply from M/s. TPC, which is already having its own infrastructure. In a competitive age and in order to acquire bare minimum space for construction of RSS without compromising security and safety. The open space requirement around the RSS Structure may vary as per location and as per statutory requirement of CFO, EEBP.

At nearby Pratiksha Nagar and Naval Dock RSS, there is no open plot available for development, hence, it is not possible to release the load by commissioning new RSS.

(ii) **MYT Regulation:** As per Clause No. 74.1 of MYT Regulation 2019, the Distribution Licensee shall submit a detailed Capital Investment Plan, financing plan and physical targets for each year of the control period strengthening and augmentation of its distribution network meeting the requirement of load growth, reduction in distribution losses, improvement in quality of supply, reliability, metering, reduction in congestion, etc, to the commission for in principal approval, as a part of the Multi Year Tariff Petition for the entire control period.

(iii) As per Capex Regulation, 2022 Clause, 3.9 (a) Infrastructure is required for releasing new supply connection of EV Charging at Anik Bus Depot and new supply connection of Indian Naval Authority, 3.9 (e) Capital Nature funded schemes partially by Central Government of India for commissioning of additional T/F at Pratiksha Nagar and Naval Dock RSS, 6.9 (h) Capacity augmentation of RSS by installing additional T/F at Pratiksha Nagar and Naval Dock RSS, 3.9 (i & o) Improvement in quality and reliability of distribution system and improvement in consumer services at both RSS.

(iv) **Prudence of Investment**: In this case the electrical equipments such as T/Fs, switchgears, capacitors, Reactors, control Panels, etc are required for installation at existing RSS and to achieve least cost option, required electrical equipments and associated accessories will be procured through competitive bidding as per Capex Regulation 2022. ***For detail refer Para 3 i.e. Tendering procedure of BEST Undertaking.***

As per Capex Regulation, 2022, Regulation 3.1 and Regulation 4.1 Capital investment is proposed under RDSS Scheme. ***A copy of Annexure-F _Policy for requirement of space for DSS/RSS.***

(A1) At Pratiksha Nagar RSS: additional 23/11kV, 16 MVA, T/F and associated equipments

1. **Demand side requirement**: BEST Transport Division has allocated job of commissioning of EV Charging stations to M/s. Olectra, M/s. Switch Mobility, E-Causis and M/s Chaloat various Depots. Subsequently, we have received load requirement for installation, & commissioning of EV Charging Stations at various Bus Depot including Anik Bus Depot within BEST's supply Jurisdiction. ***Copy of the mail is enclosed as Annexure-G.***
2. Further, M/s Chalo had been started their operation premium AC service buses from Anik Depot by using 760 kW load supplied by BEST and they have further applied for additional 2250 kW load at BEST's Anik Bus Depot. on 28.11.2022 and 1600 kW loads at BEST's Worli Bus Depot. on 12.10.2022.In addition to this, we have received additional load requirement of 15500 kW i.e. 15.50 MW from other vender's (including 7.92 MW load requirement of M/s Olectra) for commissioning of EV Charging Stations.

3. To meet 15.5 MW (16.66 MVA, P.F 0.99) load requirement of EV Charging Stations at BEST's Anik Bus Depot., it is necessary either to commission 33/11 kV, 1X16 MVA T/F new RSS at Anik Bus Depot. or require to install additional 33/11 kV, 1X16 MVA T/F at existing nearby RSS.

4. Pratiksha Nagar RSS is 3 T/F RSS. However at RSS, 33/11 kV, 1x16 MVA, T/F No. 1 had been commissioned under IPDS in the year 2020 which is fed from 33 kV bus Section of TPC 220 kV Antop Hill RS. The commissioning of T/F No.2 had postponed because sufficient amount of load requirement was not received from the consumers. Now, load requirement (15.50 MW) of EV Charging is received from Transport Division and our existing Pratiksha Nagar RSS is very close to the Load Center and having spare space for installation of additional T/F would result saving in the civil cost of new RSS.

5. Load details of Pratiksha Ngr (PN), Sion Fort (SF) and Lodha Crown (LC) RSS :

Table 12: Load details for Pratiksha Nagar RSS (last 5 years)

RSS Name (Capacity MVA)	Tr. No.	Peak Load														
		2018-19			2019-20			2020-21			2021-22			2022-23		
		AMP	MVA	%	AMP	MVA	%	AMP	MVA	%	AMP	MVA	%	AMP	MVA	%
PN (16)	1	0	0	**0**	68	3.89	**25**	80	4.57	**29**	84	4.80	**30**	85	4.80	**30**
SF (16)	1	146	8.35	**52**	146	8.35	**52**	104	5.94	**37**	119	6.80	**42**	114	6.52	**41**
SF (16)	2	144	8.23	**51**	128	7.32	**46**	62	3.54	**22**	74	4.23	**26**	75	4.29	**27**
LC (16)	1	80	4.57	**29**	84	4.80	**30**	104	5.94	**37**	128	7.32	**46**	136	7.77	**49**

6. The existing T/F at Pratiksha Nagar RSS is loaded up 30% of the capacity. In case of failure of this T/F or its associated switchgear or 33kV incoming feeder it would be difficult to restore the supply especially in peak hours. There is no other RSS substation in the entire stretch from Pratiksha Nagar RSS up to Sion Fort RSS or Lodha Crown or Raoli Hill RSS. In this case Sion Fort, Lodha Crown and Raoli Hill RSS are about 2 Km, 2.6 Km and 2.3 Km away from Pratiksha Nagar RSS. In such situation, even though, RSS T/F is only 30% loaded, it is very difficult to release 15.5 MW load of EV Charging at Anik Depot on this T/F. For contingency point of view, it is necessary to install one more T/F at Pratiksha Nagar RSS. ***Kindly, refer Annexure-G.***

7. Sion Fort RSS is in the vicinity of Pratiksha Nagar RSS (about 2 Km away). Even though both T/Fs at Sion Fort RSS are under loaded, it is not advisable to put further load on these T/Fs. Since, in this area there are about 26 Nos. of requisitions are pending for releasing the load about 3.98 MW. In case of failure or outage of T/F at Pratiksha Nagar RSS, would require a large amount of load to be transferred on the other transformers, causing large number of 11/6.6 kV feeder operations. It not only increases off supply time, but also deteriorates the 11-6.6 kV cable network, revenue loss and increases maintenance cost. Further to this, due to Harbour railway line, it is very difficult to obtain permission from railway authority for laying additional 11 kV feeder cables from Sion Fort RSS for Pratiksha Nagar RSS.***For requisition details, refer Annexure G.***

8. BEST had already laid the 33kV cable for additional TR No. 2 at Pratiksha Nagar RSS from TPC Antop Hill RS.

9. In view of above, to create sufficient redundancy for quick supply restoration in the event of fault and facilitate load transfer for routine maintenance work, BEST Undertaking has proposed to install additional 1x16MVA, 33/11kV power transformer at Pratiksha Nagar RSS under RDSS.

10. **STU application and permission for connection of additional 33 kV feeders**:

10.1 Vide Application No, PR/Adm.9A (14)/STU/1068/2017 dated 03.04.2017 connection application was made to Chief Engineer STU for allotment of 33 kV outlets to BEST from TPC Mahalaxmi RS & TPC Antop Hill RS.

10.2 Accordingly, vide Letter No. MSETCL/CO/STU/Sys/BEST/00919 dated 22.01.2018, Chief Engineer (STU) has allotted 33 kV outlets to BEST from TPC Mahalaxmi RS & TPC Antop Hill RS and ***copy of allotment letter is enclosed as Annexure-J1***.

11. For existing SLD of Pratiksha Nagar RSS, **refer Annexure- G.**

12. **Costing of Pratiksha Nagar RSS Additional T/F Scheme**:

Table 13: Cost sheet of Pratiksha Nagar RSS

Sr. No.	Particulars	Qty / Unit	Basic Rate (in ₹)	Basic Rate with GST (in ₹)
A	**B**	**C**	**D**	**E=1.18*C*D**
	Material Cost (Supply, Installation, commissioning of Equipments)			
1.	33/11 kV, 16 MVA T/F with Accessories	1 No.	1,75,43,337.18	2,07,01,137.87
2.	33 kV, 1500 MVA Switchgear with Accessories	1 No.	16,40,446.91	19,35,727.35
3.	11 kV, 350 MVA Bus Section (10 Panels) with Accessories	1 No.	82,76,588.07	97,66,373.92
	Erection cost (including all miscellaneous items)			
1.	33/11 kV, 16 MVA T/F with Accessories	1 No.	58,47,779.06	69,00,379.29
2.	33 kV, 1500 MVA Switchgear with Accessories	1 No.	5,46,815.63	6,45,242.44
3.	11 kV, 350 MVA Bus Section (10 Panels) with Accessories	1 No.	27,58,862.69	32,55,457.97
	TOTAL			**4,32,04,318.86**

12.1 The cost of installation of additional T/F with Accessories includes the Material and Erection cost of T/F, 33 kV Switchgear, 11 kV Switchgear, 33 kV, 3CX300 sq mm cable, 11 kV, 1CX500 sq mm cable, FRLS cables, Termination kits for 11 kV, 1CX500 sq mm and 33 kV, 3CX300 sq mm cable, Control cable glands, Cu Strips etc. For detail of quantity kindly refer Annexure-W, Pg. No. 2, 3 & 5.

12.2 The cost estimated is least cost. Because the cost considered for estimation is based on the PO placed on M/s Tata Power Co. Ltd. and ***for copy of P.O., kindly refers Annexure-H, Pg. No.9 to 25 of 68***

(A2) At Naval Dock RSS: additional 16 MVA, 23/11-6.6 kV T/F and associated equipments

1. History: Earlier vide MERC Letter Reference No. MERC/CAPEX/2019-20/135 dated 10 May, 20219 in-principle approval of the Hon'ble commission was obtained for "Revamping of Existing Receiving Sub Stations (Capital Investment Scheme for FY2017-18 to FY2019-20)". ***For copy of the approval, kindly refers, Annexure-I, Pg. No. 1 to 5 of 27.***
2. The installation and commissioning of T/F work at Naval Dock RSS was deferred due to delay in civil work. The location of Naval Dock RSS is inside the premises of Naval area. Therefore, due to security reasons, strict restrictions on outside personnel entering in the Naval premises, considerable time had elapsed for security check of contractor personnel before entering in the Naval premises. The scheme at Naval Dock is completed except installation of T/F. The assets such additional 11 kV Bus Section is put to use from other bus section. Now the DPR is closed on 11.11.2022 (pending work- Installation of T/F), ***for copy of closed DPR, kindly refers, Annexure-I, Pg. No. 6 to 8 of 27.***
3. Now, BEST has decided to install T/F at Naval Dock under RDSS to avail the grand facility of GoI. Please kindly note that while submitting the DPR it was clearly mentioned that "the estimated cost of T/F was considered as NIL. Initially It was decided to commission old 10/12.5 MVA, 22/11-6.6 kV, Sr. No. 90WF-003/6, Kirloskar Make, Manufacturing year 1992 T/F at Naval Dockyard RSS. Being an old transformer and already completed 31 years of their useful service life, for providing reliable and quality uninterrupted power supply to the consumers, it is decided not to use this old T/F.
4. While approving the Scheme, the Hon'ble commission raised various data gaps and same were replied to them. ***Copy related to Naval Dock submission is enclosed as Annexure I, Pg. No.9 to 27 of 27.***
5. **STU Permission**: Vide Application No, PR/Adm.9A (14)/STU/196/2023 dated 07.08.2023 connection application was made to Chief Engineer STU for allotment of 3 Nos. of 33 kV outlets to BEST to meet new Load Demand of HT consumer from TPC Carnac RS. Accordingly, vide Letter No. MSETCL/CO/CE/STU/BEST/6791 dated 25.09.2023, Chief Engineer (STU) has allotted 3 Nos. of 33 kV outlets to BEST from TPC Carnac RS ***and copy of allotment letter is enclosed as Annexure-J2.***
6. Table 14: Cost Sheet of Naval Dock RSS T/F

Sr. No.	Particulars	Qty / Unit	Basic Rate (in ₹)	Basic Rate with GST (in ₹)
A	**B**	**C**	**D**	**E =1.18*C*D**
1.	Supply, Installation, commissioning of T/F at Naval Dock RSS (Material Cost)	1 No.	1,80,25,788.50	2,12,70,430.44
2.	Erection Cost of T/F at Naval Dock RSS	1 No.	60,08,596.10	70,90,143.40
	Total commissioning cost of T/F	**1 No.**	**2,40,34,384.60**	**2,83,60,573.84**

6.1 Please kindly note that except all associated accessories are already installed at Naval Dock RSS, hence cost of other items such as 33 kV Switchgear, 11 kV Bus Section etc is not considered.

6.2 As per Capex Regulation, least cost is achieved through open tendering procedure. The cost estimated is least cost. Because the cost considered for estimation is based on the PO placed on M/s Tata Power Co. Ltd. and ***for copy of P.O, kindly refers Annexure-H, Pg. No.9 to 25 of 68.***

(B) Replacement of 18 Nos. of existing Transformers at RSS viz. Mahalaxmi (2), Sitaladevi (1), Mazgaon Dock (2), Naval Dock (2), Apollo (3), Hutatma Chowk (3), Sewree (2), Kussara (1), KEM Hospital (1), and Mahim (1).

1. Details of transformers installed at various RSS are given in the following table:

Table: 15 Details of Transformers under RDSS replacement

SR. NO.	Name of RSS	MAKE	T/F No.	CAPACITY (MVA)	Voltage Ratio	YEAR OF MFG	T/R Life
33 kV Changeover (22/11-6.6 kV, 10/12.5 MVA T/F with 33/11-6.6 kV , 16 MVA T/F)							
1.	Mahalaxmi	NEI	1	10/12.5	22/11-6.6	1973	50
2.	Mahalaxmi	KIRLOSKAR	3	10/12.5	22/11-6.6	1989	34
3.	Sitaladevi	B-BIJLEE	4	10/12.5	22/11	1984	39
4.	MazgaonDok	C & G	2	10/12.5	22/11-6.6	1985	38
5	Mazgaon Dock	C & G	1	10/12.5	22/11-6.6	1989	34
6.	Sewree	VOLTAS	3	10/12.5	22/11	1991	32
7.	Sewree	KIRLOSKAR	1	10/12.5	22/11	1992	31
8.	Kussara	KIRLOSKAR	2	10/12.5	22/11-6.6	1991	32
9.	KEM	KIRLOSKAR	1	10/12.5	22/11-6.6	1992	31
10.	Naval Dock	CG	1	10/12.5	22/6.6	1985	38
11.	Naval Dock	KIRLOSKAR	2	10/12.5	22/6.6	1985	38
Replacement of 33/11 kV, 15/16 MVA T/Fs with 33/11 kV, 16 MVA T/Fs							
12.	Apollo	KIRLOSKAR	1	15	33/11	1988	35
13.	Apollo	KIRLOSKAR	2	15	33/11	1988	35
14.	Apollo	KIRLOSKAR	3	15	33/11	1988	35
15.	Hutatma Chowk	BHARAT-BIJLEE	1	15	33/11	1989	34
16.	Hutatma Chowk	BHARAT-BIJLEE	2	15	33/11	1989	34
17.	Hutatma Chowk	BHARAT-BIJLEE	3	15	33/11	1989	34
18.	Mahim	VOLTAS	1	16	33/11	1993	30

1.1 Peak Load (Last 5 Year):

Table 16 Peak Load at RSS (Last 5 Years)

RSS Name	Tr. No.	Peak Load														
		2018-19			2019-20			2020-21			2021-22			2022-23		
		AMP	MVA	%	AMP	MVA	%	AMP	MVA	%	AMP	MVA	%	AMP	MVA	%
MH	1	190	7.24	72	169	6.44	64	177	6.74	67	155	5.91	59	153	5.83	58
MH	2	96	5.49	34	90	5.14	32	79	4.52	28	117	6.69	42	160	9.15	57
MH	3	136	5.18	52	103	3.92	39	114	4.34	43	145	5.53	55	151	5.75	58
ST	1	0	0	0	94	3.58	36	104	3.96	40	126	4.80	48	112	4.27	43

ST	2	190	10.86	68	175	10.00	63	148	8.46	53	177	10.12	63	193	11.03	69
ST	3	169	6.44	64	141	5.37	54	92	5.26	33	105	6.00	38	115	6.57	41
ST	4	182	6.94	69	166	6.33	63	108	4.12	41	132	5.03	50	134	5.11	51
MD	1	182	6.94	69	193	7.35	73	193	7.35	73	212	8.08	81	192	7.32	73
MD	2	182	6.94	69	190	7.24	72	183	6.97	70	204	7.77	78	200	7.62	76
SEW	1	180	6.86	69	136	5.18	52	102	3.89	39	193	7.35	74	169	6.44	64
SEW	2	155	8.86	55	122	6.97	44	152	8.69	54	174	9.95	62	161	9.2	58
SEW	3	164	6.25	62	135	5.14	51	168	6.40	64	205	7.81	78	199	7.58	76
K	1	137	5.2	52	118	4.50	45	66	2.51	25	85	4.86	30	117	6.69	42
K	2	186	7.1	71	180	6.86	69	180	6.86	69	240	9.15	91	230	8.76	88
KEM	1	169	6.4	64	199	7.58	76	211	8.04	80	161	6.13	61	146	5.56	56
KEM	2	122	7.0	44	125	7.14	45	105	6.00	38	114	6.52	41	131	7.49	47
ND	1	108	4.12	41	123	4.69	47	104	3.96	40	97	3.70	37	106	4.22	42
ND	2	148	5.64	56	116	4.42	44	81	3.09	31	91	3.47	35	91	3.63	36
ND	3	86	3.28	33	76	2.90	29	126	4.80	48	118	6.74	42	118	6.74	42

MH-Mahalaxmi, ST-Sitaladevi, MD- Mazgaon Dock, SEW-Sewree, K- Kussara, KEM-KEM Hospital, ND-Naval Dock

1.3 Kindly refer above Table No.13. All 11 Nos. of 22/11-6.6 kV, 10/12.5 MVA T/Fs (Sr. No. 1 to 11) are Proposed to be replaced with 33/11kV, 16 MVA except Naval Dock RSS and at Naval Dock RSS (Sr. No. 10 & 11) T/Fs will be replaced with 33/11-6.6 kV, 16 MVA T/Fs. Further to this, all 7 Nos. of 33/11 kV, 15/16 MVA T/Fs (Sr. No. 12 to 18) are proposed to be replaced with 33/11 kV, 16 MVA under RDSS.

2. Replacement of T/Fs at Mahalaxmi (2 Nos.), Sitaladevi (1 No.), Mazgaon Dock (2 Nos.), Sewree (2 Nos.), Kussara (1 Nos.), KEM Hosp (1 Nos.) & Naval Dock (2 Nos.) RSS,(Qty- 11 Nos.)

2.1 Technical Justification for replacement of T/Fs at Mahalaxmi RSS:

2.1.1 Life of T/Fs: The existing Mahalaxmi T/F No. 1 & 3 had been completed their useful life of 25 years by giving service of 50 & 34 years respectively (kindly refer Sr. No. 1 &2 of above Table No.13).

2.1.2 Operational difficulties:

(1) Mahalaxmi RSS T/F. No. 1:

(i) On 26.11.2022 there was Oil Leakage from top plate of OLTC, same is attended by tightening nut bolts.

(ii) On 26.11.2022, the studs of top plate of OLTC are worn out, same is replaced.

Mahalaxmi RSS T/F. No. 3:

On 26.11.2022, during overhauling it is observed that oil leakage from top plate of main tank, same is attended by providing packing and tightening nut bolts.

2.1.3 The Mahalaxmi RSS is located at the junction of Jacob Circle, Sat Rasta. In Mahalaxmi, Jacob circle area, development projects were coming up on closed Mill Land and therefore, there has been rise in demand of power. These projects comprise of luxurious towers, shopping malls and hotels having huge load demand. RSS catering load to these areas fed from TPC's RS at Mahalaxmi through our various RSS. Most of the developers are reluctant to spare space for commission of RSS. Moreover, in such places New RSS were hard to come due to space constraint, so, at these places we can meet load only by 33kV changeover. Also, due to space constraints, there is competition between TPC (D) and BEST for attracting consumer. Therefore, for meeting the additional load requirement, the existing capacity of 22/11 kV. 10/12.5 MVA T/Fs are required to be augmented with 33/11 kV, 16 MVA T/FS. The said RSS is highly loaded & further loading would result in lower reliability of supply, flexibility of network & our reliability indices.

2.1.4 Nair Hospital and 110 kV DBA RSS is in the vicinity of Mahalaxmi RSS. The 110 kV DBA RSS is located at Ambika Mill Compound, opposite side of western railway line. For establishing 11 kV network between Mahalaxmi RSS & 110 kV, DBA RSS, the permission from western railway authority is required to be obtained for laying 11 kV cables below railway track. But it is very difficult task and economically not viable. Because, for laying cable under the railway track, 'Heavy Way Leave' charges are required to be paid to the railway authority, which will increase the capital expenditure and resulting increase the tariff.

2.1.5 Peak load of Nair Hospital RSS: It is given in the following table

Table: 17: Peak Load (Last 5 Year) of Nair Hospital:-

RSS Name	Tr. No.	Peak Load														
		2018-19			2019-20			2020-21			2021-22			2022-23		
		AMP	MVA	%	AMP	MVA	%	AMP	MVA	%	AMP	MVA	%	AMP	MVA	%
NH	1		7.66	**48**		6.97	**44**		6.63	**41**		7.77	**49**	140	8.00	**50**
NH	2		8.57	**54**		7.26	**45**		5.72	**36**		760	**48**	124	7.09	**44**

2.1.6 The Nair Hospital RSS is equipped with 33/11 kV, 2X16 MVA T/Fs and loading of T/Fs for last 5 years is given in the above Table No. 15. From the above table it indicates that both T/Fs at Nair Hospital RSS are about 50%loaded.

2.1.7 Further to this, from the consumers at Mahalaxmi and Sat Rasta area about 66 requisitions are received having Load requirement of about 34 MW. To fulfil total load requirement of (about 34 MW BEST has proposed to replace all 2x10/12.5 MVA, 22/11 kV T/Fs with 16/20 MVA, 33/11 kV at Mahalaxmi RSS. Further to this, for meeting that much amount of load, space for new RSS at New Dhobigh at is finalized and we are waiting for the approval of CFO for taking over of the site. ***For copy of requisitions, kindly refer Annexure-L, pg.1-4.***

2.1.8 For releasing the load, spare capacity at Nair Hospital RSS is also to be utilized. After replacement of T/Fs at Mahalaxmi RSS, 12 MVA spare capacities will be available for releasing the load.

2.1.9 Vide MERC Letter Reference No. MERC/TECH V/CAP/DPR/20122013/02688 dated 22.02.2013 in-principle approval of the Hon'ble commission was already obtained for "Revamping of Existing RSS at Mahalaxmi (2 Nos.)". ***For copy of the approval, kindly refers, Annexure-K, Pg. No. 1 to 4 of 20.***

2.1.10 In view of above and considering the large amount of load to be released, it is proposed to replace 22/11 kV, 2X10/12.5 MVA T/Fs with 33/11 kV, and 2X16 MVA T/Fs at Mahalaxmi RSS.

2.2 Justification for replacement of T/F at Sewree and KEM Hospital RSS:

2.2.1 Life of T/Fs: The existing Sewree T/F No. 1 & 3 and KEM T/F 1 had been completed their useful life of 25 years by giving service of 31, 32 and 31 years respectively (kindly refer Sr. No. 6, 7&9 of above Table No.13).

2.2.2 Operational difficulties:

1. **Sewree RSS T/F No.3**: On 09.08.2023, it was tripped on REF, DIFF and Buchholz relay; also, oil came from explosion vent. T/F becomes faulty. **T/F replacement work under RDSS is in progress**.

2. **Sewree RSS T/F No. 1**:On 18.11.2021 and 03.05.2022, there is oil leakage problem from top plate, same is attended by providing packing & tightening nut bolts.
3. **KEM RSS T/F. No. 1:** On 06.04.2019, there is Oil Leakage from LVDB top plate of OLTC, same is attended by tightening nut bolts.

2.2.3 The Sewree RSS is located at Sewree Bus Terminus, near Sewree Railway Station and the KEM RSS is located inside the KEM Hospital premises. The Sewree T/F 1 & 3 and KEM T/F 1 are loaded up to 64 %, 76% & 56% respectively. Contingency point of view, it is not advisable to put further load on these T/Fs. Kindly refer above Table No. 14.

2.2.4 From the consumers of nearby KEM area and Sewree area 18 Nos. and 78 Nos. of requisitions are received having load requirement of 4.32 MW (4.36 MVA, 0.99 PF) and 13.56 MW (13.70 MVA, 0.99 PF) respectively. Most of the developers are reluctant to spare some space for commission of RSS. Moreover, New RSS were also hard to come due to space constraint, we could meet load only by 33kV changeover. For commissioning of new RSS, capital cost on civil structure is required to be made. Also, due to space constraints, there is competition between TPC (D) and BEST for attracting consumer. Therefore, for meeting the load requirement, the existing capacity of 22/11 kV. 10/12.5 MVA T/Fs are required to be augmented with 33/11 kV, 16 MVA T/FS. ***For copy of requisitions, kindly refer Annexure-L, pg.5 of 13 & Annexure-L, 6 to 9 of 13.***

2.2.5 Releasing that much amount of load, sufficient spare capacity i.e. 12 MVA at each RSS will be made available by replacing 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at both RSS.

2.2.6 Also, vide MERC Letter Reference No. MERC/CAPEX/2017-18/4706 dated 16.11.2017 in-principle approval of the Hon'ble commission was obtained for "Revamping of Existing RSS at Sewree RSS (2 Nos.)". ***For copy of the approval, kindly refers, Annexure-K, Pg. No. 5 to 9 of 20.***

2.2.7 In view of above, to meet the additional load requirement from the nearby area, it is proposed to replace 22/11 kV, 3X10/12.5 MVA T/Fs with 33/11 kV, and 3X16 MVA T/Fs at Sewree & KEM RSS.

2.3 Justification for replacement of T/F at Kussara and Mazgaon Dock RSS

2.3.1 **Life of T/Fs:** The existing Kussara T/F No. 2 and Mazgaon Dock T/F 1 & 2 had been completed their useful life of 25 years by giving service of 32, 34 and 38 years respectively (kindly refer Sr. No. 8,4&5 of above Table No.13).

2.3.2 **Operational difficulties**:

1. **Kussara RSS T/F. No. 2**: On 16.03.2022 there is Oil Leakage from OLTC Gear. The oil seal of OTGA assembly is replaced.
2. **Mazgaon Dock RSS T/F. No. 1**:

   On 27.11.2022 oil leakage through coupling of explosion vent pipe and LVDB. Same is attended by providing packing and tightening nut bolts.
3. **Mazgaon Dock RSS T/F. No. 2**:

   (i) On 25.11.2021 T/F Tripped on REF, after investigation nothing found abnormal.

   (ii) On 03.06.2021Oil leakage from explosion vent level indicator and explosion vent is found corroded. Same is temporary attended.

2.3.3 The Kussara RSS is located in front of Al cock Ashdown, near Mazgaon Dock and Mazgaon Dock RSS is located inside the premises of Mazgaon Dock. Kussara T/F No. 2 is 88% loaded and Mazgaon T/F No, 1 & 2 are 73% & 76% loaded.

2.3.4 From the consumers of nearby area, 20 Nos. of requisitions are received having load requirement of 4.40 MW (4.44 MVA, 0.99 PF). Most of the developers are reluctant to spare some space for commission of RSS. Moreover, New RSS were also hard to come due to space constraint in Mumbai city, so, we can meet load requirement only by 33kV changeover. Also, due to space constraints, there is competition between TPC (D) and BEST for attracting consumer. Therefore, for meeting the load requirement, the existing capacity of 22/11 kV. 10/12.5 MVA T/Fs are required to be augmented with 33/11 kV, 16 MVA T/FS. ***For copy of requisitions, kindly refer Annexure-L, pg.10 of 13.***

2.3.5 Releasing that much amount of load, sufficient spare capacity i.e. 6 MVA at Kussara and 12 MVA at Mazgaon Dock RSS will be made available by replacing 22/11 kV, 3X10/12.5 MVA T/Fs with 33/11 kV, 3X16 MVA T/Fs at both RSS.

2.3.6 Vide MERC Letter Reference No. MERC/TECH V/CAP/DPR/20122013/02688 dated 22.02.2013 in-principle approval of the Hon'ble commission was already obtained for "Revamping of Existing RSS at Kussara (2 Nos.) and Mazgaon Dock (1 No.)". ***For copy of the approval, kindly refers, Annexure-K, Pg. No. 1 to 4 of 20.***

2.3.7 In view of above, it is proposed to replace 22/11 kV, 3X10/12.5 MVA T/Fs with 33/11 kV, and 3X16 MVA T/Fs at Sewree & KEM RSS.

2.4 Justification for replacement of T/F at Sitaladevi RSS

2.4.1 Life of T/F: The existing Sitaladevi T/F No. 4 had been completed their useful life of 25 years by giving service of 39 years. (Kindly refer Sr. No. 3 of above Table No.13).

2.4.2 Operational difficulties:

Sitaladevi RSS T/F. No. 4:

On 04.12.2006; there was Oil Leakage from LVDB and on 22.02.2022; there was Oil leakage from LVDB. The Oil leakage was attended by replacing gaskets/packing.

2.4.3 Sitaladevi RSS is located near Sitaladevi Temple & Hinduja Hospital in Mahim area. The existing RSS is equipped with 4 T/Fs and as an average all T/Fs are about 50% loaded.

2.4.4 From the consumers of Sitaladevi area, 58 Nos. of requisitions are received having load requirement of 7.25 MW (7.32 MVA, 0.99 PF). Most of the developers are reluctant to spare some space for commission of RSS. Moreover, New RSS were also hard to come due to space constraint in Mumbai city, so we can meet load only by 33kV changeover. Also, due to space constraints, there is competition between TPC (D) and BEST for attracting consumer. Therefore, for meeting the load requirement, the existing capacity of 22/11 kV. 10/12.5 MVA T/Fs are required to be augmented with 33/11 kV, 16 MVA T/FS. ***For copy of requisitions, kindly refer Annexure-L, pg.11 to 13of 13.***

2.4.5 Releasing that much amount of load, sufficient spare capacity i.e. 6 MVA at Sitaladevi RSS will be made available by replacing 22/11 kV, 1X10/12.5 MVA T/Fs with 33/11 kV, 1X16 MVA T/Fs at RSS.

2.4.6 In view of above, it is proposed to replace 22/11 kV, 1X10/12.5 MVA T/Fs with 33/11 kV, and 1X16 MVA T/Fs at Sewree & KEM RSS.

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2.5 Justification for replacement of T/F at Naval Dock RSS

2.5.1 **Life of T/Fs:** The existing Naval Dock T/F No. 1 & 2 had been completed their useful life of 25 years by giving service of 38 years by each T/F. (Kindly refer Sr. No. 10 & 11of above Table No.13).

2.5.2 Naval Dock RSS is located inside the naval premises. The existing RSS is equipped with 3 T/Fs and as an average all T/Fs are about 40% loaded.

2.5.3 Operational difficulties:

1. **Naval Dock RSS T/F No.1**:

   On 27.02.2015 at, the Tap Position of OLTC was not operational. On investigation found that the shearing pin of declutching mechanism in the OLTC mechanism had broken. The complaint is attended by replacing pin.

2. Naval Dock RSS T/F No.2:

(i) On 21.03.2012 at Naval Dock RSS T/F No. 2 had tripped on buchholz relay. Tripping investigation was carried out; it is found that one of the jumpers in the tank connecting the transformer stamping and the body near the LV diving box was found to be burnt and broken, same is replaced. Further the mercury switch in the buchholz relay was found to be stuck up and damaged same is also replaced. The Conservator was cleaned. Oil temperature indicator was found to be very old and the same is also replaced. Complete oil of the transformer is filtered.

(ii) On 07.05.2012,there was Oil leakage from HVDB; same is attended by replacing packing of all the HV bushings.

(iii) On 24 to 26.03.2014 oil leakage from HVDB dis-connector, same is attended by replacing gaskets.

(iv) On 13.03.2015,there was problem in OLTC mechanism of T/F No.2, the locking pin had broken due to which the tap used to get stuck in between to taps. The complaint was attended by replacing the complete gear mechanism.

(v) On 25.09.2019, 01.10.2021 and 01.12.2021 at Naval Dock RSS during routine partial discharge measurement activity, we observed partial discharge in 22 kV cable at HVDB. After investigation it was observed that the cable termination becomes faulty, same is attended.

(vi) On 14.08.2020 OLTC was not working. After inspection it is found that motor is burnt, same is attended by replacing burnt motor.

2.5.4 In view of this, it is proposed to replace 22/11 kV, 1X10/12.5 MVA T/Fs with 33/11 kV, and 1X16 MVA T/Fs at Sewree & KEM RSS.

4. Technical justification for replacement of T/Fs at Apollo (3 Nos.), Hutatma Chowk (3 Nos.) and Mahim RSS:

3.1 **Life of T/Fs**: (i) The existing Apollo T/F No. 1, 2 and 3 had been completed their useful life of 25 years by giving service of 35 years by each T/F. (Kindly refer Sr. No. 12,13 & 14 of above Table No.13). (ii) The existing Hutatma Chowk T/F No. 1, 2 and 3 had been completed their useful life of 25 years by giving service of 34 years by each T/F. (Kindly refer Sr. No. 15, 16& 17 of above Table No.13) and (iii) The existing Mahim T/F No. 1 had been completed their useful life of 25 years by giving service of 30 years by each T/F. (Kindly refer Sr. No. 18 of above Table No.13)

3.2 **Operational difficulties**:

(1) Apollo T/F No.1:

(i) In June 2013, T/F No. 1 was tripped on buchholz relay. After inspection it is observed that gas trapped in buchholz relay and pipe between LVDB and conservator tank abnormal hot. After Lowering the oil from transformer main tank, opened the inspection chamber on main tank near LVDB. It was observed that 'R' phase flexible copper jumper between LV main tank bushing and transformer secondary side winding was badly burnt. Also earthing jumper between transformer core and main tank was broken. Same jumpers fabricated at Kussara workshop and reconnected. At Apollo RSS, faulty MOG of T/FNo. 1 replaced.

(ii) On 04.10.2022, low voltage complaint was received. After inspection it is observed that Y-phase jumper contact burnt, melted and get separated from bushing rod inside main tank. As stamped "C" shaped busbar and bushing copper rod of matching size was fabricated at Kussara workshop and installed on T/F. T/F complaint is attended.

(ii) On 16.06.2019 MOG replaced.

(iv) On 26.05.2012 there was oil leakage from HVDB, same is attended by replacing the packing of all 3 HV bushings.

(2)Apollo T/F No.2:

On Sept 2021, there was oil leakage from Top Plate and bushings. Same is attended by providing packing.

(3) Apollo T/F No.3:

(i) On Feb 2012 at Apollo RSS there was oil leakage from LVDB of T/F No. 3, same is attended by replacing gasket.

(ii) On21.03.2014 at Apollo RSS T/F No.3 there was oil leakage from OSR and same complaint is attended by replacing gaskets.

(iii) On 16.05.2014 at Apollo RSS T/F No.3 there was oil leakage from OSR terminal bushing and same is attended by replacing OSR.

(v) On 18.08.2019 at Apollo RSS, during P. D. measurement, B phase Raychem termination tube inside HVDB of T/F No. 3 observed torn out completely. Same is attended.

(4) Hutatma Chowk T/F No.1:

On 23.04.2007, there was a 33kV cable termination flashover in H.V dividing box. All 3 Nos. of 33kV bushings got damaged, same replaced and complaint is attended.

(5) Hutatma Chowk RSS T/F No. 2:

(i) On 10.02.2011,T/F No. 2 was tripped on buchholz relay. After inspection it is observed that in HVDB, R- phase bushing had developed crack due to which there was heavy oil leakage. Bushing of R-phase and Air release plugs of other two bushings were replaced.

(ii) Sept 2011 at Hutatma Chowk RSS there was minor oil leakage from the HVDB. On inspection it was observed that the oil leakage was from R-phase bushing flange. Same is attended by tightening R-phase flange nut.

(iii) Nov 2011 at Hutatma Chowk RSS there was oil leakage from OLTC mechanism of T/F No. 2. The leakage was attended by replacing oil tight gland in the OLTC.

(iv) On 30.11.2013 at Hutatma Chowk RSS T/F No.2 oil leakage from main tank oil level indicator, same is attended.

(6) Hutatma Chowk RSS T/F No. 3:

(i) On 04.05.2013 at Hutatma Chowk RSS T/F No.3 there was oil leakage at oil level indicator on main tank of T/F, same attended by replacing gasket. Also oil leakage at HVDB, same was attended by applying steel putty from inside and outside HVDB collar.

(ii) On 04.01.2014 at Hutatma Chowk RSS T/F No.3 while overhauling of OLTC, it is observed that 'B' phase transient resistance body found cracked, same is replaced.

(iii)In May, 2015 OLTC of T/F No. 3 had got stuck on 6 No. tap position. On inspection of OLTC it was noticed that the retaining pin of transition contact of R-phase had got detached and was obstructing the movement of the tap changer. Also all 3 phase transient resistances were broken. The moving contact of R-phase was completely replaced and all the 3 phase transient resistances were reconnected.

(iv) On 17.10.2015 at Hutatma Chowk RSS,AVR of T/F No.3 was showing erratic position of tap of OLTC. Tap position indicator in the OLTC mechanism was found to be defective. Same is attended by replacing tap position indicator.

(v) On 12.04.2022 at Hutatma Chowk RSS, T/F No. 3, there was partial discharge from HVDB and same is attended by making new termination.

(7) Mahim T/F No.1:

(i) On 01.01.2020 Oil leakage was observed from top plate of T/F, LV bushings and Heavy oil leakage from HVDB. Same is attended.

(ii) On 07.01.2022 Oil leakage was LV bushings and same is attended by tightening the nut bolts.

(iii) On 13.02.2023 Oil leakage was LV & HV bushings and top plate of T/F and also minor oil leakage from OLTC drive shaft, same is attended.

3.3 Location of RSS:

(i) Apollo RSS is located near Stock Exchange/RBI. It is equipped with 33/11 kV, 3X15 MVA Kirloskar Make T/Fs installed in 1988.

(ii) Hutatma Chowk RSS is located in Hutatma Chowk. It is equipped with 33/11 kV, 3X15 MVA Bharat Bijalee Make T/Fs installed in 1989.

(iii) Mahim RSS is located near Shivsena Bhavan. 33/11 kV, 3X16 MVA Voltas Make T/F No. 1 installed in 1993.

3.4 The T/Fs installed at Apollo and Hutatma Chowk RSS supplies power to the VIP consumers such as RBI, Stock Exchange, Mint, High Court, National & Multinational Banks, etc.

3.5 Considering the VIP area and life of these T/Fs, it is proposed to replace 33/11 kV, 7X15/16 MVA T/Fs with 33/11 kV, 7X16 MVA T/Fs. BEST is now not procuring 15 MVA T/Fs, and hence it is proposed to replace with 16 MVA T/Fs.

5. Costing of T/Fs under Replacement (18 Nos.)

4.1 Supply Installation and Commissioning (Dismantling & Replacing) of Existing Transformers-(10/12.5 MVA with 16 MVA and 15 MVA with 16 MVA), ***for SLD kindly refer, Annexure-K, Pg. No. 10 to 20.***

Table 18: Cost Sheet of T/Fs under Replacement (18 Nos.)

Sr. No.	Description	Qty	Unit	Basic Rate Supply (in Rs)`	Basic Rate Supply with GST (in Rs)`	Basic Rate Erection (in Rs)`	Basic Rate Erection with GST (in Rs)`	Total Cost
A	B	C	D	E	F=1.18*E	G	H=1.18*G	I = C*(F+H)
1	Mazgaon D	2	No	17543337.18	20701137.87	5847779.00	69,00,379.22	5,52,03,034.19
2	Sewree	2	No	17543337.18	20701137.87	5847779.00	69,00,379.22	5,52,03,034.19
3	Mahalaxmi	2	No	17543337.18	20701137.87	5847779.00	69,00,379.22	5,52,03,034.19
4	Sitaladevi	1	No	17543337.18	20701137.87	5847779.00	69,00,379.22	2,76,01,517.16
5	KEM	1	No	17543337.18	20701137.87	5847779.00	69,00,379.22	2,76,01,517.16
6.	Kussara	1	No	17543337.18	20701137.87	5847779.00	69,00,379.22	2,76,01,517.16
7.	Naval Dock	2	No.	20429226.97	20701137.87	3605157.70	42,54,086.09	5,67,21,147.82
8.	Apollo	3	No	17543337.18	20701137.87	5847779.00	69,00,379.22	8,28,04,551.27
9.	Hutatma C	3	No	17543337.18	20701137.87	5847779.00	69,00,379.22	8,28,04,551.27
10.	Mahim	1	No	17543337.18	20701137.87	5847779.00	69,00,379.22	2,76,01,517.16
	TOTAL	**18**		**178319261.59**	**210416728.68**	**56235169.24**	**66357499.70**	**498345422.43**

4.2 **Cost Justification for least cost option**: -Tender was invited for replacement of 18 Nos. of T/Fs at above mentioned locations/ RSS. Subsequently, contract is awarded to LoA, M/s. Tata Power Co. Ltd. ***For copy of P.O, kindly refer Annexure H, Pg. No.9 to 25 of 68.***

(C) **Replacement of 18 Nos. of 33 kV, 1500 MVA switchgears at existing RSS viz. Mazgaon Dock (1), Mumbadevi (2), Mahim (2), Masjid (1), KEM Hospital (1), Nair Hospital (1), Kingsway (2) Apollo (1), Prabhadevi (2), Nestle (1), Ballard Estate (3)& Colaba (1).**

1. Details of 33 kV, 1500 MVA Primary switchgears are given in the following table:

Table 19: Details of 33 kV, 1500 MVA Switchgears

SR. NO.	NAME OF RSS	T/F NO.	MAKE OF SWITCHGEAR	YEAR OF MFG.	SERVICE LIFE (YEARS)
1	Mazgaon Dock	1	Voltas	1984	39
2	Mumbadevi	2	Voltas	1990	33
3	Mumbadevi	3	Voltas	1996	27
4	Ballard Estate	1	Voltas	1995	28
5	Ballard Estate	2	Voltas	1995	28
6	Ballard Estate	3	Voltas	1995	28
7	Mahim	2	Voltas	1995	28
8	Mahim	1	Voltas	1996	27

SR. NO.	NAME OF RSS	T/F NO.	MAKE OF SWITCHGEAR	YEAR OF MFG.	SERVICE LIFE (YEARS)
9	Masjid	3	Voltas	1996	27
10	KEM	1	Voltas	1997	26
11	Colaba	1	Voltas	1997	26
12	Kingsway	1	Voltas	1998	25
13	Kingsway	2	Voltas	1998	25
14	Nair Hospital	1	ABB	1998	25
15	Apollo	4	Voltas	1999	24
16	Prabhadevi	1	Voltas	2000	23
17	Prabhadevi	2	Voltas	2000	23
18	Nestle	1	Voltas	2001	22

2. **Need of replacement of above switchgears**:

2.1 **Life of switchgears**: All the existing33 kV, 1500 MVA primary, Voltas Make SF6 switchgears & ABB Make switchgear (Sr. No.14) mentioned in above Table No. 17, (Sr. No. 1 to 14) has been manufactured prior to 1998 and these switchgear has been completed their useful service life of 25 years. The switchgears installed at Apollo, Prabhadevi and Nestle RSS has completed useful service life of 24, 23 & 22 years respectively.

2.2 **Operational difficulties**:

(1)Mazgaon Dock RSS 33 kV Primary switchgear of T/F No.1: Jumper locking mechanism of 33 kV Primary switchgear found loosened. Also, doors of switchgears not closed because of broken mechanism. Same is attended.

(2) **Mumbadevi RSS, 33 kV Primary switchgear T/F No.2**: Primary Breaker Arm main contacts alignment not engaging properly. Same is attended.

(3) **Ballard Estate RSS, T/F No.1**:

(i) On 14 & 15.04.2014primary breaker could not SW/ OFF electrically and mechanically. The complaint is attended by adjusting cam and lever assembly of spring charging limit switch.

(ii) On 06.12.2014 there was primary breaker spring charging complaint, same is attended by adjusting spring charging lever mechanism.

(4) **Ballard Estate RSS, T/F No.2**: On 13.11.2014primary breaker SF6 low indication occurred. After investigation it was observed that Y phase SF6 interrupter pole pressure switch operated. Same pole is replaced.

(5) **Ballard Estate RSS, T/F No.3**: On 5.06.2015 there was hissing noise from primary breaker. On inspection it was found that there were minor discharge marks on outgoing T/F cable. Cable end compartment completely cleaned and additional heater provided in the cable end compartment.

(6) Mahim RSS, 33 kV Primary switchgear T/F No. 2:

(i) On 03.01.2020, spring charging mechanism found stuck up; same is attended by applying CRC Spray & grease. Spring charging limit switch found defective, same is replaced.

(ii) On 20.02.2022, spring charging mechanism found stuck up, same is attended by applying CRC Spray & grease. Breaker test and service locking mechanism found dislocated, same is attended by making proper alignment and greasing.

(6) Mahim RSS33 kV Primary switchgear, T/F No. 1:

(i) On 07.07.2019 heavy chattering noise observed from incoming cable compartment. Discharge marks observed on "Y phase incoming cable termination core and all three phase incoming cable spout contact found greenish, same attended by cleaning and applying Anti-Track spray. Spring charging mechanism found stuck up, same attended by applying CRC spray and grease.

(ii) Inspection on 14.10.2019 at primary breaker chattering noise is detected with P.D. instrument. Also, discharge mark observed on "Y" phase incoming cable termination core and minor discharge marks observed on supporting insulator. Same is attended by cleaning and applying Anti-Track spray.

(iii) On 01.01.2020& 20.02.2022 spring charging mechanism found stuck up, same is attended by applying CRC spray and grease. Breaker test and service locking mechanism found dislocated, same is attended by making proper alignment.

(iv) Inspection on 27.08.2022 at primary breaker Chattering noise is detected with P.D. instrument. Also, discharge mark observed on all three phase incoming cable termination core and minor discharge marks observed on supporting insulator. Same is attended by cleaning and applying Anti-Track spray.

(7) Masjid RSS 33 kV Primary switchgear T/F No.1: on 26.06.2021 Indication of ‘Low’SF6 pressure on primary breaker. After inspection it is observed that B- phase Pressure switch terminal found short and same is attended.

(8) KEM Hospital RSS 33 kV Primary switchgear T/F No.1: on 26.06.2021 Indication of ‘Low’SF6 pressure on primary breaker. After inspection it is observed that B- phase Pressure switch terminal found short and same is attended.

(9) Apollo RSS 33 kV Primary switchgear T/F No.4:

In March 2011, there was low SF6 gas pressure indication in primary breaker of T/F No. 4. R-phase SF6 interrupter bottle was found to be discharged, same replaced.

(10) Prabhadevi RSS 33 kV Primary Switchgear T/F No.1:

(i) On 13.11.2020 spring charging mechanism found jammed, same is attended by applying CRC spray and grease. Discharge marks observed on supporting insulator in incoming cable compartment, same is cleaned and & Anti Track spray applied.

(ii) On02.02.2022 & 20.10.2022 it is found that spring charging motor runs continuously. After inspection found that spring charging limit switch mechanism found stuck up, same attended by applying CRC spray and grease.

(11) Prabhadevi RSS 33 kV Primary Switchgear T/F No.2:

(i) On 23.03.2021 spring charging motor runs continuously, as spring charging limit switch mechanism found stuck up. Same is attended by applying CRC spray and grease.

(ii) On 04.12.2021 spring charging mechanism found stuck up, same is attended by applying CRC spray and grease. Breaker test and service locking mechanism found dislocated, same is also attended.

(iii) On 22.02.2023 chattering noise is observed from 33KV incoming cable compartment. Also, discharge marks observed on all three phase supporting insulators and incoming cable spouts. All three phase supporting insulators cleaned and Anti Track spray applied, also incoming cable spout cleaned.

(12) Nestle RSS, 33 kV Primary Switchgear T/F No.1:

(i) On 16.10.2019 flash over occurred on PT of primary breaker, same checked "Y" phase PT found burnt and broken, same is attended.

(ii) On 22.01.2021 spring charging mechanism found stuck up, same attended by applying CRC spray and grease. Breaker test and service locking mechanism found dislocated, same also attended.

(iii) On 02.03.2022 spring charging mechanism found jammed, same is attended by applying CRC spray and grease. Discharge marks observed on supporting insulator in incoming cable compartment, same is cleaned & Anti Track spray applied.

2.3 All the switchgears under replacement are of Voltas Make and the company has stopped production of these switchgears. Hence, our maintenance division is facing problem for maintaining these switchgears, due to non-availability of spares in the market. ***For management sanction, kindly refer Annexure-M, Pg. No. 1&2 of 31.***

2.4 For replacement of following 33 kV, 1500 MVA primary switchgear at various RSS, the Commission's in-principle approval was obtained and details are mentioned in the following Table No. 18. Now, BEST has proposed to replace all these switchgears (mentioned in above Table No. 17) under RDSS. ***For Copy of Approved DPR, kindly refer Annexure M, Pg. No. 7, 13, 14& 19of 31 & for SLD; kindly refer Annexure-M, Pg. No.20 to 31 of 31.***

Table No.20: MERC Approved DPR for Replacement of 33 kV switchgears

Sr. No.	Name of RSS	Qty No.	MERC Approval Details	BEST FY
1	Mumbadevi	2	MERC/TECH V/CAP/DPR/20122013/02688dtd. 22.02.2013	16/02
2	Masjid	3		
3	KEM	1	MERC/CAPEX/2017-18/4706 dtd. 16.11.2017	17/02
4	Ballard Estate	1	MERC/CAPEX/2017-18/4706 dtd. 16.11.2017	18/02
5	Mazgaon Dock	1	MERC/CAPEX/2020-21/553 dtd. 15.12.2021	20/02
6	Mahim	2		
7	Kingsway	2		
8	Colaba	1		

Please kindly note that the schemes shown in the above table will be deleted from the scope of work of these DPRs once approved these schemes under RDSS DPR.

2.5 As per MERC (Electricity Supply of Code and SoP of Distribution Licensees including Power Quality) Regulations, 2021,it is mandatory to all DISCOMS including BEST to provide uninterrupted, reliable, and Quality power supply to all consumers.

2.6 After removal of serviceable spares, replaced 33 kV, Voltas Make primary switchgears will be scraped. Cost recovered from the scrap will be shown as other income in the upcoming MYT/MTR Petition.

2.7Costing of the 33 kV, 1500 MVA switchgears

Table 21: Cost of 33 kV 1500 MVA Switchgear Replacement (18 Nos.)

Sr. No.	Description	Qty	UN I T	Basic Rate Supply (in ₹)`	Basic Rate Supply with GST (in ₹)`	Basic Rate Erection (in ₹)`	Basic Rate Erection with GST (in ₹)`	Total Cost in ₹
A	B	C	D	F	G	H	I	J = C*(G+I)
1	Mazgaon D	1	No.	16,40,446.91	19,35,727.35	5,46,815.64	6,45,242.46	25,80,969.81
2	Mumbadevi	2	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	5161939.618
3	Mahim	2	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	5161939.618
4	Masjid	1	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	25,80,969.81
5	KEM Hosp	1	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	25,80,969.81
6.	Nair Hosp.	1	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	25,80,969.81
7.	Kingsway	2	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	5161939.618
8.	Apollo	1	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	25,80,969.81
9.	Prabhadevi	2	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	5161939.618
10.	Nestle	1	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	25,80,969.81
11.	Ballard Estate	3	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	7742909.427
12.	Colaba	1	No.	16,40,446.91	19,35,727.35	54,68,15.64	6,45,242.46	25,80,969.81
	TOTAL	**18**		**1,96,85,362.92**	**2,32,28,728.25**	**65,61,787.68**	**77,42,909.46**	**4,64,57456.56**

2.7.1 Cost justification: For achieving least cost, P.O is placed on The Tata Power Co. Ltd. for Supply, installation, Commissioning, dismantling/replacement of 33 kV, 1500 MVA Primary Switchgears at above RSS. For P.O copy, kindly, refer Annexure H, Pg. No. 16 & 17.

(D) Replacement of 32 Nos. of 11 kV, 350 MVA switchgears at existing RSS viz. Jyoti Make: Mahim causeway (2), Grant Road (4), Mahalaxmi (1), Prabhadevi (2), Kussara (2), Apollo (2), Siemens Make: Dharavi (2), Sewree (2), Esplanade (3), Mahim (2), Wadala (2), Malbar Hill (2), KEM Hospital (1), Worli (2), Nair Hospital (1) & Mahalaxmi (2)

1. Details of 11kV, 350 MVA secondary switchgears are given in the following table:

Table 22: Details of 11kV, 350 MVA Switchgears

SR. NO.	NAME OF RSS	BUS SECTION	MAKE OF SWITCHGEAR	MANUFACTURING YEAR	SERVICE LIFE (YRS)
1	Mahim causeway	3	Jyoti	1992	31
2	Mahim causeway	4	Jyoti	1992	31
3	Grant Road	1	Jyoti	1994	29
4	Grant Road	2	Jyoti	1994	29
5	Grant Road	3	Jyoti	1994	29
6	Grant Road	4	Jyoti	1994	29
7	Mahalaxmi	1	Jyoti	1999	24
8	Prabhadevi	2	Jyoti	1999	24
9	Prabhadevi	3	Jyoti	1999	24
10	Kussara	1	Jyoti	2000	23
11	Kussara	2	Jyoti	2000	23
12	Apollo	2	Jyoti	2000	23
13	Apollo	3	Jyoti	2000	23
14	Dharavi	1	Siemens	1993	30
15	Dharavi	2	Siemens	1993	30
16	Sewree	2	Siemens	1994	29
17	Sewree	3	Siemens	1994	29
18	Esplanade	1	Siemens	1995	28
19	Esplanade	2	Siemens	1995	28
20	Esplanade	3	Siemens	1995	28
21	Mahim	1	Siemens	1996	27
22	Mahim	2	Siemens	1996	27
23	Wadala	1	Siemens	1996	27
24	Wadala	2	Siemens	1996	27
25	Malabar Hill	2	Siemens	1997	26
26	Malabar Hill	3	Siemens	1997	26
27	KEM Hospital	1	Siemens	1997	26
28	Worli	1	Siemens	1998	25
29	Worli	2	Siemens	1998	25
30	Nair Hospital	1	Siemens	1998	25
31	Mahalaxmi	3	Siemens	1998	25
32	Mahalaxmi	2	Siemens	1999	24

2. Need of replacement of above Jyoti Make Switchgears:

2.1 Life of Jyoti Make switchgears: All the existing 11 kV, 350 MVA Secondary, Jyoti Make SF6 switchgears mentioned in above Table No. 20, (Sr. No. 1 to 6) has been manufactured prior to 1994 and this switchgear has completed more than 29 years of service life. Further to this the switchgears installed at Mahalaxmi (Qty-1) &Prabhadevi (Qty-2) RSS has completed their useful life of 24 years and the switchgears installed at Kussara (2) & Apollo (Qty-2) RSS has completed useful service life of 23 years (Sr. No. 7 to 13.

2.2 Operational difficulties:

1. **Mahim Causeway RSS, 11 kV Bus Section No. 3 & 4:** due to ageing, old type breaker operating mechanism with many mechanical and electrical interlocks having many operational difficulties. Due to ageing also it becomes inoperative/ jammed.

2. **Grant Road RSS B. S. No.1**: G-1.3 feeder breaker 'Rack IN' and 'Rack Out' mechanism problem, same is attended.

3. **Grant Road RSS B. S. No.2**: G-2.4 feeder breaker 'Rack IN' and 'Rack Out' mechanism problem, same is attended.

4. **Grant Road RSS B. S. No.3**: G-3.6 feeder breaker 'Rack IN' and 'Rack Out' mechanism problem attended.
5. **Grant Road RSS B. S. No.4**: feeder breaker G-4.1, G4.3, G4.5 & G4.8 'Rack IN' and 'Rack OUT' mechanism problem attended.

6. **Mahalaxmi RSS 11 kV B. S. No.1**:

   (i) On 21.12.2021 at Bus Coupler 1-2 'ON command 'was become inoperative, same is attended.

   (ii) On 27.08.2021, spring charging motor of ML1.6 feeder breaker at RSS was running continuously, same is attended. On 19.08.2021 at Mahalaxmi RSS, 11 kV B S. No. 3 breaker indications was not working, same is attended. On 02.07.2021 Electrical operations of feeder breaker of ML 3.6 were failed, the driving mechanism repaired and setting adjusted. On 19.10.2020 Secondary breaker arcing through R and B phase busbar end spout, same is attended by Cleaning and Heating.

7. **Mahalaxmi RSS 11 kV B. S. No.2**:

   On 05.08.2022 Bus Coupler 2-3 breaker 'Rack IN' and 'Rack Out' complaint attended by making shutter alignment proper. On 23.11.2020 Spring charging mechanism of BC 2-3 was become inoperative and same is attended. On 16.07.2019 'Rack IN' and 'Rack Out' complaint of feeder breaker ML 2.5 was attended by replacing missing locking clip.

8. **Prabhadevi RSS 11 kV B.S No. 2**:

   (i) On 15.08.2018 PR 2.7 --> Satywadi Annex breaker didn't tripped under fault condition, hence investigation for the same was carried out and it is found that plunger of trip coil found broke down, same is attended by replacing Trip coil with assembly.

   (ii) 16.03.2022 Secondary breaker not locking in service position. After investigation it is found that breaker locking rod found stuck up and same is attended by applying CRC spray and grease.

   (iii) On 22.02.2023 Secondary breaker not locking in service position and spout shutter found jammed, same is attended by applying CRC spray and grease.

9. **Prabhadevi RSS 11 kV B.S No. 3**:

(i) On 19.02.2022 Breaker could not take into service position also breaker not locking in service position. After inspection it is found that spout shutter found jammed, same is attended by applying CRC spray and grease.

(ii) On 17.03.2022 secondary breaker not locking in service position as locking rod found stuck up, same is attended by applying CRC spray and grease.

(iii) On 23.03.2023 breaker could not taken into service position also breaker not locking in service position. It is found that shutter is jammed; same is attended by**.**

10. **Kussara RSS 11 kV B. S. No.1**:

(i) On 31.07.2023 at RSS end K1.3 feeder breaker could not electrically Switch ON/Switch OFF, same complaint is attended.

(ii) On 05.08.2019 spring charging motor of K1.4 feeder breaker was running continuously, same is attended. Also, latching mechanism spring replaced.

(iii) On 09.08.2019 it was found that spring charging motor of K1.6 feeder breaker continuously running, same is attended. Latching mechanism spring replaced.

11. **Kussara RSS 11 kV B. S. No.2**:

(i) On 09.01.2022 feeder breaker K2.7 could not trip, hence, tripping coil mechanism alignment made proper and complaint attended.

(ii) On 01.01.2021 it is found that spring charging motor of K2.6 feeder breaker was continuously running, same was attended. Needle bearing replaced.

(iii)On 24.11.2020 Secondary Breaker becomes inoperative same is attended by replacing relay.

(iv)On 15.06.2020 locking mechanism of feeder breaker K2.1 found sluggish, same is attended.

(v) On 28.01.2020 Spring charging mechanism of feeder breaker K2.2 was not operated, same is attended by replacing latching mechanism spring.

12. **Apollo RSS, B. S. No. 2**:

(i) On 05.12.2014 bus-bar flashover occurred in A2.2 breaker. After inspection found that Y and B phase bus-bar end spouts were found to be burned off and damaged. Same were replaced. Also cable end spouts of A2.2 replaced.

(ii) On 18.08.2020 BC 1-2 could not Sw/In. After inspection it is found that closing coil plunger locking support was dismantled and fallen down. Same re-fixed.

(iii) On 14.05.2022 feeder breaker AP 2.1 could not Sw/In, same is attended by making proper alignment of breaker locking mechanism.

(iv) On 06.06.2021 it is observed that there is P.D on Secondary Breaker and R & Y Phase Contact Strips of vacuum interrupter were found oxidised. Complaint is attended by cleaning with CRC Spray.

13. **Apollo RSS, B. S. No. 3**:

(i) On 31.05.2022 there was Partial discharge at B-C inter connector, same is attended by applying CRC spray and grease.

(ii) On 01.01.2022 there was wrong indication problem on secondary breaker, same is attended by replacing relay.

(iii) On 19.06.2022 there was partial discharge in bus B. S. 3; same is attended by cleaning of all three phase busbars, spouts and insulators.

14. **Sewree RSS 11 kV B. S. No.2:**

(i)On 13.10.2022 & 30.01.2023 feeder breaker of SW2.6 latching complaint and shutter mechanism was jammed, same is attended.

(ii) On 04.09.2022 Low IR value of feeder breaker SW2.6 was attended.

15. **Sewree RSS 11 kV B. S. No.3:**On 14.03.2021 Shutter mechanism trolley of SW 3.3 was jammed, same is attended.
16. **Esplanade RSS 11 kV B.S. No.**1: Feeder breaker E-1.1 'R' phase bottle high contact resistance and same is attended by replacing R-Phase bottle.
17. **Esplanade RSS 11 kV B.S. No.2:** Secondary breaker shutter mechanism worn out due to ageing. Also ‘Rack IN & Rack OUT’ mechanism problem, same is attended. Feeder breaker E2.1 trip coil plunger jammed, same attended by applying CRC spray & grease.
18. **Esplanade RSS 11 kV B.S. No.3:** Feeder breaker E-3.7 'R' phase bottle supporting insulator found crack, same is replaced. Feeder breaker E-3.2 motor becomes faulty, same is replaced. Feeder breakerE3.6Y Phase contact burnt, burnt contact replaced. Feeder breaker E3.1B-phase spout low IR value, same is attended by cleaning.

19. **Mahim RSS B. S. No.1**:

(i) On 22.11.2017 MM 1.4 --> Pinto Villa breaker key locking shutter mechanism found jammed, same is attended by applying CRC &grease.

(ii) On 24.01.2018 chattering noise observed from secondary breaker. It is observed that "B" phase PT contact found misalignment. Same is attended by making proper alignment.

(iii) On 19.02.2019 "B" Phase PT voltage not getting on relay of secondary breaker. Same is attended by making proper alignment of PT.

20. **Mahim RSS B. S. No.2**:

(i) On 12.11.2017 heavy Ozone smell & chattering noise observed from MM 2.3 breaker, same is attended by cleaning breaker housing and completer bus bar. Also, discharge marks observed on all three busbar and spouts. Same is attended by replacing busbar end spout.

(ii) On 23.10.2018 MM 2.7 --> Grand Pallazo DSS breaker discrepancy switch found faulty, same is attended by replacing switch.

(iii) MM 2.2 --> Capacitor no.2 breaker could not take into service position due to spout shutter stuck up, same is attended.

21. **Malbar Hill RSS B.S. No.2**: MH-2.1& MH2.2feeder breaker key latching problem, same is attended by making proper alignment. 3) T/F No.2 Secondary .breaker shutter mechanism worn out due to ageing, same is attended by cleaning.

22. **Malbar Hill RSS B.S. No.3**: MH-3.1 & MH3.2 feeder breaker latching problem, same is attended by making proper alignment.

23. **KEM RSS B.S. No.1**:

(i) On 04.12.2021 B.C1-2 'OFF command' was not operative, breaker was blocked, and same complaint is attended.

(ii) On 07.06.2021 feeder breaker KEM 1.7 stuck at test position, same is attended by making proper alignment.

24. **Nair Hospital RSS B.S. No.1:**

(i) On 08.11.2021 at spring charging motor of feeder breaker NH 1.5 was not working and same is replaced.
(ii) On 27.05.2021 door locking problem of feeder breaker NH 1.5 was attended by cleaning.

25. **Worli RSS, 11 kV B. S. No. 1**:

(i) On 19.08.2018W1.2 --> Capacitor No.1, breaker isolating mechanism found stuck up, same is attended by applying CRC and grease.

(ii) On 05.07.2018 Worli 1.6 --> Dhanraj Estate No.2 breaker trip circuit faulty indication observed. After inspection it is observed that wire in TB and in breaker plug found open, same reconnected.

26. **Worli RSS, 11 kV B. S. No. 2**:

(i) On 11.11.2017 W2.7 --> Shivsagar South, breaker found stuck up in breaker service and isolate position. Breaker locking mechanism also found jammed. Same is attended by applying CRC and grease.

(ii) On 31.01.2019 W2.6 breaker key shutter found jammed. Same is attended by applying CRC and grease.
(iii) On 19.04.2019 W2.4 --> Apte Industries key shutter mechanism found locked, same is attended by applying CRC and grease.
(iv) On 17.08.2019 Secondary breaker of T/F No.2, key shutter mechanism found locked, same is attended by applying CRC and grease.

2.2.1 The switchgears mentioned in above table at Sr. No. 1 to 13 are of Jyoti Make. O&M Dept. is facing problems in maintaining these outdated Jyoti Make switchgears as the switchgear model has become obsolete. Also, the firm has stopped manufacturing of the switchgear model. Therefore, spares of these models are not available in the market.

2.2.2 In view of this, it is proposed to replace all 13 Nos. of 11 kV, 350 MVA switchgears mention at Sr. No. 1 to 13 in above table. ***For Jyoti Make switchgears, kindly refer Annexure- N, Pg. No. 1 & 2 of 24***.

2.3 The switchgears mentioned at Sr. No. 14 to 32 are of Siemens make. M/s. Siemens vide their letter dated 31.07.2008 has informed that due to the up-gradation in switchgear technology, manufacturing of above said VCB were discontinued and new product were taken up for manufacturing. However, spares of these breakers were also discontinued. Hence, O&M Department is facing problems for maintaining Siemens Make switchgears, as the spare are not available in the market. **For copy of management approval letter &Siemens letter, kindly refer Annexure-N, Pg. No. 3 to 8 of 24 and for SLD, kindly refer Annexure-N, Pg. No. 9 to 24 of 24.**

2.4 For replacement of 11 kV, 350 MVA Secondary Switchgears at various RSS, the Commission's in-principle approval was obtained and details are mentioned in the following Table No. 21. Now, BEST has proposed to replace all these switchgears under RDSS. For Copy of Approved DPR, kindly refer Annexure-M, 13, 14 & 19.

Table 23: MERC Approval for replacement of 11 kV, 350 MVA Bus Sections

Sr. No.	Name of RSS	Qty No.	MERC Approval Details	BEST FY
1	Mahim C'way	2	MERC/CAPEX/2017-18/4706 dtd. 16.11.2017	17/02
2	Esplanade	3		
3	Malabar Hill	1	MERC/CAPEX/2017-18/4706 dtd. 16.11.2017	18/02
4	Grant Road	4	MERC/CAPEX/2020-21/553 dtd. 15.12.2021	20/02
5	Sewree	2		
6	Dharavi	2		
7	Wadala	2		
8	Mahim	2		
9	Prabhadevi	2		
10	KEM Hosp	1		
11	Worli	2		
12	Mahalaxmi	3		
13	Nair Hosp	1		

Please kindly note that the schemes shown in the above table will be deleted from the scope of work of these DPRs once approved these schemes under this RDSS DPR.

2.4.1 As per MERC (Electricity Supply of Code and SoP of Distribution Licensees including Power Quality) Regulations, 2021,it is mandatory to all DISCOMS including BEST to provide uninterrupted, reliable, and Quality power supply to all consumers.

2.4.2 After removal of serviceable spares, existing all Jyoti & Siemens Make bus sections will be scrapped. Cost recovered from the scrap will be shown as other income in the next MYT /MTR Petition.

2.4.3 In view of above, the Hon'ble commission's in-principle approval is requested for replacement of all mentioned above (Table No.20) 11 kV,350 MVA Bus Sections under RDSS.

2.4.4 Cost Sheet of 11 kV Bus Sections

Table 24: Cost Sheet of the 11 kV, 350 MVA Secondary Switchgears

SR. NO.	PARTICULARS	Qty.	UNIT	BASIC RATE SUPPLY (in ₹)	BASIC RATE SUPPLY WITH GST (in ₹)	BASIC RATE ERECTION (IN ₹)	BASIC RATE ERECTION WITH GST (in ₹)	TOTAL (SUPPLY + ERECTION) WITH GST (in ₹)
A	B	C	D	E	F =1.18*E	G	H=1.18*G	I = C*(F+H)
1	Mahim C'way	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
2	Sewree	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
3	Grant Road	4	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	4,68,78,594.72
4	Esplanade	3	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	3,51,58,946.04
5	Malabar Hill	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
6	Dharavi	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
7	Mahim	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
8	KEM Hospital	1	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	1,17,19,648.68
9	Prabhadevi	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
10	Worli	2	NO.	82,76,588.07	97,66,373.92	27,58,862.69	32,55,457.97	2,60,43,663.79
11	Nair Hospital	1	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	1,17,19,648.68
12	Mahalaxmi	3	NO.	82,76,588.07	97,66,373.92	27,58,862.69	32,55,457.97	3,90,65,495.69
13	Kussara	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
14	Apollo	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
15	Wadala	2	NO.	74,48.929.26	87,89,736.53	24,82,976.40	29,29,912.15	2,34,39,297.36
	TOTAL	**32**		**11,33,89,256.50**	**13,37,99,322.70**	**3,77,96,418.58**	**4,45,99,773.92**	**38,15,39,673.82**

2.4.5 **Cost justification**: For achieving least cost, P.O is placed on The Tata Power Co. Ltd. for Supply, installation, Commissioning, dismantling/replacement of 11kV, 350 MVA Secondary Switchgears at above RSS. ***For P.O copy, kindly refer Annexure-H, Pg. No. 9 to 25 of 68.***

(E) Replacement / Laying of additional 120 km of 33 kV, 3CX300 SQ. MM Cu XLPE Cable:-

- The List of Schemes considered in RDSS is shown in the following table.

Table 25: Details of 33 kV, 3CX300 SQ MM Cu XLPE under replacement

Sr. No.	Particulars	Existing Length (in km)	Proposed Length (in km)	Reduction in Loss (in kW)	Cable Laid (in Yrs) (Cable Life)	Per Year Unit Lost (kwh)	ABR (in ₹)	Prop. Amount to be Saved (in ₹ Cr.)	No. of Faults (in Nos.)	No. of Joints (in Nos.)
A	B	C	D	E	F	G	H	I	J	K
1	TPC Carnac R/S --> Naval Dockyard Tr. 1	3.48	3.48	8.04	1982 (41)	70419.89	7.81	0.05	6	19
2	TPC Carnac R/S --> Naval Dockyard Tr. 2	3.52	3.52	8.13	1982 (41)	71229.31	7.81	0.06	6	20
3	TPC Carnac R/S --> Naval Dockyard Tr. 4	3.49	3.49	8.06	1982 (41)	70622.24	7.81	0.06	13	33
4	TPC Carnac R/S-->Ballard Estate Tr. 1	2.91	2.55	5.89	1967 (56)	51600.78	7.81	0.04	5	17
5	TPC Carnac R/S--> Ballard Estate Tr. 3	2.20	2.20	5.08	1984 (39)	44518.32	7.81	0.03	2	12
6	TPC Carnac R/S ---> Marine Drive Tr. 1	4.13	3.29	7.60	1976 (47)	66534.65	7.81	0.05	14	35
7	TPC Carnac R/S--> Apollo RSS Tr.2	2.80	2.80	6.47	1984 (39)	56659.68	7.81	0.04	8	24
8	TPC Carnac R/S ---> Apollo RSS Tr. 3	3.05	2.98	6.88	1984 (39)	60302.09	7.81	0.05	10	28
9	TPC Carnac R/S-->Hutatma Chowk Tr. 1	2.31	2.31	5.34	1981 (42)	46744.24	7.81	0.04	9	25
10	TPC Carnac R/S-->Hutatma Chowk Tr. 3	2.30	2.30	5.31	1981 (42)	46541.88	7.81	0.04	13	33
11	TPC Carnac R/S--> Colaba Tr. 2	5.47	2.75	6.34	1960 (62)	55566.96	7.81	0.04	10	28
12	TPC Carnac R/S-->G.T. Hospital Tr. 1	1.69	1.69	3.90	1978 (44)	34198.16	7.81	0.03	7	22
13	TPC Carnac R/S--> G.T. Hospital Tr. 2	1.72	1.72	3.97	1986 (37)	34805.23	7.81	0.03	7	21
14	TPC Parel R/S---> Mahalaxmi Tr. 1	1.96	1.96	4.53	1956 (66)	39661.78	7.81	0.03	10	27
15	TPC Parel R/S---> Mahalaxmi Tr. 3	2.25	2.25	5.20	1966 (57)	45530.10	7.81	0.04	10	27
16	TPC Backbay R/S-->Esplanade Tr. 4	3.77	2.08	4.79	1967 (55)	41988.87	7.81	0.03	7	22
17	TPC Backbay RSS-->Hutatma ChowkTr.2	3.19	0.98	2.25	1977 (46)	19729.71	7.81	0.02	12	31
18	TPC Backbay RSS--->Marine Drive Tr. 2	2.02	1.58	3.65	1975 (48)	32012.72	7.81	0.03	5	18
19	Backbay RSS -> Marine Drive Tr. Tr.3	2.02	1.58	3.65	1975 (48)	32012.72	7.81	0.03	5	17
20	TPC Parel R/S---> Futurex Ht RHS	2.25	1.40	3.23	1955 (67)	28329.84	7.81	0.02	9	25
21	TPC Carnac R/S-->Esplanade Tr. 1	1.93	0.43	0.99	1957 (65)	8640.60	7.81	0.01	5	17
22	TPC Carnac R/S-->Esplanade Tr.2	1.65	0.39	0.89	1957 (65)	7831.18	7.81	0.01	8	24
23	TPC Carnac R/S-->Esplanade Tr.3	1.97	0.39	0.89	1957 (65)	7831.18	7.81	0.01	9	26
24	TPC Carnac R/S ---> Masjid Tr. 3	1.58	0.48	1.10	1957 (65)	9652.38	7.81	0.01	4	15
25	TPC Carnac R/S-->Girgaum Tr. 1	3.81	0.64	1.47	1957 (44)	12849.61	7.81	0.01	17	41
26	TPC Carnac R/S--> Mumbadevi Tr.1	1.48	1.48	3.42	1966 (57)	29948.69	7.81	0.02	4	15
27	TPC Carnac R/S--> Mumbadevi Tr.2	1.86	1.60	3.70	1966 (57)	32376.96	7.81	0.03	2	11
28	TPC Carnac R/S--> Mumbadevi Tr.3	1.49	1.49	3.44	1966 (57)	30151.04	7.81	0.02	0	8
29	TPC Mahalaxmi -->Cumballa Hill Tr. 1	5.76	1.97	4.56	1983 (40)	39924.84	7.81	0.03	19	46
30	TPC Mahalaxmi -->Cumballa Hill Tr. 2	5.77	2.45	5.66	1983 (40)	49577.22	7.81	0.04	15	37
31	TPC Mahalaxmi --->Nepean sea Tr. 4	2.44	2.25	5.20	1983 (40)	45530.10	7.81	0.04	2	12
32	BEST Backbay RSS --->Girgaum Tr. 2	4.51	2.25	5.20	1978 (44)	45530.10	7.81	0.04	11	30
33	TPC Dharavi R/S --->Sitladevi Tr.1	2.20	2.20	5.08	1984 (39)	44518.32	7.81	0.03	3	14
34	TPC Dharavi R/S --->Sitladevi Tr.2	2.21	2.09	4.83	1984 (39)	42292.40	7.81	0.03	4	16
35	TPC Dharavi R/S --->Sitladevi Tr.4	2.14	2.09	4.83	1984 (39)	42292.40	7.81	0.03	4	15
36	TPC Dharavi R/S ---> Mahim Tr.1	3.22	0.85	1.96	1982 (41)	17200.26	7.81	0.01	9	25

Sr. No.	Particulars	Existing Length (in kms)	Proposed Length (in km)	Reduction in Loss (in kW)	Cable Laid (in Yrs) (Cable Life)	Per Year Unit Lost (kwh)	ABR in Rs.	Prop. Amount to be Saved in Cr.	No. of Faults (in Nos.)	No. of Joints (in Nos.)
A	B	C	D	E	F	G	H	I	J	K
37	TPC Dharavi R/S ---> Mahim Tr.2	3.15	0.80	1.85	1982 (41)	16188.48	7.81	0.01	8	23
38	TPC Carnac R/S ---> Masjid Tr. 2	1.27	1.27	2.93	1984 (39)	25699.21	7.81	0.02	2	12
39	TPC Dharavi R/S --->Kingsway Tr.1	2.65	0.39	0.90	1956 (67)	7891.88	7.81	0.01	6	20
40	TPC Parel R/S --->Mazgaon Dock Tr.1	3.27	2.50	5.78	1986 (37)	50589.00	7.81	0.04	8	23
41	TPC Antop Hill R/S --->Kingsway Tr.2	3.86	2.00	4.62	1989 (34)	40471.20	7.81	0.03	4	16
42	Haji Ali Jn. --->Cumballa Hill Tr.1	3.00	3.00	6.93	1983 (40)	60706.80	7.81	0.05	-	3
43	Haji Ali Jn. --->Cumballa Hill Tr.2	3.00	3.00	6.93	1983 (40)	60706.80	7.81	0.05	-	2
44	TPC Dharavi ---> PMGP Tr.4	2.40	2.00	4.62	1989 (34)	40471.20	7.81	0.03	-	7
45	Khetwadi RSS --> Nepean Sea RSS TR 1 (Part)	0.80	0.80	1.85	1983 (40)	16188.48	7.81	0.01	-	5
46	Khetwadi RSS --> Nepean Sea RSS TR 2 (Part)	0.80	0.80	1.85	1983 (40)	16188.48	7.81	0.01	-	5
47	TPC Mahalaxmi RS--> Nepean Sea TR 4 (Part)	0.80	0.80	1.85	1983 (40)	16188.48	7.81	0.01	-	5
48	Khetwadi RSS--> Malabar Hill TR 3 (Part)	0.80	0.80	1.85	1983 (40)	16188.48	7.81	0.01	-	5
49	TPC Carnac RS --> Malabar Hill TR 2 (Part)	5.20	1.25	2.89	1982 (41)	25294.50	7.81	0.02	-	6
50	TPC Dharavi RS --> Mahim Causeway TR 1	2.70	2.70	6.24	1982 (41)	54636.12	7.81	0.04	-	10
51	TPC Dharavi RS --> Mahim Causeway TR 1	2.70	2.70	6.24	1982 (41)	54636.12	7.81	0.04	-	10
52	TPC Dharavi RS --> Mahim Causeway TR 1	2.70	2.70	6.24	1982 (41)	54636.12	7.81	0.04	-	10
53	TPC Dharavi RS --> Mahim Causeway TR 1	2.70	2.70	6.24	1982 (41)	54636.12	7.81	0.04	-	10
	TOTAL	**142.35**	**100.14**	**231.33**	1982 (41)	**2026473.93**	7.81	**1.58**		

<table>
<tr><td>54</td><td colspan="5">Diversion & re-establishing of 33kV cable and laying of 33kV cables for augmentation of existing RSS/New RSS</td></tr>
<tr><td></td><td>TPC Mahalaxmi --->Shriram Mill</td><td>1.520 km</td><td rowspan="2">Jn. Of PandurangBudhkar& S SAmrutwarMarg -->SaiSundar DSS Tr.1</td><td rowspan="2">0.750 km</td><td></td></tr>
<tr><td></td><td>TPC Parel R/S ---> Nestle RSS Tr.1</td><td rowspan="6">9.977 km</td><td></td></tr>
<tr><td></td><td>TPC Parel R/S ---> Elphinstone Mill RSS Tr.1</td><td rowspan="2">Jn. Of PandurangBudhkar& S SAmrutwarMarg -->SaiSundar DSS Tr.2</td><td rowspan="2">0.750 km</td><td></td></tr>
<tr><td></td><td>TPC Parel R/S ---> Worli RSS Tr.2</td><td></td></tr>
<tr><td></td><td>TPC Parel R/S ---> Futurex HT RHS</td><td>TPC Dharavi --->Kalakilla Tr.1</td><td>2.900 km</td><td></td></tr>
<tr><td></td><td>TPC Parel R/S --->MaratonFuturex</td><td>TPC Dharavi --->Kalakilla Tr.2</td><td>2.900 km</td><td></td></tr>
<tr><td></td><td>TPC Mahalaxmi R/S ---> Apollo Mill RSS Tr. 2</td><td>TPC Mahalaxmi ---> India Bull</td><td>0.960 km</td><td></td></tr>
<tr><td></td><td></td><td>11.497km</td><td></td><td>8.26 km</td><td>19.757 km</td></tr>
</table>

- BEST has proposed to replace age old cables having more number of joints about 100 KM cable under RDSS. ***(Kindly refer above Table No. 26).***

(i) BEST has also proposed to establish feed between “Apollo Mill RSS Tr.No.2 and TPC Mahalaxmi RS” and to re-establish feed of “Nestle RSS Tr.1, Elphinstone Mill RSS Tr.1 & Worli RSS Tr.2 from TPC Parel RS” by laying new cables. For installation & commissioning of additional T/F at Ballard Estate, cable laying is proposed from “TPC Carnac to additional T/F at Ballard Estate RSS”.

(ii) Earlier vide MERC reference Letter No. MERC/CAPEX/2017-18/4706 dated 12.11.2017 commissions in principle approval were obtained "for replacement of 33 kV cable on L T Marg from Metro Junction to Mohd. Ali Rd, for G T Hospital, Esplanade, Girgaum, Malbar Hill, Marine Drives, Apollo Bunder Rd" and "part of cable for Hutatma Chowk, Marine Drive, G T Hospital, Colaba, Naval Dock, Ballard Estate and Navy Nagar RSS". Out of which some part of cable near Esplanade and N M Joshi Marg is replaced under IPDS. Now BEST has proposed to replace balance age old cable under RDSS.

(iii) As per MYT Regulation 2019 dated 1st August, 2019, the life of "Underground cable including joint boxes is about 17 years (considering depreciation rate as 5.28%).But we have proposed the 33 kV cables for replacement(Sr. No. 1 to 46), had been completed their useful life more than 34 years. For life of cable, ***kindly refer above Table 26, Column F (bracket figure indicates life of cable).***

(iv) Sample loss calculation:
I - Current, R - Resistance of conductor and C- Core (phase)

1. **Loss Calculation for new Scheme (new cables):**
   Conductor Resistance: 0.061 per km
   Loss in Cable per Km = $(I)^2 * R * C/1000$

$= (180)^2*0.0601*3/1000$
= 5.93kW

2. **Loss Calculation for existing Scheme (old cables):**
   Conductor Resistance: 0.085 per Km
   Loss in Cable per Km = $(I)^2 * R * C/1000$

$= (180)^2*0.085*3/1000$
= 8.262kW

Net Loss in kW = 2-1 =8.262-5.93 = 2.332

Net Loss per year in units (kwh) =2.332*24*365 =20,428.32

Net Loss in Rs. = 20,428.32*7.81 (ABR is Rs.7.81 per unit)
= Rs.1,59,545.18
= ₹ 0.016 Cr.

Net Loss for 100.14 km =Rs. 100.14*0.016 Cr = ₹ 1.60 Cr.

3. Cost Sheet of 33 kV, 3CX 3CX300 SQ MM Cu XLPE cable:

Table 26: Detail cost sheet of 33 kV, 3CX300 SQ MM Cu XLPE

Estimated Cost per km -Supply & Laying of 33 kV, 3C x 300 sq.mm Cu. XLPE cable (As per P O placed on M/s Tata Power Co. Ltd for FY22-23)

SRNO	DESCRIPTION	QTY	UNIT	RATE/UNIT in ₹	AMOUNT in ₹	TOTAL in ₹
A	**Total Material + Material Transport Charges = 1 + 2**					
1)	**Material**					
i	33 kV 3C x 300 sq.mm Cu. XLPE cable.	1000	mtrs	10804.41	10804410.00	
iii	Laying material for 33 kV cable. (R.C.C Tiles)	1000	mtrs	66.20	66200.00	
iv	Pipes.OD 200 mm	100	mtrs	5098.64	509864.00	
iv	33 kV, H.S Type Straight joint XLPE-XLPE	3	Nos.	39970.08	119910.24	
vi	Seal for 33KV, (3CX300) Cu. XLPE Cable	2	Nos.	23669.78	47339.56	
vii	33V, H.S Type Terminations Kits	0	Nos.	23669.78	0.00	
2)	**Material transport charges**					
i	Drum	4	Nos.	3969.49	15877.96	
ii	Lorry	6	day	2646.32	15877.92	11579479.68
B	**Total Labour Charges**					
i	33 kV, H.S.Straight joint work. Cu. XLPE	3	Nos.	8780.92	26342.76	
ii	Seal for33KV XLPE Cable	2	Nos.	4396.71	8793.42	
iii	33V, H.S Terminations Kits (185 to 300) Cu XLPE	0	Nos.	4396.71	0.00	
iv	Pulling through pipes/ trench.	100	Mtrs	312.26	31226.00	
vi	Exca, Backfilling and laying 1 cable on Road	1000	mtrs	3304.07	3304070.00	3370432.18
C	**Supervision Charges: Nil**					**0**
D	**Total Material & Labour Charges = A+B+C**					**14949911.86**
E	**Total Permanent reinstatement charges = RI charges x M.F. of RI**	RI Charges		M.F.		
ii	Excavation on Road (Mastic Asphalt)	1000	**13660**	**1**	1,36,60,000	**1,36,60,000**
F	**Total Estimated Cost = D + E**					**2,86,09,911.90**
G	**Total Cost for laying of 1000 meter cable (Excluding GST)**					**2,86,09,911.90**
H	**18% GST**					**51,49,784.14**
I	**Total cost for laying of 1 KM cable with GST in Cr.**					**3,37,59,696,.04**
J	**Grand Total for laying 120 Km of Cable in Cr**					**405.12**

3. Estimated Costing of the RSS Scheme

Table 27 Costing of RSS Schemes

Sr. No.	Name of Scheme	Cost in ₹
A.	**Additional Transformers**	
	Installation of Additional 33/11 kV, 16 MVA T/F (1 No.) at Pratiksha Nara RSS and 33/11-6.6 kV, 16 MVA T/F at Naval Dock RSS (1 No.) (Qty-2)	**7,15,64,892.69**
B.	**Replacement of Transformers:**	
	(i) Replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS viz. Mahalaxmi (2 Nos.), Sitaladevi (1 No.), Mazgaon Dock (2 Nos.), Sewree (2 Nos.), Kussara (1 No.), KEM Hosp (1 No.) & Naval Dock (2 Nos.), (Qty-11 Nos.) (ii) Replacement of 33/11 kV, 15/16 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS viz. Apollo (3 Nos.), Hutatma Chowk (3 No.), Mahim (1 No.) (Qty-7 Nos.)	**49,83,45,422.27**
C.	**Replacement of 33 kV, 1500 MVA Primary Switchgears**	
	Replacement of 33 kV, 1500 MVA Primary Switchgearsviz. Mazgaon Dock (1 No.), Mumbadevi (2 Nos.), Mahim (2 Nos.), Masjid (1 No.), KEM Hospital (1 No.), Nair Hospital (1 No.), Kingsway (2 Nos.) Apollo (1 No.), Prabhadevi (2 Nos.), Nestle (1 No.), Ballard Estate (3 Nos.)& Colaba (1 No.). (Qty-18 Nos.)	**4,64,57,456.56**
D.	**Replacement of 11 kV, 350 MVA Secondary Switchgears**	
	Replacement of 11 kV, 350 MVA Secondary Switchgearsviz. Mahim causeway (2 Nos.), Grant Road (4 Nos.), Mahalaxmi (1 No.), Prabhadevi (2 Nos.), Kussara (2 Nos.), Apollo (2 Nos.), Dharavi (2 Nos.), Sewree (2 Nos.), Esplanade (3 Nos.), Mahim (2 Nos.), Wadala (2 Nos.), Malbar Hill (2 Nos.), KEM Hospital (1 No.), Worli (2 Nos.), Nair Hospital (1 No.) & Mahalaxmi (2 Nos.)(Qty-32 Nos.)	**38,15,39,673.81**
E.	**33 kV, 3CX300 SQ. MM Cu XLPE Cable**	
(i)	(i) Replacement of old /outlived 22/33 kV, 3CX300 SQ. MM Cu XLPE Cable (100 KM) (ii)Additional Laying of 33 kV, 3CX300 SQ. MM Cu XLPE Cable (20 KM)	**405,11,63,519.38**
F	PMA Charges	**3,05,64,000.00**
	GRAND TOTAL in Rs.	**507,96,34,964.70**

4. Cost Benefit Analysis (CBA):

The Cost of total DPR is revised due to due to revision in RI Charges, Revision in cost of ADMS and deletion of MDM part from the DPR. The benefits of the capital expenditure proposed to be incurred under this Scheme may be divided into two parts; namely- Tangible benefits and Intangible benefits.

The expense heads under this scheme contain both developmental costs i.e., those cost incurred for network augmentation and non-developmental costs i.e., those cost incurred for network upkeep and maintenance which do not directly contribute to increased sale of power. However, these expenses too are necessary for reliable supply of power in the long run and hence have been included in the cost benefit analysis given below.

Although the benefit of the augmentation will accrue for the entire life of the equipment installed, they have been projected for a period of five years only.

4.1 Tangible benefits:

1. **Benefits due to replacement of age old switchgears:-**

Tangible benefits can be achieved by replacement of age old equipments such as 33 kV and 11 kV (350MVA) switchgears. Due to reduction in off supply period, considerable amount of cost will be saved. Further to this, it will improve reliability and quality of power supply.

2. **Tangible Benefits due to replacement of old Power Transformers with New Power Transformers**:

Under RDSS, total 18 Nos. of T/Fs are proposed to be replaced. Existing old T/Fs were procured with total 63 kW (NLL- 9 kW & TL - 63 kW) losses. However, these losses are now reduced to 52.50 kW (NLL- 8.5 kW & TL – 52.50 kW) from 63 kW, because of which there is net saving of 10.50 kW. Yearly about 26,83,843.20 units will be saved costing of ₹ 2.10 Cr. ***For detail calculation, refer Annexure-O.***

Please note that due to ageing losses of the T/Fs are increased. Current losses of T/Fs are more than 15% of initial losses (Losses at the time of installation). While calculating the losses, existing losses due to ageing are not considered.

3. **Tangible Benefits due to replacement of age old 33 kV Cables:**

Please note that existing PILC/XLPE cables are more than 30 years old & having number of joints resulting increase in **I^2R loss**. It is estimated that about ₹ **1.60**Cr (100.14 kM) cost will be saved against up-gradation 33 kV HV cables under RDSS. ***For detail calculation, kindly refer Annexure-P.***

4. Due to replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA and upgrading the voltage level from 22 kV to 33 kV, there will be substantial reduction in distribution losses. ***Kindly refer Annexure-Q***.

5. **Revenue due to additional sales**

Table 28: MVA Capacity addition

Sr. No.	Particulars	Units	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27
1	Total capacity added	MVA	16	70	18	0
2	Average P. Factor	--	0.9900	0.9900	0.9900	0.9900
3	RoE/ unit	Rs./Unit	0.3013	0.2961	0.2961	0.2961

Calculations of RoE for FY 2023-24 (Case No.212 of 2022 dtd.31.03.2023)

Return on Equity for FY2023-24= Rs.143.82 Cr) Refer -Annexure-R, Pg. No.7 of 7
Distribution Loss = 4.18% -- Annexure-R Pg. No.4 of 7
Energy sale = 4772.81 Mus. -- Annexure-R Pg. No.4 of 7
R0E per unit = $143.82 \times 10^7 / 4772.81 \times 10^6 = 0.3013$

Calculations of RoE for FY 2024-25 (Case No.212 of 2022 dtd.31.03.2023)

RoE for FY2024-25= Rs.148.72 Cr), Refer -- Annexure-R Pg. No.4 of 7

Distribution Loss = 4.18% -- Annexure-R Pg. No.4 of 7

Energy sale = 5023.20 Mus. --Annexure-R Pg. No.4 of 7

R0E per unit = $148.72 \times 10^7 / 5023.20 \times 10^6 = 0.2961$

For calculation of RoE per unit, the values of RoE, Distribution Loss, and Energy Sales are taken from the approved Copy of MERC Order Case No. Case No.214 of 2022 dtd.31.03.2023 and same is enclosed as ***Annexure –R, Pg. No. 1-7 of 7.***

Projections for the additional revenue accrued due to potential additional sales for a 5Year period is given below:

Table 29: Calculation of revenue from additional sales

Particulars	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28
Capacity Addition (MVA)	16	70	18	-	-
Cumulative capacity Added (MVA)	16	86	104	104	104
Incremental loading	20%	30%	40%	50%	60.04%
Distribution losses	4.18%	4.18 %	4.18 %	4.18 %	4.18 %
System power factor	0.9900	0.9900	0.9900	0.9900	0.9900
Additional sales (MU)	26.59	156.23	257.61	344.03	430.51
RoE per Unit (Rs/ unit)	0.3013	0.2961	0.2961	0.2961	0.2961
Total revenue (Rs. Crore)	0.80	4.63	7.63	10.19	12.75

For estimation of additional MUs saleable, only incremental loading of the RSS has been considered. It is assumed that in the first year of commissioning, a new transformer shall be loaded to the extent of 20%, in the 2nd year at 30%, in the third year at 40%, in the 4th year at 50% and finally in the fifth year at 60.04% or equivalent to the average load factor of the system. The load factors for each year shown in the table above are the weighted average of the transformer capacity and their incremental loading for that year.

A sample calculation for estimating the additional units sold is given below:

No. of units realized in FY 2020-21

= Load * Power Factor * Incremental load * No. of hours per day * No. of days * (1-Distr. Loss) / 10^6

= 16 * 0.9900 * 20% * 24 * 365 * 1000 * (1-4.18%)/10^6 = 26.59 MUs.

Based on the above calculations the total benefit that can be accrued from the proposed capital expenditure under this scheme is as below:

Table 30: Benefits from RSS project schemes

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Revenue due to additional sales (₹ in Cr.)	0.80	4.63	7.63	10.19	12.75
Revenue realised (₹ in Cr.)	0.80	4.63	7.63	10.19	12.75

4.2 Intangible Benefits

1. The replacement of old age cables help in meeting increasing load in its area of installation and to improve quality and reliability of supply.

2. In addition to above replacement of outlived Switchgear and Transformers with New Switchgear & Transformers, the scheme will enhance the safety and also reduce supply interruptions and thus will generate additional revenues.

3. **Summary of the Benefits /Savings due to up-gradation of Distribution Infrastructure:**

Table 31: Summary of benefits **Amount ₹ in Cr.**

Sr. No.	Particulars	FY 23-24	FY 24-25	FY 25-26
1.	Replacement of Power Transformers	2.10	2.10	2.10
2.	Replacement of 33kV Cables	1.60	1.60	1.60
3.	Augmentation of RSS & DSS	0.80	4.63	7.63
	GRAND TOTAL SAVING in Cr.	**4.50**	**8.33**	**11.33**

5. Phasing of capital expenditure and Capitalisation:

Table: 32 Schedule of Capitalisation of RSS Schemes **Amount ₹ in Cr.**

Particulars	FY 23-24	FY 24-25	FY 25-26	Total
Capital Expenditure with PMA	122.93	216.65	168.369	507.97
Capitalization with PMA	122.93	216.65	168.369	507.97
Approved CAPEX	51.62	101.16	80.14	232.92
Approved Capitalization	51.62	101.16	80.14	232.92
Approved PMA Charges	0.54195	1.2945	1.65735	3.4938
Approved 60% Grant of PMA	0.32517	0.7767	0.99441	2.096328
60% Grant on CAPEX	30.97	60.70	48.08	139.75
Capitalization with Grant	21.68	51.78	66.29	139.75
Total Grant with PMA	31.29	61.48	49.08	141.85

APPENDIX-1:

1. Part1:

Part-I: Particulars of RSS furnished in the over view of the DPR	
1.1.	**Name of Applicant**: BEST (Brihanmumbai Electric Supply & Transport undertaking)
1.2.	**Name of the Capital Investment Work**: Renovation/Augmentation of Infrastructure at power/Receiving Substations
1.3.	**Nature of CAPEX Scheme (Revised):** Revised RDSS DPR Scheme on "Power/Receiving Substations Infrastructure works for Loss Reduction" is submitted as per MERC (Approval of Capital Investment Schemes) Regulations, 2022.
1.4.	**Details of the Location**: Mumbai circle (BEST's Licensee Area)
1.6	**Date of Approval by Competent Authority designated by the Board of Directors of the Company**: A copy of management approval for RDSS Scheme including "Implementation of Infrastructure works under Loss Reduction" is enclosed as **Annexure-E (BCR Copy), 1-78 of 78.**
1.7.	**Category of DPR**: This DPR Scheme falls under Regulation 3.9 of MERC (Approval of Capital Investment Schemes) Regulations, 2022. Category are as follows: 3.9 (a) Infrastructure required for releasing new supply connections. (b) System strengthening by enhancing capacity of inter-alia, Sub-station, cables, and Circuit Breaker, to mitigate overloading or to provide redundancy or to improve voltage profile or reduce losses; (e) Capital Nature Schemes funded partially by Central or State Government Grants; (h) Capacity augmentation of distribution lines and transformers at existing DSS or RSS; (i) Improvement in quality of supply & reliability of distribution system. (j) Emergency Restoration System involving asset replacement; (o) Improvement in consumer services and (p) Obsolescence of assets and absence of support from Original Equipment Manufacturer
1.8.	Objective of the Capital Investment: The basic objective of the scheme is to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25. (BEST had already achieved this target. BEST's Distribution loss is less than 5%). Further, objective is to reduce ACS- ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMS and for improvement in the quality, reliability and affordability of power supply to the consumers through a financially sustainable and operationally efficient Distribution Sector. This can be achieved by replacing age old outlived T/Fs, cables and associated equipments, also to replace age old/ obsolete 33 kV & 11 kV switchgears. 24x7 power supply for consumers in Mumbai City Reduction of AT&C losses/maintaining of existing low level of AT&C losses To maintain reliability and quality of Electric Supply to the Consumers
1.9	**Need of Analysis**: GoI has launched RDSS to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25. To meet this objective GoI has approved the schemes of replacement of age old T/Fs, Switchgears and cables. For improvement in the quality, reliability and affordability of power supply to the consumers it is necessary to replace age old T/Fs, Switchgears and cables etc.
1.10	**List of Identical schemes previously approved by the Commission and their progress report (5 years data):** First time BEST is implementing the Schemes for Loss Reduction

	under RDSS. Hence, no previous records of such schemes.
1.11.	**State Map showing Location of the Scheme (for Transmission)**- Not Applicable
1.12.	**Brief scope and specification of work**: Renovation/Augmentation of infrastructural work of Power /Receiving Substations. (i) Installation of 33/11 kV, 16 MVA additional T/Fs (Qty-2 Nos.) (ii) Replacement of age/old T/Fs at various RSS (Qty-18 Nos.) (iii) Replacement of 33 kV, 1500 MVA Primary Switchgears (Qty-18 Nos.) (iv) Replacement of 11 kV, 350 MVA Secondary Switchgears (Qty-32 Nos.) (v) Replacement of 3CX300 SQ. MM. Cu XLPE cable (Qty-100 KM) (vi) Laying of additional 3CX300 SQ. MM. Cu XLPE cables (Qty-20 KM) ***For copy of Specifications of above items, kindly refer Annexure-S.***
1.13.	**Any Reference of Study Report / recommendation of OEM/Expert:** N.A for this DPR.
1.14.	**Estimated CAPEX Cost**: Rs.507.96 Cr. (FY 2023-24–122.93 Cr, FY 2024-25–216.65Cr. and FY 2025-26-168.39 Cr.) IDC is not included in the costing. **A copy of Cost Sheet enclosed as Annexure-T.**
1.15.	**Time Frame of the expenditure:** Project completion Period 36 months. Table 33:Time frame of Capex & Capitalization

Financial Year	Capex Expenditure (in ₹)	Capitalisation (in ₹)
2023-24	**122,93,14,048.73**	**122,93,14,048.73**
2024-25	**216,64,64,586.87**	**216,64,64,586.87**
2025-26	**168,38,56,160.07**	**168,38,56,160.07**
TOTAL	**507,96,34,795.67**	**507,96,34,795.67**

1.16. **Funding arrangement: For FY2023-24toFY 2031-32 (for 9 years from the date of contract).**

Table 34: Percentage wise sources of fund

Sources of Funds	**Amount (₹ in Cr.)**	**Share (%)**
Debt (90% of balance cost)	329.50	65
Equity (10% of balance cost)	36.61	7
Grant (60% of approved cost)+PMA	**141.85**	28
Consumer Contribution/Deposit Works	-	-
Total	**507.96**	**100**

Please kindly note that PFC approved cost of RSS project is ₹ 232.92 Cr. and Grand of ₹ 139.75 Cr. Shall be made available from GoI for this project which is 60% of approved cost. Also, PMA approved cost for RSS is ₹2.10 Cr. So, total Grant amount will be ₹141.85 Cr. ***Kindly refer Table No.32, Pg. No.54 (details of Approved PFC Charges)***

1.17

Benefits/Impact on RSS Schemes:

- There is saving in distribution losses. Improved billing Accuracy.
- It will generate additional revenues.
- It will improve reliability and quality of power supply.

Impact on tariff by considering 60% Grant and without Grant is given below:

	Table 35: Tariff Impact with and without GoI Grant (for RSS) in ₹ F .Y. | 23-24 | 24-25 | 25-26 | 26-27 | 27-28 | 28-29

Table 35: Tariff Impact with and without GoI Grant (for RSS) in ₹

F .Y.	23-24	24-25	25-26	26-27	27-28	28-29
With Grant	0.0183	0.0636	0.1114	0.1277	0.1220	0.1171
Without Grant	0.0245	0.0869	01541	0.1772	0.1694	0.1626

Tariff impact with Grant and without Grant is worked out and same is shown in the above table. ***For Tariff Impact with and without Grant, kindly refer Annexure-U & Annexure –V respectively.***

1.18. **Overall Cost-benefit Analysis**: Benefits from RSS project schemes

Table 36: Revenue due to additional sales **Amt ₹ in Cr.**

Particulars	FY23-24	FY24-25	FY25-26	FY26-27	FY27-28
Revenue due to additional sale	0.80	4.63	7.63	10.19	12.75
Revenue realized (Rs. in Cr.)	0.80	4.63	7.63	10.19	12.75

For overall Cost Benefit, kindly refer Annexure-W, Pg. No.1 of 2.

2. PART-II: Particulars of RSS DPR furnished for justification of works)

2.1	**Need of the investment**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' are to achieve an efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like high AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas being concentrated by the government for the development of country. The government has taken initiatives for (i) complete revamping of power sectors electrical equipment across the country and (ii) for the need of changing the way of operation and control of the electrical equipment. Accordingly,, Govt. of India has launchedthe Revamped Distribution Sector Scheme (RDSS) to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. The Scheme would be available till the year 2025-26. REC and PFC have been nominated as nodal agencies for facilitating implementation of the Scheme. Accordingly, Power Ministry of Govt. of India has issued guidelines for implementation of RDSS **Objective of the scheme:** There is addition of new consumers due to development of Coastal Road, Mill and SRA Schemes, EV Charging, Sewree bridge, Redevelopment of Plots etc. In order to meet the requirement of new Consumers for releasing new Load, Smart Meters are required installed. • 24x7 power supply for consumers in Mumbai City • Reduction of AT&C losses/maintaining of existing low level of AT&C losses • To maintain reliability and quality of Electric Supply to the Consumers
2.2	**Time lines of the Project:** 1. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.1), project approval date was 31.03.2023. As per guidelines BEST had prepared Action Plan and DPR for FY 2023-24, FY2024-25 & FY2025-26 by considering the audited annual accounts for FY 2019-20 & FY2020-21 and submitted to the Executive Director (IPDS), PFC on 22.08.2022.

	2. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.2),the last date for completion of this scheme will be 31.03.2026. The works executed beyond this time lime will not be eligible for getting grant of GoI. ***For Guidelines of RDSS, Kindly refer Annexure-C.***
2.3	**Scheme for revised approval/scope/cost**: This Scheme is revised and submitted as per MERC (Approval of Capital Investment Schemes), Regulations 2022.
2.4	**Proposed Capital Investment Scheme**: Proposed Capital Investment includes replacement of age old T/Fs, 33 kV & 11 kV Switchgears and age old 33 kV cables. In this DPR, capital investment is proposed to be executed as per MERC (Approval of Capital Investment Schemes) Reg. 2022.
2.5	**Technical Justification**: 1. Govt. of India has launchedthe RDSS to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. 2. **MYT Regulation:** As per Clause No. 74.1 of MYT Regulation 2019, BEST has submitted DPR for strengthening and augmentation of its distribution network meeting the requirement of load growth, reduction in distribution losses, improvement in quality of supply, reliability, reduction in congestion, etc. 3. As per Capex Regulation, 2022 Clause, 3.9 (a) Infrastructure is required for releasing new supply connection of EV Charging at Anik Bus Depot and new supply connection of Indian Naval Authority, 3.9 (e) Capital Nature funded schemes partially by Central Government of India for commissioning of additional T/F at Pratiksha Nagar and Naval Dock RSS, 3.9 (h) Capacity augmentation of RSS by installing additional T/F at Pratiksha Nagar and Naval Dock RSS, 3.9 (i & o) Improvement in quality and reliability of distribution system and improvement in consumer services at both RSS. **4.** Life of all electrical equipments and cables consider in the DPRhad been completed and for safety point of view it is proposed for replacement.

2.6	**Financial Justification:** 1. As per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilize internal funds for executing all its Capital Expenditure plans. But due to financial crunch for in house schemed Best has decided to utilize 30% equity from internal sources and balance debt portion of 70% will be borrowed from financial institutions such as REC, PFC, Banks, etc. 2. In RDSS Project, for infrastructure works, GoI has sanctioned 60% Grant against sanctioned DPR Cost. For Power/Receiving Infrastructure works, GoI has approved Rs.139.75 Cr Grant as against approved project cost of Rs. 232.92 Cr. Further to this, Rs. 3.49 Cr. Amount is sanctioned for PMA and Grant against this PMA cost will be Rs. 2.10 Cr. So, total Grant available for RSS project will be Rs.141.85 Cr. 3. For execution of RSS project actual cost arrived by tendering process with RI Cost is Rs.507.96 Cr. Out of which Rs.141.85 Cr will be the grant amount and balance Rs. 366.11 Cr will be the amount which will be borne by BEST. Out of Rs.366.11Cr. equity amount will be 10% i.e. Rs 36.61 Cr. and balance 90% amount of Rs. 329.50 Cr. Will be made through debt. 4. BEST has applied to REC for loan amount for execution of RDSS. 5. The Immediate & Long term benefits will be achieved as follows. **Immediate Objectives :**Less failure and thus Improved SAIDI/ CAIDI values **Long Term Objectives:** Increased service reliability 6. **Scrapping of replaced assets:** After removing the serviceable parts, all the removed material will be scrapped and the cost recovered after scrapping will be considered at the time of MYT Petition under head '**other income**'. Under replacement, all old material which is above ground level like switchgears, transformers etc. is recovered and same will be scrapped, so there is no any material is going to be abandoned. ***For Scrapping policy, refer Annexure-X.***
2.7	**Consent of M-DNAC**: As per Electricity Act, 2003, Clause, 42(3), BEST undertaking being a local authority, hence exempted from open Access.
2.8	**Plan of other Transmission Licensees / CTU**: DPR is related to Distribution Licensees, hence Not Applicable.
2.9	**Phasing of Investment** : Table 37: Phasing of capital investment
2.10	**Statutory/Safety Requirement: N.A**

Table 37: Phasing of capital investment

Financial Year	Capex Expenditure (in ₹ Crore)	Capitalisation (in ₹ Crore)
2023-24	122.93	122.93
2024-25	216.65	216.65
2025-26	168.39	168.39
TOTAL	**507.96**	**507.96**

2.11

Cost Assessment /Cost Break-up:

Table 38: Cost break up of RSS items

Sr. No.	Name of Scheme	Qty (in Nos)	Cost in ₹
A.	**Additional Transformers**		
	Installation of Additional 33/11 kV, 16 MVA T/F at Pratiksha Nara RSS and 33/11-6.6 kV, 16 MVA T/F at Naval Dock RSS	**2**	**7,15,64,892.69**
B.	**Replacement of Transformers:**		
	(i) Replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS viz. Mahalaxmi (2 Nos.), Sitaladevi (1 No.), Mazgaon Dock (2 Nos.), Sewree (2 Nos.), Kussara (1 No.), KEM Hosp (1 No.) & Naval Dock (2 Nos.), (Qty-11 Nos.) (ii) Replacement of 33/11 kV, 15/16 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS viz. Apollo (3 Nos.), Hutatma Chowk (3 No.), Mahim (1 No.) (Qty-7 Nos.)	**18**	**49,83,45,422.27**
C.	**Replacement of 33 kV, 1500 MVA Primary Switchgears**		
	Replacement of 33 kV, 1500 MVA Primary Switchgearsviz. Mazgaon Dock (1 No.), Mumbadevi (2 Nos.), Mahim (2 Nos.), Masjid (1 No.), KEM Hospital (1 No.), Nair Hospital (1 No.), Kingsway (2 Nos.) Apollo (1 No.), Prabhadevi (2 Nos.), Nestle (1 No.), Ballard Estate (3 Nos.)& Colaba (1 No.).	**18**	**4,64,57,456.56**
D.	**Replacement of 11 kV, 350 MVA Secondary Switchgears**		
	Replacement of 11 kV, 350 MVA Secondary Switchgearsviz. Mahim causeway (2 Nos.), Grant Road (4 Nos.), Mahalaxmi (1 No.), Prabhadevi (2 Nos.), Kussara (2 Nos.), Apollo (2 Nos.), Dharavi (2 Nos.), Sewree (2 Nos.), Esplanade (3 Nos.), Mahim (2 Nos.), Wadala (2 Nos.), Malbar Hill (2 Nos.), KEM Hospital (1 No.), Worli (2 Nos.), Nair Hospital (1 No.) & Mahalaxmi (2 Nos.)	**32**	**38,15,39,673.82**
E.	**33 kV, 3CX300 SQ. MM Cu XLPE Cable**		
	(i) Replacement of old /outlived 22/33 kV, 3CX300 SQ. MM Cu XLPE Cable (180 KM) (ii)Additional Laying of 33 kV, 3CX300 SQ. MM Cu XLPE Cable (20 KM)	**120**	**405,11,63,519.38**
F	PMA Charges	**-**	**30563830.97**
	GRAND TOTAL in Rs.	**-**	**507,96,34,964.70**

Note: 18% GST is included in the cost.

	As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022, BEST was invited and finalised tender to appoint "Project Implementation Agency" with a transparent, competitive, fair and reasonable procedure. Subsequently, ***a copy of a Letter of Award (LoA) has been issued to M/s Tata Power Co. Ltd. which is enclosed as Annexure-H, Pg. No. 9 to 25 of 68.For detail cost estimation, kindly refer Annexure-AC.***
2.12	**Least Cost analysis /Alternatives**: For "Implementation of Renovation /Augmentation of Power /Receiving Substation Works" project under RDSS by appointing 'Implementing Agency' a tender was invited and subsequently, A ***Letter of Award (LoA) has been issued to M/s Tata Power C. Ltd. is enclosed as Annexure-H, Pg. No. 9 to 25 of 68.*** 1. As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations,2022 BEST was invited and finalised tender to appoint Agency for Implementation of RSS Project with a transparent, competitive, fair and reasonable procedure. **2.** Accordingly, the unit cost is derived from the open tender invited by advertising and following up the procure mentioned in Apendix-3. The order was placed on the technical suitable and LAO. **3. Details of offers received for execution of Power /Receiving Substation infrastructure works**: A per CAPEX Regulation, 2022, Appendix-3, tender for "Power/Receiving Substation Related Works" were invited; techno-commercial bid opened and price bid was on 13.10.2022 and 18.10.2022respectively. In the tendering process 3 Nos. of bidders have participated for the said work. Details of offers received are given in the following table Table 39: Tender cost details (RSS) <table><tr><th>Bidder No.</th><th>Tenderers</th><th>Gross Rate Including GST tax. (in ₹)</th><th>Rank</th></tr><tr><td>1</td><td>Larsen & Toubro Ltd.</td><td>3,62,64,49,682.54</td><td>3</td></tr><tr><td>2</td><td>KEI Industries Ltd</td><td>4,11,76,59,705.58</td><td>2</td></tr><tr><td>3</td><td>The Tata Power Co. Ltd.</td><td>3,44,62,66,417.32</td><td>1 (LAO)</td></tr></table>The tender is awarded to the LAO viz. The Tata Power Company Limited with total contractual value of ₹ 344.63 Cr., excluding R.I. charges towards excavation for cable laying work. ***For detailed as mentioned in the above table, kindly refer Annexure –E, Pg. No. 18 of 78.***
2.13	**If not and if Deferred Analysis**: For this case not applicable.
2.14	**Overall Cost-benefit Analysis**: • Due to execution of Capital Schemes, there is saving in distribution losses. • It will improve reliability and quality of power supply. • The scheme will enhance the safety and also reduce supply interruptions and thus will generate additional revenues

2.15	**Methodology of Put to use of the asset and computing Percentage utilization of Project**: Following methodology of put to use of the Asset is used. During the Financial Year (April to March), when the capital Expenditure made on execution of particular scheme and when this asset is "PUT TO USE" then only considered for capitalization purpose. Otherwise the said asset will be shown as WIP and IDC will be made applicable to this Scheme.
2.16	**Constraints:** In case of 33 kV age old cable replacement job, there are lot of hurdles such as excavation permission from MCGM/MHADA/MMRDA/PWD, etc. Due to scheduled programs on 6th December and 15th January on each year, permission for road/footpath opening is not released by concern authority, resulting delay in execution of the scheme.
2.17	**Inclusion in STU Plan/License for Transmission Projects. Recommendation of the Transmission Planning Committee as provided in the Grid Code:** This is not applicable to this DPR.
2.18	**Works intended for adaptation of latest Technology/Improvement/Up gradation of Existing Infrastructure: N.A.**
2.19	**Upstream/Downstream arrangement:** For this DPR such arrangement is not applicable.
2.20	**Statutory Clearances and Project Layout:** The schemes of replacement of all equipments approved in the DPR are to be executed inside the BEST's RSS. Hence, there is no any land and RoW issue. However, the replacement of 33 kV cables schemes are to be executed in public property, hence for road opening permission from competent authority such as MCGM, MHADA, MMRDA and PWD is required to be obtained before starting the scheme.
2.21	**Detailed Survey**: For execution of the scheme detail survey is already carried out by project implementing agency.
2.22	**Past Trend and Future projection**: After IPDS project, BEST has planned to execute such type of big project amounting Rs. 284.10 Cr. first time from various agencies. **Future projection**: Objective of the project is to reduce distribution loss. In case of installation of additional T/Fs at Pratiksha Nagar and Naval Dock RSS, future projection is also considered. After replacement of Infrastructure works, there are some balance assets whose life is on the verge of completion. This quantity would also be substantial. Hence there will be requirement for replacement of these other outlived assets by turnkey contract.
2.23	**Detailed Justification for quantity proposed:** Installation of T/F at Pratiksha Nagar RSS: For meeting the additional load requirement of EV Charging 1 No. of T/F was proposed to be commissioned and same is approved by PFC.

	Installation of T/F at Naval Dock RSS: For meeting load requirement of Naval authority, 1 No. of T/F was proposed to be commissioned and same is approved by PFC. BEST was proposed to replace 18 Nos. of T/Fs for loss reduction purpose and the life these T/Fs is already completed more than 25 years and same scheme is approved by PFC. BEST was proposed to replace 18 Nos. of 1500 MVA primary switchgears which are having maintenance issues and life of these switchgears is already completed more than 25 years and same scheme is approved by PFC. BEST was proposed to replace 32 Nos. of 350 MVA secondary switchgears which are having maintenance issues and life of these switchgears is already completed more than 25 years and same scheme is approved by PFC. BEST was also proposed to replace 120 KM of 33 kV, 3CX300 SQ MM cable which are having maintenance issues. i.e. frequent failure and life of these cables are already completed more than 25 years and same schemes are approved by PFC. RDSS Grant for the above works has been received and hence burden in tariff will be less. Detail justification is given in the respective sections of the item.
2.24	**Check list of the documents appended:** 1. RSS DPR in the MERC Format for FY2023-24 to FY2025-26 ***(Pg. No.1-19 &20-54)*** 2. Pat-I and Part-II Filled Formats of Capital Investment Scheme for MERC Approval (Pg.No.55-65) 3. Annexure-A: - List of RSS 4. Annexure-B: - Material Procurement Guidelines 5. Annexure-C: - Revised Guidelines of RDSS 6. Annexure-D_ PFC Submission & Approved 7. Annexure-E: - A copy of Management Approval (AR/BCR) 8. Annexure F - Procedure Order 90 D (Substation Requirement) 9. Annexure-G_EV Charging & Consumer Load 10. Annexure-H: - A LoA_M/s Tata Power co. Ltd.(9 to 25 of 68) 11. Annexure-I_ MERC DPR Approval, Revised closure Report and DPR 12. Annexure-J_ Revised STU Letter _ Naval Dock 13. Annexure-K_ MERC Approval & SLD 14. Annexure-L_Load List 15. Annexure-M 16. Annexure-N 17. Annexure-O_Power TF Loss Saving 18. Annexure-P_33 kV cable details 19. Annexure-Q_TF Loss Reduction 20. Annexure -R_Order 212 of 2022 21. Annexure-S- Specifications of RSS Items 22. Annexure-T- RSS Cost Sheet 23. Annexure-U- With Grant_Tariff Impact 24. Annexure-V- Without Grant_ Tariff Impact 25. Annexure-W- CBA_RSS & DSS 26. Annexure-X- Procedure for Scrapping

SCHEMES EXECUTED UNDER RDSS (LOSS REDUCTION)

SECTION 2

DISTRIBUTION SUBSTATION WORKS (EXCLUDING CIVIL WORKS) UNDER RDSS

Figure 5 11 kV Oil Type Switchgears

Figure 6 Oil Type RMU.

Figure 7 DSS

Figure 8 cable Laying

Fig 9: 3 core cables

4.9 SECTION -2

1. Basic Objective of the RDSS Scheme &Scope of work

1.1 Basic Objective of the Scheme: The basic objective of the scheme is to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25. However, BEST had already achieved this target. BEST's Distribution loss is less than 5%. Further, objective is to reduce ACS- ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMS and for improvement in the quality, reliability and affordability of power supply to the consumers through a financially sustainable and operationally efficient Distribution Sector. This can be achieved by replacing age old outlived DTs, cables and associated equipments, also to replace age old/ obsolete OCB's and Oil Type RMUs with SF6 DA compatible VCB's and SF6 RMUs. Considering this fact, GoI has approved following scope of work in the monitoring committee.

1.2 Scope of work:

(A) Augmentation of substations (additional / replacement of 995 kVA Distribution Transformers with associated equipments/accessories (Qty-666 Nos.).

(B) Installation /replacement of New Ring Main Units i.e. RMUs (Qty-104 Nos.)

(C) Replacement of 11 kV OCBs to VCBs at DSS (Qty-396 Nos.)

(D) Replacement of Oil Ring Main Unit by SF6 Ring Main Units at DSS (Qty-95 Nos.)

(E) Replacement of (weak/old) / additional laying of 11 kV, 3CX240 SQ.MM Al XLPE cable

(F) Replacement of (weak/old) / additional laying of LV, 4CX300 SQ.MM Al XLPE cable

2. Technical feasibility report of "Infrastructure Related Distribution Substation Works (excluding civil work) for RDSS."

(A) Augmentation of substations (additional / replacement of 995 kVA DTs with associated equipments/accessories (Qty-666 Nos.)

1. Replacement of DTs with same capacity or higher capacity(Qty-666 Nos.):-

1.1 Vide letter Ref. No. DMM/SB/06/T-TA76350/5936/2023-24 dated 01.06.2023 a contract is awarded to the firm the Rahul Cables Pvt. Ltd. for execution of the schemes mentioned at Section-2,(A). BEST has proposed to replace existing age old DTs i.e. 630 KVA- 407 Nos., 995/1000 kVA – 237Nos.,1600 KVA -21 and 3000 kVA- 1 No. and associated accessories in the existing DSS in BEST's licensee area under RDSS. ***For detail list of DTs to be replaced under RDSS, kindly refer Annexure-Y.***

1.2 Present position of DTs with outlived their life: For bifurcation of outlived DTs kindly refer following table

Table 40: Details of outlived transformers

Sr. No.	DT Rating (MVA)	Nos. of DTs in Service	Total No. of DTs outlived	DTs to be Replaced
A	B	C	D	# E
1.	315	9	9	-
2.	400	73	11	-
3.	630	1918	584	407
4.	995/1000	1164	390	237
5.	1600	278	22	21
6.	2000	1	-	-
7.	2500	2	-	-
8.	3000	5	1	1
Grand Total		**3450**	**1017**	**666**

#-Please kindly note that DTs under replacement are of ONAN and Dry Type and column E includes ONAN as well as Dry Type DTs. ***Details are given in the Annexure-Y.***

1.3 Old DTs having more losses as compared to current DTs, therefore, GoI has included replacement of DTs under Loss Reduction programme. Accordingly, monitoring committee has approved the proposal for replacement of 666 Nos. of DTs of various ratings. *For copy of 1017 Nos. of DTs, kindly refer Annexure –Y (List of DTs under replacement) &Annexure-Z (balance quantity for replacement).*

1.4 The DTs proposed for replacement had been completed their useful service life of 25 years and No DTs below 28years are considered for replacement.

1.5 **Civil work**: If minor civil work is required to be carried out at DSS for replacement of DTs, same will be carryout by the vendor.

1.6 **Cost Sheet of Replacement of DTs (Qty-666 Nos.)**

Table 41: Cost estimation of DTs under replacement

SR. NO.	PARTICULARS	Qty.	UNIT	BASIC RATE (in ₹)	BASIC RATE WITH GST (in ₹)	TOTAL COST WITH GST (IN ₹)
A	B	C	D	E	G =1.18*F	H =C*G
I)	**MATERIAL COST**					
1	11kV/415 V 630 kVA Dry Type DTs	23	NO	1701000.00	2007180.00	46165140.00
2	11kV/415 V 1000 kVA Dry Type DTs	22	NO	2572500.00	3035550.00	66782100.0
3	11kV/415 V 1600 kVA Dry Type DTs	1	NO	3307501.99	3902852.35	3902852.35
5	11kV/415 V 630 kVA ONAN Type DTs	384	NO	2190760.00	2585096.80	992677171.20
6	11kV/415 V 1000 kVA ONAN Type DTs	213	NO	2948192.00	3478866.56	740998577.28
7	11kV/415 V 1600 kVA ONAN Type DTs	22	NO	5104320.00	6023097.60	132508147.2
8	11/6.6 kV, 3000 kVA ONAN Type Auto X'er	1	NO	7507700.00	8859086.00	8859086.00
9	HT CT'S 100/60-5 for DTs with Installation	49	NO	26150.00	30857.00	1511993.00
10	FRLS Cable Supply 4CX2.5SQMM	691	MTR	265.00	312.70	216075.70
11	LV 1CX400 SQ.MM .XLPE Cu cable	9990	MTR	3510.00	4141.80	41376582.00
12	11KV Cable 3CX50 SQMM, Cu, XLPE	11102	MTR	2066.00	2437.88	27065343.76
13	1.1 KV LV 1CX400 Termination	1332	NO	1207.50	1424.85	1897900.20
14	11 KV 3CX50 SQMM, CU XLPE H S Term Kit	1028	NO.	4200.00	4956.00	5094768.00
	TOTAL COST in Rs. (1 to 8)			**25369372.49**	**29935859.54**	**2069055736.69**
SR.	**PARTICULARS**	**Qty.**	**UNI**	**BASIC**	**BASIC**	**TOTAL COST**

NO.			T	RATE (in ₹)	RATE WITH GST (in ₹)	WITH GST (in ₹)
II)	**ERECTION COST**					
15	Dismantling of Existing DTs including transport	666	NO.	12600.00	14868.00	9902088.00
16	Installation, Testing & Commissioning of DTs including Earthing Connection & Trap.	666	NO.	26250.00	30975.00	20629350.00
17	FRLS Cable Laying for DSS & DSS Equip.	691	MTR	110.00	129.80	89691.80
18	Service for making of LV 1CX400 TERM	1332	NO.	524.00	618.32	823602.24
19	Service for making of 11 kV, 3C/50 sq. mm Term	727	NO.	1261.00	1487.98	1081761.46
	TOTAL in ₹			**40745.00**	**48079.10**	**32526493.50**
	GROSS TOTAL in Rs. (I +II)			**25410117.49**	**29983938.64**	**210,15,82,230.19**

1.7 **Cost justification**: For achieving least cost, P.O is placed on Rahul Cables Pvt. Ltd. for Supply, installation, Commissioning, dismantling/replacement of DTs at DSS. ***For copy of LoA, kindly, refer Annexure H, Pg. No. 26 to 36 of 68.***

(B) Installation New Ring Main Units (RMUs)-Qty-104 Nos.

1. Technical justification for replacement of RMUs:

1.1 For supply, integration, installation, testing and commissioning of Supervisory Control & Data Acquisitions (SCADA), Distribution Management System (DMS), Operation Management System (OMS), Field Force Automation (FFA), Software Applications, Dispatcher Training Simulator (DTS) and relevant hardware contract Order is placed on M/s Larsen & Toubro (L&T). To execute this project, it is essential to replace Oil Type Switchgears/RMUs as well as SF_6 VCBs/RMUs which are compatible for Distribution Automation.

1.2 Accordingly, BEST has proposed for replacement about 104 Nos. of RMUs (Not compatible for DA) under RDSS. At present there are about 105 Nos. of SF_6 RMUs which are required tobe replaced as these RMUs are not compatible for Distribution Automation. After replacement, these RMUs can be utilized/installed where DA is not proposed. However, PFC has approved 104 Nos. RMUs. So, it is proposed to replace 104 Nos. of SF_6 RMUs. ***For total list of 104 RMUs, kindly refer Annexure-AA.***

1.3 Total 104 Nos. SF_6 RMUs (3-Way /4-Way) which are not compatible for DA can be replaced with 11 kV, 250 MVA, and outdoorSF_6 insulated (3-Way /4-Way) Ring Main Units (RMUs) with Vacuum Circuit Breakers or SF_6 circuit breakers with associated control and relay panels suitable for Distribution Automation at various DSS.

1.4 Cost Sheet of RMUs (104 Nos.)

Table: 42 Cost Sheets of SF_6RMUs (3-Way /4-Way)

SR. NO.	PARTICULARS	Qty	UNIT	BASIC RATE (in ₹)	BASIC RATE WITH GST (in ₹)	TOTAL COST WITH GST (in ₹)
A	B	C	D	E	G =1.18*F	H =C*G
I)	**MATERIAL COST**					
1	RMU 3-WAY (1ISO + 1T-OFF+ 1 FDR.)	57	NO.	770313.00	908969.34	51811252.38
2	RMU 4-WAY (1ISO + 1T-OFF+ 2 FDR.)	33	NO.	992922.00	1171647.96	38664382.68
3	RMU 4-WAY (1ISO +2 T-OFF+ 1 FDR.)	14	NO.	992922.00	1171647.96	16403071.44
4	2 Nos. of Switchgear Earthing G.I. wire 55 SQ MM (7/11 SWG) with 120 SQ MM Al Lugs at both ends with Average earthing wire of 25 meter (including both earthing at each DSS)	104	NO.	3150.00	3717.00	386568.00
5	11KV CABLES 3C*240 SQMM, XLPE, AL	575.76	MTR	2033.00	2398.94	1381208.86
6	11KV, 3C×240 SQ.MM, H S Term Kit Suitable for Al, Dry Cured, Water Swellable XLPE cable	104	NO.	4410.00	5203.80	541195.20
	TOTAL (I)			**2765750.00**	**3263585.00**	**109187678.56**
II)	**ERECTION COST**					
7	Dismantling of Existing Switchgears, B to B HT cable including material cost, Transportation	104	NO.	8400.00	9912.00	1030848.00
8	Installation, Testing, Commissioning, of RMU including Earthing connection, Trans & misc material cost	104	NO.	15750.00	18585.00	1932840.00
9	11KV, 3C*240 SQMM, XLPE, AL cable laying	575.76	MTR	315.00	371.70	214009.24
10	Service for making of 11KV, 3C×240 SQ.MM, H S Term Kit Suitable for Al, Dry Cured, Water Swellable XLPE cable	104	NO.	1259.00	1485.62	154504.48
	TOTAL (II)			**25724.00**	**30354.32**	**3332201.72**
	GROSS TOTAL (I + II)			**2791474.00**	**3293939.32**	**112519880.28**

1.5 Cost Justification: For achieving least cost, P.O is placed on LOA i.e. Rahul Cables Pvt. Ltd. for Supply, installation, Commissioning, dismantling/replacement of SF6 RMUs. ***For copy of LoA, kindly, refer Annexure H, Pg. No. 26to 36 of 68.***

(C) Replacement of Old Switchgears:-11 kV OCB by 11 kV VCB at DSS (Qty- 396 Nos.):-

1. Technical justification for replacement of OCB to VCBs:

1.1 Technical justification: As per CEA Regulation, Clause No. 9, Sub Clause xii (4)-High Tension (HT) Switchgears, Sulphur Hexafluoride (SF6) / Vacuum Circuit Breakers (VCB) shall be provided for HT switchgears (11/6.6/3.3 kV)which shall be of draw out type, re-strike free, trip free, stored energy operated and with electrical anti-pumping feature. Further to this existing oil type RMU's or OCB's in distribution substations are of non-standard configurations and spares for these are not readily available. These are also more prone to failure and increase the O&M cost as well as safety hazards during operations as compared with their latest peers that are based on maintenance free SF6 / vacuum circuit breaker design offering much higher levels of personnel safety.

The OCB requires regular maintenance in terms of oil replacement and change of contacts at regular intervals. Whenever, any such maintenance activity is carried out, the circuit breakers are out of service for a long duration of time, making the network critical and affecting the reliability of supply to consumers.

Further, these OCBs are not suitable for energy auditing and distribution automation. As per MERC guidelines energy auditing of distribution transformers is mandatory. In order to incorporate distribution automation, it is necessary to replace OCB with Vacuum circuit breakers, which has the following advantages:

- Safe to operate
- Repeated maintenance expenditures on oil changing/filtering are eliminated
- Helps in reduced interruption of supply to consumers
- Suitable for Remote Operation (Distribution Automation)
- Reduce fire hazards

In view of above, Commission's in-principle approval is requested for proposed replacement of OCBs by VCBs as proposed in the Current DPR

1.2 OCB to VCB replacement (last 5 year data): The data is given in the following table.

Table 43: OCB to VCB Replacement last 5 year data

OCB to VCB Replacement	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
No. of DSS)	21	6	7	12.	-

1.3 Earlier Erection Central Department was handling following major activities:

Replacement of OCB to VCB

Replacement of Oil RMU to SF_6 RMU and

Replacement of ONAN Type DTs with Dry Type DTs.

Dry Type DTs are installed in such DSS that are part of Building to reduce fire hazards, etc. However, due to economic measures, the said department is dismantled and all activities carried out by erstwhile Erection Central have been entrusted to Erection North Department from December, 2015 onwards. Due to fewer workforces, estimated output of OCB to VCB replacement is suffered during above said period

1.4 BEST is more lagging in the process of replacement of Oil Type Switchgears / RMUs. At present there are about 539 Nos. of DSS having Oil Type breakers. Therefore, for improving quality of supply, BEST has proposed to replace all said 11 kV OCB to VCB at DSS under RDSS. However, PFC has approved 396 Nos. of (i.e. 1726 Nos. of VCB Panels of 11 kV OCB to VCB DSS as against 539 Nos. of DSS. Type wise breakers are given in the following table. For the list, kindly refer Annexure-AB.

Table 44: Type wise Switchgears

Normal Size Switchgears	Qty Proposed for Replacement	Compact Size Switchgears	Qty Proposed for Replacement	Total Proposed Qty
A	**B**	**C**	**D**	E = B +D
Type-A	188	Type-A	278	466
Type-B	518	Type-B	682	1200
Type-C	15	Type-C	36	51
Type-D	2	Type-D	7	9
Total Breakers	**723**	**Total Breakers**	**1003**	**1726**
Total DSS	**173**		**223**	**396**

1.5 Cost Sheet of replacement of OCB to VCB replacement scheme

Table 45: Cost Sheet of OCB to VCB Replacement Scheme

SR. NO.	PARTICULARS	Qty.	UNIT	BASIC RATE (in ₹)	BASIC RATE WITH GST (in ₹)	TOTAL COST WITH GST (in ₹)
A	B	C	D	E	G =1.18*F	H =C*G
I)	**Material Cost**					
1	**Normal** Type-A -11 kV, 250 MVA Non Trip Breaker suitable for Distribution Automation	188	NO.	404346	477128.28	89700116.64
2	**Normal** Type-B- 11 kV, 250 MVA feeder Breaker suitable for Distribution Automation	518	NO.	447326	527844.68	273423544.24
3	**Normal** Type-C- 11 kV, 250 MVA Bus Coupler suitable for Distribution Automation	15	NO.	398853	470646.54	7059698.10
4	**Normal** Type-D- 11 kV, 250 MVA HV Consumer Metering Breaker suitable for Distribution Automation	2	NO.	506102.	597200.36	1194400.72
5	**Compact** Type-A -11 kV, 250 MVA Non Trip Breaker suitable for Distribution Automation	278	NO.	404346.	477128.28	132641661.84
6	**Compact** Type-B- 11 kV, 250 MVA feeder Breaker suitable for Distribution Automation	682	NO.	447326.	527844.68	359990071.76
7	**Compact** Type-C- 11 kV, 250 MVA Bus Coupler suitable for Distribution Automation	36	NO.	398853.	470646.54	16943275.44
8	**Compact** Type-D- 11 kV, 250 MVA HV Consumer Metering Breaker suitable for Distribution Automation	7	NO.	5061102.	5972100.36	41804702.52
9	2 Nos. of Switchgear Earthing G.I. wire 55 SQ MM (7/11 SWG) with 120 sq mm Al Lugs at both ends with Average earthing wire of 25 meter (including both earthing at each DSS)	396	NO.	3150.00	3717.00	1471932.00
10	11KV CABLE 3C*240 SQMM, XLPE, AL	2192.31	MTR	2033.00	2398.94	5259218.34
11	11KV, 3CX240/300 SQ MM, XLPE Al. cable H. S / Epoxy Jt. Kits.	193	NO.	17325.00	20443.50	3945595.50
12	11KV, 3C×240 SQ.MM, H S St. Jt. Kit with Mechanical Connector Suitable for Al. conductor, Dry Cured, Water Swellable XLPE cable	1140	NO.	19950.00	23541.00	26836740.00

SR. NO.	PARTICULARS	Qty.	UNIT	BASIC RATE (IN RS.)	BASIC RATE WITH GST (IN RS.)	TOTAL COST WITH GST (IN RS)
13	11KV, 3C×240 SQ.MM, H S Term Kit Suitable for Al, Dry Cured, Water Swellable XLPE cable	200	NO.	4410.00	5203.80	1040760.00
	TOTAL MATERIAL			**8115122.00**	**9575843.96**	**961311717.10**
	ERECTION COST					
14	Dismantling of Existing Switchgears, B to B HT cable including material cost, Transportation	1726	NO.	7020.00	8283.60	14297493.60
15	Installation, Testing, Commissioning, of DT including Earthing connection, Transportation & misc material cost	1726	NO.	15810.00	18655.80	32199910.80
16	11KV, 3C*240 SQMM, XLPE, AL cable laying	2192.31	MTR	315.00	371.70	814881.35
17	Service for making of 11KV, 3CX240/300 SQ MM, XLPE /PILC, Al. cable H. S / Epoxy Jt. Kits.	170	NO.	1575.00	1858.50	315945.00
18	Service for making of 11KV, 3C×240 SQ.MM, H S St. Jt. Kit with Mechanical Connector Suitable for Al. conductor, Dry Cured, Water Swellable XLPE cable	1140	NO.	1575.00	1858.50	2118690.00
19	Service for making of 11KV, 3C×240 SQ.MM, H S Term Kit Suitable for Al, Dry Cured, Water Swellable XLPE cable	200	NO.	1259.00	1485.62	297124.00
	TOTAL ERECTION			**27554.00**	**32513.72**	**50044044.75**
	GROSS TOTAL in RS. (MATERIAL + ERECTION)			**8142676.00**	**9608357.68**	**1011355761.84**

1.6 Cost Justification: For achieving least cost, P.O is placed on LOA i.e. Rahul Cables Pvt. Ltd. for Supply, installation, Commissioning, dismantling/replacement of OCB to VCB DSS (mentioned in Table No. 29).***For copy of LoA, kindly, refer Annexure H, Pg. No. 26to 36 of 68.***

(D). Replacement of Oil Ring Main Units by SF6 Ring Main Units Qty-95 Nos.

1. Technical justification for replacement of Oil RMU by SF6 RMU:

1.1 For technical justification, kindly refer Section-2, Item (C), Para 1.1

1.2 Oil RMU to SF6 RMU replacement (last 5 year data): The data is given in the following table.

Table 46 : Oil Type RMU to SF6 RMU Replacement Data

Oil Type RMU Replacement	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
No. of RMUs	3	1	2	1	1

1.3 Kindly refer Section-2, Item (C), Para 1.3.

1.4 Earlier BEST has not take efforts for replacement of Oil Type RMUS. At present there are about 118 Nos. of DSS having Oil Type RMUs. Therefore, for improving quality of supply, BEST has proposed to replace all said 11 kV Oil Type RMUs at DSS under RDSS. However, PFC has approved only 95 Nos. of 11 kV Oil Type RMUs as against 118 Nos. *For total list of Oil Type RMUs, kindly refer Annexure-AC.*

1.5 Cost Sheet of Oil Type RMUs to be replaced with SF6 RMUs

Table: 47 Cost Sheet of Oil Type RMUs to be replaced with SF6 RMUs

SR. NO.	PARTICULARS	Qty.	UNIT	BASIC RATE (in ₹)	BASIC RATE WITH GST ((in ₹)	TOTAL COST WITH GST (in ₹)
A	B	C	D	E	G =1.18*F	H =C*G
I)	**MATERIAL COST**					
1	RMU 3-Way (1 ISO + 1 T-OFF+ 1 FDR.)	82	NO.	770313.00	908969.34	74535485.88
2	RMU 4-Way (1 ISO + 1 T-OFF+ 2 FDR.)	5	NO.	992922.00	1171647.96	5858239.80
3	RMU 4-Way (1 ISO + 2 T-OFF+ 1 FDR.)	8	NO.	992922.00	1171647.96	9373183.68
4	2 Nos. of Switchgear Earthing G.I. wire 55 SQ MM (7/11 SWG) with 120 SQ MM Al Lugs at both ends with Average earthing wire og 25 meter (including both earthing at each DSS)	95	NO.	3150.00	3717.00	353115.00
5	11KV Cables 3C*240 SQMM, XLPE, AL	525.93	MTR	2033.00	2398.94	1261681.17
6	11KV, 3C×240 SQ.MM, H S Term Kit Suitable for Al, Dry Cured, Water Swellable XLPE cable	95	NO.	4410.00	5203.80	494361.00
	TOTAL MATERIAL COST			**2761340.0**	**3258381.20**	**91381705.53**
II)	**ERECTION COST**					
7	Dismantling of Existing Switchgears, B to B HT cable including material cost, Trans.	95	NO.	8400.00	9912.00	941640.00
8	Installation, Testing, Commissioning, of RMU including Earthing connection, Trans & misc material cost	95	NO.	15750.00	18585.00	1765575.00
9	11KV, 3C*240 SQMM, XLPE, AL cable laying	525.93	MTR	315.00	371.70	195489.21
10	Service for making of 11KV, 3C×240 SQ.MM, H S Term Kit Suitable for Al, Dry Cured, Water Swellable XLPE cable	95	NO.	1259.00	1485.62	141133.90
	TOTAL ERECTION COST			**24465.00**	**28868.70**	**2902704.21**
	GROSS TOTAL (I +II)			**2785805.0**	**3287249.90**	**94284409.74**

1.5 Cost Justification: For achieving least cost, P.O is placed on LOA i.e. Rahul Cables Pvt. Ltd. for Supply, installation, Commissioning, dismantling/replacement of OCB to VCB DSS. ***For copy OF LoA, kindly, refer Annexure H, Pg. No. 26 to 36 of 68.***

(E) Renovation/Augmentation of 11 kV and 1.1 kV cables (HV/LV Lines),

1. **Replacement / additional of HV weak/Old cable with 3CX240 SQ.MM XLPE Al cables (Qty-203 Km) and Replacement / additional of LV weak/Old cable with LV 4CX300 SQ.MM XLPE Al cables (Qty-50 Km)**

1.1 Basic Objective of the Scheme:

The basic objective of the scheme is to meet the existing and future load in the distribution area of the licensee, Revenue from new customers, to build and maintain adequate redundancy in the system, to reduce distribution losses by reducing H.T. as well as L.T. line length and locating DSS near to load centre i.e. consumer premises, to enhance safety, attaining better voltage profile, to provide reliable and quality power supply to all consumers.

1.2. Technical justification for laying/replacement of 11 kV HV cables:

11 kV HV Cables are used to interconnect DSS with RSS. It is proposed to lay / replace 11 kV HV cable under the current scheme for achieving the following benefits:

(a) Interconnection will ensure in transmitting load across various RSS

(b) By interconnection, timely maintenance of the equipments can be undertaken

(c) Ease of restoration of power supply, hence it helps to improve in reliability

(d) Reduce technical losses and Voltage profile in the system will be improved.

(e) Revenue from new customers

(f) Additional capacity to meet new load

1.3. Technical justification for Laying /replacement of LV Cable:

The LV cable is used to interconnect DSS with the pillars. It is proposed to lay the LV cable under the current scheme for achieving the following benefits:

(a) Interconnection will ensure in transferring load across various DSS

(b) By interconnection, timely maintenance of the equipments can be undertaken

(c) It will ensure in providing uninterrupted power supply to the consumers

(d) It will reduce distribution losses

(e) Voltage profile in the system will be improved

1.4 Detail technical justification for replacement of 11 kV HV and 1.1 kV LV cables:

Details about Parameters considered and components of field study/TC/NOC carried out by BEST and results of the field study, based on which, BEST has proposed to install new DSS and augment/replace transformers is as follows:-

(i) There exists procedure order 90 D for deciding substation requirement based on plot area and estimated electrical load demand which is further depends upon build up area, type of premises, essential equipments etc. It also depends on adjoining electrical network condition. If substation is required then new DSS is proposed in party's premises otherwise party's electrical load demand is fulfil from adjoining network, it may involve cable laying or augmentation of transformer in nearby existing DSS. ***For Copy of PO 90D, kindly refer Annexure F.***

(ii) The number of requisitions received and projected for supply as shown in the following Table:

Table 48: New connections requisitions data

Description	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
Number of requisitions for supply	41,722	38,052	24,379	27400	38,260

(iii) Single line diagrams of laying of cables: - The 11 kV HV cable is to be laid from 11 KV Bus sections of RSS to the 11 KV Bus sections of DSS. Also from 11 KV Bus section of one DSS to 11 KV Bus section of another DSS as Inter connector. Similar way, LV cable is to be laid from one DSS L. V. Board/ADP to another DSS's LV Board/ADP as an interconnector. Also from one DSSL.V. Board/ADP to ADP as a distributor. LV cable is also to be laid from one ADP to another ADP as a inter connector. Service cables are to be laid up to consumers meter cabin from DSS LV Board/ADP or from outside ADP. ***The SLD of entire BEST (11 kV Radial diagram) is attached as Annexure-AD.***

(iv) Name of DSS for both ends of the cables proposed: 11 kV HV cable is to be laid in between two DSS having voltage level of 11 KV and 1.1 kV LV cable is to be laid in between either one DSS LV Board / ADP and another DSS LV Board / ADP or one DSS LV Board / ADP and ADP or ADP to ADP having voltage level of 415 V.

Schemes are prepare based on various factor such as for augmenting the existing capacity of DSS, Strengthening of 11kV HV and 1.1 kV LV network for giving load relief form overloaded network, to improve reliability and flexibility of network whenever required in any area within the distribution network of BEST, network flexibility required for maintenance point of view and also one of the core factor based on the load demand from the applicant/ consumer.

Based on the above and to meet load demand of particular area / location / cluster, the required Investment Schemes is to be prepared.

In Mumbai City a lot of development work is in progress at various locations. Considering load demand from consumers, spare capacity on existing network Capital Schemes are to be prepared. Before starting of fair season, every year BEST undertaking submits cable laying plans to MCGM for obtaining permissions for excavation on Footpath/Road etc. There are lot of factors which affects work of execution of Capital Investment Scheme like if road footpath is recently developed then in 1st year 4 times, 2nd year 3 times, 3rd year 2 time and balance years after completion of defect liability period, one time Re-instatement (RI) Charges are to be paid to concern Authority like MCGM for obtaining exaction permission. For curtailment of excessive R.I. Charges, BEST undertaking plans cable laying Schemes in advance in co-ordination with MCGM.

(v) Detailed features of XLPE cables are as below:

Table 49: Details of HV LV XLPE cables

Voltage Level / Conductor /Type	Cable Size in sq. mm.	Rating (Ground) in Amps	Useful Life Depends on
11 kV /Al. /XLPE	3C X 240	335	UG Soil condition
1.1 kV / Al. XLPE	4C X 300	367	UG Soil condition

UG-Underground

(vii) Existing population of HV Cables and LV cables as on 31.03.2023 and past 5 year Data for the same is given in the following Tables:

Table 50: Existing population of cables and pillars

Sr. No.	Item Name	As on 31st March 2023
1	11 kV HV cable (in KM)	2213
2	**1.1** kV LV cable (including service cable) -in KM	9340
3	ADPs / Pillars (in Nos.)	9057

Table 51: Past 5 Years Data of HV Cable, LV Cable and Pillar

Sr. No.	Description	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23
1.	11 kV HV Cable	26	29	29	21	35
2.	# 1.1 kV LV Cable	73	74	61	56	103

Excluding service cable

(vii) **Factors to be considered while preparing new Capital Schemes**: While preparing new Capital Schemes following main points are to be taken into account.

Existing network parameters i.e. present loading, size of the cable, distance between feeding point, distance of load form the feeding point, Existing capacity of the transformer etc.

For overloaded cables new cables are to be laid and thereby transferring the load from one cable to another cable which will reduce technical losses due reduction in length and sharing of load. Also old transformers are to be replaced by new transformer with lower losses.

1.5 Reduction in distribution loss: While preparing new schemes, existing network parameters are also considered i.e. present loading, size of the cable, distance between feeding point, and distance of load from the feeding point, existing capacity of the DT etc. For overloaded cables new cables are laid and thereby transferring the load from cable to another cable which will reduce technical losses due reduction in length and sharing of load. Also old DTs are replaced by new DTs with low losses.

1.6 As per Capex Regulation, 2022, the useful life of cables used for distribution of power supply shall be 25 years. BEST has proposed to replace about 203 Kms of 11 kV, 3CX240 SQ MM Al XLPE cables under RDSS. These cables have already completed their useful life of 25 years. Most of the cables under replacement had completed even 50 years of life also.

1.7 Reinstatement Charges and Way leave Charges

BEST has well developed an underground cable network in its licence area of distribution, Mumbai. In Mumbai all Distribution cable network is underground type and therefore, for laying of 11 kV cable, BEST has to pay Reinstatement Charges (RI Charges) to the MCGM / MHADA/ MMRDA /MPT.

Some of the cables are also passing below railway track i.e. Harbour line, Main line and Western line. Now, Railway authority is also insisting for paying way leave charges when cables are passing below railway track.

These RI Charges and way leave charges also contribute to the cost of cable laying activity. In the current RDSS DPR, As per RDSS Guidelines, 100% RI charges and way leave charges are to be paid by BEST to the concern authority such as MMRDA, MCGM, and MHADA etc.

1.8 Cost Sheet of replacement of 11 kV,3CX240 SQ MM Al XLPE cable:

Table 52: Cost estimation Sheet of 11 kV cable **Amount in Rs.**

SR NO.	DESCRIPTION	QTY	UNIT	RATE/ UNIT (in ₹)	AMOUNT (in ₹)	TOTAL (in ₹)
A	**Total Material Charges = 1 + 2**					
1)	**Material**					
i	11 kV 3CX240 sq.mm Al. XLPE cable. (M/s.Rahul Cables)	1000	MTR	2033.00	2033000.00	
iii	Laying material for cable. (HT Tiles)	3330	MTR	53.55	178321.50	
iv	Supply of 160 mm HDPE Pipe including Transp, Jointing, Handling,etc.	100	MTR	2310.00	231000.00	
iv	11 kV, H.S Type Straight joint XLPE-XLPE	3	NOS	19950.00	59850.00	
v	11kV, H.S Type Terminations Kits	0	NOS	4410.00	0.00	2502171.50
B	**Total Labour Charges**					
i	11 kV, H.S.Straight joint work. Al. XLPE	3	NOS	1575	4725.00	
ii	11V, H.S Terminations Kits	0	NOS	1259	0.00	
iii	Pulling through pipes/ trench.	100	MTR	418	41800.00	
iv	Excavation, Backfilling and laying 1 cable on Road	1000	MTR	1650	1650000.00	1696525
C	**Supervision Charges: Nil**					
D	**Total Material & Labour Charges = A+B+C**					**1696525.00**
E	**Total Permanent reinstatement charges = RI charges x M.F. of RI**	RI Charges			M.F.	

ii	**Excavation on Road (Mastic Asphalt 25 mm thick)**	1000	MTR	**13,660**	0.7	9562000	9562000
F	**Additional Deposits on R.I. =0 % of E**						
G	**Total Estimated Cost = D + E + F**						11258525
H	**Contingency = 5% of G**						0
I	**Net Estimated Cost = G + H (To be rounded off)**						**11258525.00**
					Total Excluding GST		11258525
J	18% GST						**2026534.50**
K	**Total per KM laying of cable cost**					**in Rs**	**13285059.50**
L	**Total Costing for laying of 200 KM**						**2657011900.**
M	**HDD work for cable laying**						
	Material Cost						
i	600 MM Pipe	247	MTR	13650		3371550	
ii	160 mm Pipe in 600 mm pipe	1480	MTR	2310		3418800	
iii	Cable Markers	5	NOS	6822.50		34112.5	
	Services						
i	Crossing Road	1015	MTR	3675		3730125	
ii	Crossing Railway Track	247	MTR	44225		10923575	
iii	600 MM Pipe	1480	MTR	210		310800	
iv	160 mm Pipe in 600 mm pipe	1480	MTR	418		618640	22407602.50
	18% GST on HDD Work						4033368.45
	Total Cost of HDD work with GST						**26440970.95**
	Grand Total cost of cable laying in Rs. (L + M)						**2683452870.95**
	Total cost of cable laying in Rs Cr.						**268.35**
As per P O placed on M/s Rahul cables							
Note: Length of HT Tile =300 mm, Tiles per meter =1000/300= 3.33 Nos. It is assumed that in one trench 2 to 3 cables are to be laid, RI Factor is considered as 0.7 instead of 2.							

1.9 Cost Sheet of replacement of 1.1 kV, 4CX300 SQ MM Al XLPE cable:

Table 53: Cost estimation Sheet of 1.1 kV, 4CX300 sq. Mm cable **Amount in Rs.**

SR NO.	DESCRIPTION	QTY	UNIT	RATE/ UNIT (in ₹) `	AMOUNT (in ₹)	TOTAL (in ₹)
A	**Total Material Charges = 1 + 2**					
1)	**Material**					
i	1.1 kV, 4CX300 sq.mm Al. XLPE cable.	1000	MTR	1565.00	1565000.00	
iii	Laying material for 11 kV cable. (LT Tiles)	4440	MTR	42.00	186480.00	
iv	Pipes.OD 200 mm	100	MTR	2310.00	231000.00	
iv	1.1 kV, H.S Type Straight joint XLPE-XLPE	3	NOS	18060.00	54180.00	
v	1.1kV, H.S Type Terminations Kits	1	NOS	2835.00	2835.00	2039495.00
B	**Total Labour Charges**					
i	1.1 kV, H.S.Straight joint work. Al. XLPE	3	NOS	1590	4770.00	
ii	1.1V, H.S Terminations Kits	1	NOS	1574	1574.00	
iii	Pulling through pipes/ trench.	100	MTR	418	41800.00	

iv	Excavation, Backfilling and laying 1 cable on Road	1000	MTR	1650	1650000.00		1698144
C	**Supervision Charges: Nil**						**0**
D	**Total Material & Labour Charges = A+B+C**						**1698144.00**
E	**Total Permanent RI Charges = RI Charges X M.F. of RI**	RI Charges			M.F.		13660000
ii	Excavation on Road (Mastic Asphalt)	1000	MTR	**13,660**	1	13660000	
F	**Additional Deposits on R.I. =0 % of E**						
G	**Total Estimated Cost = D + E + F**						15358144
H	**Contingency = 5% of G**						0
I	**Net Estimated Cost = G + H (To be rounded off)**						15358144
					Total Excluding GST		15358144.00
J	18% GST						2764465.92
K	**Total per KM laying of cable cost in Rs**						**18122609.92**
L	**Total LV cable laying cost for 50 Km**	**50**	**KM**				**906130496.00**
	Total LV cable laying cost in Cr.						**90.61**
As per P O placed on M/s Rahul cables							

3. Estimated Costing of the DSS Scheme

Table 54: Estimated Costing of the DSS Amount in RS.

Sr. No.	Name of Scheme	Cost ₹ in Cr.
A	Replacement of DTs (Qty-666 Nos.)	2101582230.19
B	Replacement of SF_6 RMUs (which are not compatible for Distribution Automation) (Qty-104 Nos.)	112519880.28
C.	Replacement of Oil Filled RMUs by SF_6 RMUs compatible for Distribution Automation) (Qty-95Nos.)	94284409.74
D.	Replacement of Oil Type switchgears by VCB switchgears compatible for Distribution Automation) (Qty-396 Nos.)	1011355761.84
E1.	Replacement /Additional of 11 kV HV weak/old cable with 3CX240 SQ Mm XLPE cable (200 KM)	426820870.95
E2	RI Charges, 200 kM	2256632000.00
F1	Replacement /Additional of 1.1 kV LV weak/old cable with 4CX300 SQ Mm XLPE cable (50 KM)	100190496.00
F2	RI Charges, 50 kM	805940000.00
G	PMA Charges	58751262.40
	GRAND TOTAL	**6968076911.40**

For Cost Estimation, kindly refer Annexure-AE.

4. Cost Benefit Analysis (CBA):

The benefits of the capital expenditure proposed to be incurred under this scheme may be divided into two; namely- Tangible benefits and Intangible benefits.

The expense heads under this scheme contain both developmental costs i.e., those incurred for network augmentation and non developmental costs i.e., those incurred for network maintenance which do not directly contribute to increased sale of power. However, these expenses too are necessary for reliability of power supply in the long run and hence have been included in the cost benefit analysis given below.

Although the benefit of the augmentation will accrue for the entire life of the equipment installed, they have been projected for a period of 5 years only.

Tangible Benefits:-

(i) Benefits due to replacement of age old switchgears / RMUs: -In the current Capital Schemes, tangible benefits are not only limited to additional sales of units but also, due to execution of Capital Schemes there is lot of saving in distribution losses. Tangible benefits can be achieved by replacement of age old 11 kV, 250 MVA Oil Type Switchgears and RMUs. Due to reduction in off supply period, considerable amount of cost will be saved. Further to this, it will improve reliability and quality of power supply.

(ii) We have tested 2 Nos. of DTs of same rating i.e. 630 kVA; it is found that losses of DTs are increased by 39% to 40% of the losses at the time of purchase. For loss estimation purpose, it is assumed that 39% losses of each DT are increased as against the total losses at the time of purchase. ***For details, kindly refer Annexure-AF, Pg. No.1.***

(iii) Existing Dry Type and ONAN Type DTs are more than 30 years old. It is estimated that about Rs. 23.21 Cr (ONAN Type DT -21.94 Cr & Dry Type DT -1.27 Cr) cost will be saved against up-gradation/replacement of 666 Nos. of DTs under RDSS. ***For detail calculation, kindly refer Annexure-AF, Pg. No.2 to 3.***

(iv) Tangible Benefits due to replacement of age old 33 kV, 11 kV and 1.1 kV cables: Existing PILC/XLPE cables are more than 30 years old & having number of joints resulting increase in **I^2R loss**. It is estimated that about **Rs. 12.02 Cr** (11 kV cable, 200 kM, Rs. 9.99 Cr & 1.1 kV cable, 50 kM, Rs. 1.50 Cr) cost will be saved against up-gradation HV & LV cables under RDSS. ***For detail calculation, kindly refer Annexure-AG.***

4.2 Tangible benefits due to revamping of DSS:

BEST has proposed to replace 666 Nos. of DTs. Most of the DTs are to be replaced with same capacity, however 3 Nos. of 995/1000 kVA DTs will be replaced by 1600 kVA DTs as per network requirement. Total capacity addition for FY2023-24 up to FY 2026-27 is given in the following Table:

Table 55: Capacity addition due to Higher Rating Replacement

Capacity Addition (MVA)	FY 23-24	FY 24-25	FY 25-26	FY 26-27
Revamping of DSS (MVA added)	0.6	0.6	0.6	-

Augmentation of existing DSS is being undertaken by installation of higher capacity DTs. Details of MVA capacity addition is given in the following Table:

4.3 Revenue due to additional sales:

Table 56: Data for calculation of revenue from additional sales

Sr. No.	Particulars	Unit	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
1	Capacity addition	MVA	0.60	0.6	0.60	-	-
2	Average P. Factor	-	0.99	0.99	0.99	0.99	0.99
3	RoE / unit	**Rs/unit**	0.3013	0.2961	0.2961	0.2961	0.2961

4.3.1 Calculations:

Projections for the additional revenue accrued due to potential additional sales for a 5 year period is given below:

Table 57 Calculation of revenue from additional sales

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Cumulative capacity commissioned (MVA)	**0.6**	**1.20**	**1.80**	**1.80**	**1.80**
Incremental loading	20%	30%	40%	50%	60.04%
Distribution losses	4.18%	4.18%	4.18%	4.18%	4.18%
System power factor	0.99	0.99	0.99	0.99	0.99
Additional sales (MU)	1.00	2.49	4.49	5.98	7.48
RoE per Unit (Rs/ unit)	0.3013	0.2961	0.2961	0.2961	0.2961
Total revenue (Rs. Crore)	0.03	0.07	0.13	0.18	0.22

1. For calculation purpose, it is assumed that either in RSS or DSS new transformer is commissioned either by commissioning of RSS/DSS or replacements of transformer with higher capacity at RSS/DSS, in the 1st year transformer will be loaded at 20%, in 2nd year transformer will be loaded at 30%, 3rd year at 40% rate, 4th year at 50% rate and finally at 5th year transformer will be loaded at equivalent to the average load factor i.e. 60.04 % (system average load factor).

2. In the Current DPR, 1st year 0.6 MVA capacity added with 20% loading. In 2nd year new 0.6 MVA capacities will be added, therefore 0.6 MVA with 20% and 0.6 MVA with 30% loading. In 3rd year new 0.6 MVA will be added, therefore 0.6 MVA with 40%, 0.6 MVA with 30% is loading and 0.6 MVA with 20% loading. In 4th year NIL capacity will be added, therefore 0.6 MVA with 50%, 0.6 MVA with 40%, 0.6 MVA with 30% and NIL MVA with 20% loading. Finally in 5th year new NIL MVA will be added, therefore 0.6 MVA with 58.01, 0.6 MVA with 50%, 0.6 MVA with 40%, NIL MVA with 30% and NIL MVA with 20% is loading.

3. **Calculation for estimating the additional units sold is given below**:

   No. of units realized in FY 2023-24 due to addition in MVA capacity

   = Load * P. F. * Incremental load * No. of hours per day * No. of days * (1-Distribution Loss)

= 0.6* 0.99 * 20% * 24 * 365 * 1000 * (1-4.18%)/10^6 = 0.9972MUs.

4. No. of units realized in FY 2024-25 due to addition in MVA capacity
= Load * P. Factor * Incremental load * No. of hours per day * No. of days * (1-Distribution Loss)

= 0.6* 0.99 * 20% * 24 * 365 * 1000 * (1-4.18%)/10^6 (81.14 MUs) + 0.6*0.99*30%*24*365*1000*(1-4.18%)/10^6 (120.16 MUs) = 2.49 MUs.

5. Based on the above calculations the total benefit that can be accrued from the proposed capital expenditure under this scheme is as below:

Table 58: Benefits from scheme

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Revenue due to additional sales (₹ in Cr.)	0.03	0.07	0.13	0.18	0.22
Revenue realised in ₹ Cr.	0.03	0.07	0.13	0.18	0.22

4.4 Intangible benefits:

The augmentation at existing DSS by replacement of transformers, OCB to VCB switchgears and Oil Type RMUS with SF_6 RMUs would help in providing reliable and quality and fast restoration of electric supply to its consumers and enhance the safety of operating personnel. Although no additional capacity addition or units sales are achieved it helps in reducing the breakdowns / outages and thereby reduces the distribution losses in the system along with Distribution Automation.

Summary of the Savings due to up-gradation of Distribution Infrastructure:

Table 59: Summary Sheet of benefits **Amount ₹ in Cr.**

Sr. No.	Particulars	FY23-24	FY24-25	FY 25-26
1.	Replacement of 11 kV & 1.1 kV cables	34.47	34.47	34.47
3.	Augmentation of DSS	0.03	0.07	0.13
4.	Replacement of age old DTs	23.21	23.21	23.21
	GRAND TOTAL SAVING in Cr.	**57.71**	**57.75**	**57.81**

5. Phasing of Capital Expenditure:

The projected capital expenditure of ₹584.72 Cr. for the schemes to be executed during five years is as given below.

Table 60: Phasing of Capital Expenditure Amount in ₹ in Cr.

Particulars	Total	Phasing of Capital Expenditure		
		23-24	24-25	25-26
Total CAPEX with PMA	696.81	161.95	267.40	267.46
Total Capitalization with PMA	696.81	161.95	267.40	267.46
PFC Approved CAPEX	447.73	106.83	170.45	170.45
PFC Approved Capitalization	447.73	106.83	170.45	170.45
Approved PMA Charges	6.72	1.60	2.56	2.56
60% Grant on PMA Charges	4.03	0.95	1.54	1.54
60% Grant on CAPEX	268.64	64.10	102.27	102.27
Capitalization with Grant	268.64	64.10	102.27	102.27
Total Grant with PMA	**272.67**	**65.05**	**103.81**	**103.81**

APPENDIX-2

1. Part1:

Part-I: Particulars of DSS furnished in the over view of the DPR

1.1.	**Name of Applicant**: BEST (Brihanmumbai Electric Supply & Transport undertaking)
1.2.	**Name of the Capital Investment Work**: Renovation/Augmentation of Infrastructure at Distribution Substations
1.3.	**Nature of CAPEX Scheme (Revised):** Revised RDSS DPR Scheme on “Distribution Substation related Infrastructure works under loss reduction” is submitted as per MERC (Approval of Capital Investment Schemes) Regulations, 2022.
1.4.	**Details of the Location**: Mumbai circle (BEST’s Licensee Area)
1.5	**Date of Approval by Competent Authority designated by the Board of Directors of the Company**: *A copy of management approval for RDSS Scheme including “Implementation of Infrastructure works under Loss Reduction” is enclosed as* ***Annexure- E (BCR Copy), 27-37 of 78.***
1.6.	**Category of DPR**: This DPR Scheme falls under Regulation 3.9 of MERC (Approval of Capital Investment Schemes) Regulations, 2022. Category are as follows: 3.9 (a) Infrastructure required for releasing new supply connections. (b) System strengthening by enhancing capacity of inter-alia, Sub-station, cables, and Circuit Breaker, to mitigate overloading or to provide redundancy or to improve voltage profile or reduce losses; (e) Capital Nature Schemes funded partially by Central or State Government Grants; (h) Capacity augmentation of distribution lines and transformers at existing DSS or RSS; (i) Improvement in quality of supply & reliability of distribution system. (j) Emergency Restoration System involving asset replacement; (o) Improvement in consumer services and (p) Obsolescence of assets and absence of support from OE Manufacturer
1.7.	Objective of the Capital Investment: (i) The basic objective of the scheme is to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25. (BEST had already achieved this target. BEST’s Distribution loss is less than 5%). Further, objective is to reduce ACS- ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMS and for improvement in the quality, reliability and affordability of power supply to the consumers through a financially sustainable and operationally efficient Distribution Sector. This can be achieved by replacing age old outlived T/Fs, cables and associated equipments, also to replace age old/ obsolete 33 kV & 11 kV switchgears. (ii) 24x7 power supply for consumers in Mumbai City. (iii) Reduction of AT&C losses/maintaining of existing low level of AT&C losses (iv) To maintain reliability and quality of Electric Supply to the Consumers.
1.8	**Need of Analysis**: GoI has launched RDSS to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25. To meet this objective GoI has approved the schemes of replacement of age old T/Fs, Switchgears and cables. For improvement in the quality, reliability and affordability of power supply to the consumers it is necessary to replace age old T/Fs, Switchgears and cables etc.
1.9	**List of Identical schemes previously approved by the Commission and their progress report (5 years data):** First time BEST is implementing the Schemes for Loss Reduction under RDSS. Hence, no previous records of such schemes.

1.10.	**State Map showing Location of the Scheme (for Transmission)**- Not Applicable
1.11.	**Brief scope and specification of work**: Renovation/Augmentation of infrastructural work of Power /Receiving Substations. (i) Augmentation of substations (additional / replacement of 995 kVA Distribution Transformers with associated equipments/accessories (Qty-666 Nos.). (ii) Installation /replacement of New Ring Main Units i.e. RMUs (Qty-104 Nos.) (iii) Replacement of 11 kV OCB switchgears to VCB switchgears at DSS (Qty-396 Nos.) (iv) Replacement of Oil Ring Main Unit by SF6 Ring Main Units at DSS (Qty-95 Nos.) (v) Replacement of (weak/old) / additional laying of 11 kV, 3CX240 SQ.MM Al XLPE cable (203 KM) and Replacement of (weak/old) / additional laying of LV, 4CX300 SQ.MM Al XLPE cable (50 KM) ***For copy of Specifications of above items, kindly refer Annexure-AH.***
1.12.	**Any Reference of Study Report / recommendation of OEM/Expert:** N.A for this DPR.
1.13.	**Estimated Cost**:Rs.696.81 Cr. (FY 2023-24–161.95Cr., FY 2024-25–267.40 Cr. and FY 2025-26-267.46 Cr.)IDC is not included in the costing. ***A copy of Cost Sheet enclosed as Annexure-AE.***
1.14.	**Time Frame of the expenditure:** Project completion Period 36 months. Table 61: Time frame of Capex (DSS)

Financial Year	Capex Expenditure (in Rs.)	Capitalisation (in Rs.)
2023-24	161,95,08,651.64	161,95,08,651.64
2024-25	267,40,11,667.82	267,40,11,667.82
2025-26	267,45,56,591.94	267,45,56,591.94
TOTAL	**696,80,76,911.40**	**696,80,76,911.40**

For time frame, Kindly refer Annexure-C, RDSS Guidelines.

1.15. **Funding arrangement: For FY2023-24toFY 2031-32 (for 9 years from the date of contract).**

Table 62: Funding Arrangement (DSS)

Sources of Funds	Amount (in Crs.)	Share (%)
Debt (30% of balance cost)	381.73	55
Equity (10% of balance cost)	42.41	6
Grant (60% of approved cost)+PMA	**272.67**	39
Consumer Contribution/Deposit Works	-	-
Total	**696.81**	**100**

Please kindly note that PFC approved cost of RSS project with PMA cost is Rs. 454.45 Cr. and Grand of Rs. 272.67 Cr. Shall be made available from GoI for this project which is 60% of approved cost (including PMA Grant).

1.16 **Benefits/Impact on DSS Schemes**:

- There is saving in distribution losses. Improved billing Accuracy.
- It will generate additional revenues.
- It will improve reliability and quality of power supply.

Impact on tariff by considering 60% Grant and without Grant is given below:

Table 63: Tariff impact with and without GBS (Grant)

F .Y.	23-24	24-25	25-26	26-27	27-28	28-29
With Grant	0.0193	0.0671	0.1246	0.1483	0.1418	0.1364
Without Grant	0.0323	0.110	0.2049	0.2436	0.2330	0.2240

Tariff impact with Grant and without Grant is worked out and same is shown in the above table.

For tariff impact with and without Grant, kindly refer Annexure-AI &Annexure-AJ, respectively.

1.17. **Overall Cost-benefit Analysis**:Benefits from RSS project schemes

Table 64: Revenue due to additional sales   Amt in Cr.

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Revenue due to additional sale	0.03	0.07	0.13	0.18	0.22
Revenue realized (Rs. in Cr.)	0.03	0.07	0.13	0.18	0.22

For overall Cost-Benefit, Kindly refer Annexure-AF.

2. **PART-II: (Particulars of DSS furnished for justification of works)**

2.1	**Need of the investment**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' are to achieve an efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like high AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas being concentrated by the government for the development of country. The government has taken initiatives for (i) complete revamping of power sectors electrical equipment across the country and (ii) for the need of changing the way of operation and control of the electrical equipment. Accordingly,, Govt. of India has launchedthe Revamped Distribution Sector Scheme (RDSS) to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. The Scheme would be available till the year 2025-26. REC and PFC have been nominated as nodal agencies for facilitating implementation of the Scheme. Accordingly, Power Ministry of Govt. of India has issued guidelines for implementation of RDSS **Objective of the scheme:** There is addition of new consumers due to development of Coastal Road, Mill and SRA Schemes, EV Charging, Sewree bridge, Redevelopment of Plots etc. In order to meet the requirement of new Consumers for releasing new Load, Smart Meters are required installed. • 24x7 power supply for consumers in Mumbai City • Reduction of AT&C losses/maintaining of existing low level of AT&C losses • To maintain reliability and quality of Electric Supply to the Consumers.
2.2	**Time lines of the Project:** **(i)** As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.1), project approval date was 31.03.2023. As per guidelines BEST had prepared Action Plan and DPR for FY 2023-24, FY2024-25 & FY2025-26 by considering the audited annual accounts for FY 2019-20 & FY2020-21 and submitted to the Executive Director (IPDS), PFC on 22.08.2022.

	As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.2), the last date for completion of this scheme will be 31.03.2026. The works executed beyond this time lime will not be eligible for getting grant of GoI. ***For time-line of RDSS, kindly refer Annexure-C, Pg. No. 16-17 of 32.***
2.3	**Scheme for revised approval/scope/cost**: This Scheme is New One and is submitted as per MERC (Approval of Capital Investment Schemes), Regulations 2022.
2.4	**Proposed Capital Investment Scheme**: Proposed Capital Investment includes replacement of age old DTs, 11 kV Oil Type switchgears and RMUs, 11 kV SF_6 RMUs for Automation, age old 11kV & 1.1 kV cables. In this DPR, capital investment is proposed to be executed as per MERC CAPEX (Approval of Capital Investment Schemes) Regulation. 2022.
2.5	**Technical Justification**: 1. Govt. of India has launchedthe RDSS to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. 2. **MYT Regulation:** As per Clause No. 74.1 of MYT Regulation 2019, BEST has submitted DPR for strengthening and augmentation of its distribution network meeting the requirement of load growth, reduction in distribution losses, improvement in quality of supply, reliability, reduction in congestion, etc. 3. As per Capex Regulation, 2022 Clause, 3.9, (e) Capital Nature funded schemes partially by Central Government of India. (h) Capacity augmentation of DSS by installing some higher rating DTs & replacing old DTs, (i & o) Improvement in quality and reliability of distribution system and improvement in consumer services at both DSS. **4.** Life of all electrical equipments and cables consider in the DPRhad been completed and for safety point of view it is proposed for replacement.
2.6	**Financial Justification:** 1. As per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilize internal funds for executing all its Capital Expenditure plans. But due to financial crunch for in house schemed Best has decided to utilize 30% equity from internal sources and balance debt portion of 70% will be borrowed from financial institutions such as REC, PFC, Banks, etc.

	2. In RDSS Project, for infrastructure works, GoI has sanctioned 60% Grant against sanctioned DPR Cost. For Distribution Substation Infrastructure Works, GoI has approved Rs.268.64 Cr Grant as against approved project cost of Rs. 447.73 Cr. Further to this, Rs. 6.03 Cr. amount is sanctioned for PMA and Grant against this PMA cost will be Rs. 4.03 Cr. So, total Grant available for RSS project will be Rs. 272.67 Cr. 3. For execution of RSS project actual cost arrived by tendering process is Rs.696.81 Cr including RI cost. Out of which Rs.272.67 Cr will be the grant amount and balance Rs. 424.14 Cr will be the amount which will be borne by BEST. Out of Rs. 424.14 Cr., equity amount will be 10% i.e. Rs 42.41 Cr. and balance 90% amount of Rs. 381.73 Cr. Will be made through debt. 4. BEST has applied to REC for loan amount for execution of RDSS.
2.7	**Consent of M-DNAC**: As per Electricity Act, 2003, Clause, 42(3), BEST undertaking being a local authority, hence exempted from open Access.
2.8	**Plan of other Transmission Licensees / CTU**: DPR is related to Distribution Licensees, hence Not Applicable.
2.9	**Phasing of Investment** :
2.10	**Statutory/Safety Requirement: N.A**
2.11	**Cost Assessment /Cost Break-up**:

Table 65: Phasing of the Capital Investment (DSS)

FY	Capex Expenditure (in Rs. Cr)	Capitalisation (in Rs. Cr)
2023-24	161.95	161.95
2024-25	267.40	267.40
2025-26	267.46	267.46
TOTAL	**696.81**	**696.81**

Table: 66: Cost break-up of DSS items

Sr. No.	Name of Scheme	Total Cost (in Cr.)
A	Replacement of DTs (Qty-666 Nos.)	**210,15,82,230.19**
B	Replacement of SF_6 RMUs (which are not compatible for Distribution Automation) (Qty-104 Nos.)	**11,25,19,880.28**
C.	Replacement of Oil Filled RMUs by SF_6 RMUs compatible for Distribution Automation) (Qty-95 Nos.)	**9,42,84,409.74**
D.	Replacement of Oil Type switchgears by VCB switchgears compatible for Distribution Automation) (Qty-396 Nos.)	**101,13,55,761.84**
E.	Replacement /Additional of 11 kV HV weak/old cable with 3CX240 SQ Mm XLPE cable (200 KM)	**2683452870.95**
F	Replacement /Additional of 1.1 kV LV weak/old cable with 4CX300 SQ Mm XLPE cable (50 KM)	**906130496.00**
G	PMA Charges	**5,87,51,262.40**
	GRAND TOTAL	**696,80,76,911.40**

Note: 18% GST is included in the cost.

	As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022, BEST was invited and finalised tender to appoint "Project Implementation Agency" with a transparent, competitive, fair and reasonable procedure. Subsequently, ***a copy of a Letter of Award (LoA) has been issued to M/s Rahul cables Ltd. which is enclosed as Annexure-H, Pg. No. 26-36 of 68. For detail cost estimation, kindly refer Annexure-AE.***
2.12	**Least Cost analysis /Alternatives**:

For "Implementation of Renovation /Augmentation of Power /Receiving Substation Works" project under RDSS by appointing 'Implementing Agency' a tender was invited and subsequently, A ***Letter of Award (LoA) has been issued to M/s Rahul cables Ltd. is enclosed as Annexure-H, Pg. No. 26-36 of 68.***

1. As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations,2022 BEST was invited and finalised tender to appoint Agency for Implementation of RSS Project with a transparent, competitive, fair and reasonable procedure.

2. Accordingly, the unit cost is derived from the open tender invited by advertising and following up the procedure mentioned in Apendix-3. The order was placed on the technical suitable and LAO.

3. **Details of offers received for execution of Power /Receiving Substation infrastructure works**:

A per CAPEX Regulation, 2022, Appendix-3, tender for "Distribution Substation related works" were invited; techno-commercial bid and price bid was opened on 08.05.2023 &08.05.2023 respectively. In the tendering process 3 Nos. of bidders have participated. Details of offers received are given in the following table.

Table 67: DSS Tender Comparative Statement

Tr. No.	***Name of the Tenderer***	***Total contractual Value (₹)***	***Ranking***
1	**Rahul Cables Pvt. Ltd.**	**420,65,00,001.32**	**1 (LAO)**
2	KEI Industries Ltd	495,33,73,590.22	2
3	Megha Engineering & Infrastructures Limited	707,08,65,487.84	3

The tender is awarded to the LAO viz. Rahul Cables Pvt. Ltd. with total contractual value of Rs. 420.65 Cr. The offers are excluding R.I. charges towards excavation for cable laying work. ***For detailed as mentioned in the above table, kindly refer Annexure-E, Pg. No.31 of 78.***

2.13	**If not and if Deferred Analysis**: For this case not applicable.
2.14	**Overall Cost-benefit Analysis**: • Due to execution of Capital Schemes, there is saving in distribution losses. • It will improve reliability and quality of power supply. • The scheme will enhance the safety and also reduce supply interruptions and thus will generate additional revenues
2.15	**Methodology of Put to use of the asset and computing Percentage utilization of Project**:

	Following methodology of put to use of the Asset is used. During the Financial Year (April to March), when the capital expenditure made for execution of scheme and when this asset is "PUT TO USE" then only considered for capitalization purpose. Otherwise the said asset will be shown as WIP and IDC will be made applicable on that Scheme.
2.16	**Constraints:** In case of 11kV/1.1kV age old cable replacement job, there is lot of hurdles such as excavation permission from MCGM/MHADA/MMRDA/PWD, etc. Due to scheduled programs on 6th December and 15th January on each year, permission for road/footpath opening is not released by concern authority, resulting delay in execution of the scheme.
2.17	**Inclusion in STU Plan/License for Transmission Projects. Recommendation of the Transmission Planning Committee as provided in the Grid Code:** This is not applicable to this DPR.
2.18	**Works intended for adaptation of latest Technology/Improvement/Up gradation of Existing Infrastructure:** The new technology of SF6 switchgear and RMUs is being extended for the complete system.
2.19	**Upstream/Downstream arrangement:** For this DPR such arrangement is not applicable.
2.20	**Statutory Clearances and Project Layout:** The schemes of replacement of all equipments approved in the DPR are to be executed inside the BEST's DSS. Hence, there is no any land and RoW issue. However, the replacement of 11/1.1kV cables schemes are to be executed in public property, hence for road opening permission from competent authority such as MCGM, MHADA, MMRDA, and PWD is required to be obtained before starting the scheme.
2.21	**Detailed Survey**: For execution of the scheme detail survey is already carried out by project implementing agency.
2.22	**Past Trend and Future projection**: After implementation this scheme, part of balance work is to undertaken in future.
2.23	**Detailed Justification for quantity proposed:** 1. There are around 1021 Nos. of DTs were proposed for replacement under RDSS. However, PFC has approved only 666 Nos. of DTs, hence, same quantity is considered in this DPR. 2. There are around 118 Nos. of Oil Type RMUs were proposed for replacement with SF_6 RMUs under RDSS. However, PFC has approved only 95 Nos. of RMUs, hence, same quantity is considered in this DPR. 3. There are around 562 Nos. of DSS with Oil Type switchgears & they were proposed for replacement with VCB switchgears under RDSS. However, PFC has approved only 396 Nos. of VCB switchgears, hence, same quantity is considered in this DPR. 4. There are around 870 Nos. of DSS were selected for Automation and out of which 104 Nos. of SF_6 RMUs (Non-automable) were proposed for replacement with SF_6 RMUs with Automation features under RDSS. PFC has approved full quantity, hence, same quantity is considered in this DPR.

	5. BEST was proposed to replace 400 KM,11 kV, 3CX240 sq. mm cable which are having maintenance issues. i.e. frequent failure and life of these cables are already completed more than 25 years. However, PFC has approved only 200 km, hence; same quantity is considered in this DPR. 6. BEST was proposed to replace 400 KM, 1.1 kV, 4CX300sq. Mm LV cable which are having maintenance issues. i.e., frequent failure and life of these cables are already completed more than 25 years. However, PFC has approved only 50 km, hence; same quantity is considered in this DPR.
2.24	**Check list of the documents appended:** 1. DPR in the MERC Format for FY2023-24 to FY2025-26 (Pg. No.66-86) 2. Pat-I and Part-II Filled Formats of Capital Investment Scheme for MERC Approval (Pg.No.87-97) 3. Annexure-B:- Guidelines for procurement of materials 4. Annexure-C: - Guidelines of RDSS 5. Annexure-D: - BEST Submission & PFC approval copy 6. Annexure-E: - A copy of Management Approval (BCR) 7. Annexure-H: - A Letter of award of contract M/s Tata P co. Ltd. 8. Annexure-Y: - List of DTs to be replaced 9. Annexure-W _Cost Benefit Analysis for DSS 10. Annexure-AA: - List of SF6 RMUs to be replaced 11. Annexure-AB: - List of OCBs to be replaced 12 Annexure-AC: - List of Oil Type RMUs to be replaced 13 Annexure-AE_ Cost sheet of DSS items 14 Annexure-AF_ DT Losses 15 Annexure-AG_Losses Saving 16 Annexure-AH_ A copy of Specification of DSS items. 17 Annexure AI & Annexure-AJ _Tariff Impact with & without Grant

SCHEMES EXECUTED UNDER RDSS (LOSS REDUCTION)

SECTION 3

AUXILIARY COMPONENTS FOR CONSUMER METERING.

Figure 9: MCB

4.10 SECTION-3

1. Introduction :

For implementation of Prepaid Smart Metering in BEST, a contract work order for replacing 10.80 Lakh conventional/Electronic meters with Prepaid Smart Meters (along with necessary software & hardware)is placed on M/s ATL. There are around 76,667 Nos. of service position in the BEST and more than 10 Lakh meters are installed in the said service positions. Each meter cabin having different size of meter boards and that depends on size and type of meters installed in it. BEST has standardized the sizes of the Meter Boards and are listed in the following table.

Table 68: Description of Existing Meter Boards

Sr. No.	Description of Meter Boards	Size of Board	Nos. of Meters Installed (1 Ph)	Nos. of Meters Installed (3 Ph)
1.	P.U. Paint Coated Marine Plywood Boards for SIMHA 1 Way Board	300 X 200 X 19(12” X 8”)	1	-
2.	P.U. Paint Coated Marine Plywood Service Meter Board	600 X 450 X 19 (24” X 18”)	4	2
3.	P.U. Paint Coated Marine Plywood Service Meter Board	400 X 350 X 19 (16” X 14”)	2	1
4.	P.U. Paint Coated Marine Plywood Service Meter Board	700 X 400 X 19 (28” X 16”)	4	1
5.	P.U. Paint Coated Marine Plywood Service Meter Board	700 X 700 X 19 (28” X 28”)	8	2
6.	P.U. Paint Coated Marine Plywood Service Meter Board	1050 X 400 X 19 (42” X 16”)	6	2
7.	P.U. Paint Coated Marine Plywood Service Meter Board	1050 X 700 X 19 (42” X 28”)	12	4
8.	P.U. Paint Coated Marine Plywood Service Meter Board	1050 X 1050 X 19 (42” X 42”)	18	6

2. Objective and Scope of work:

2.1 Objective:

“To adopt technological advancements in energy metering to achieve Reduction in loss, for accurate measurement of energy, to provide improved service to consumers, Improved billing accuracy, Higher reliability of the system, availability of information and online services, Improved billing and billing accuracy, Outage management and real time data, Work and asset management, to release new supply and to replace existing meters. Also, to harness the capability of AMI / Smart Metering system for the benefit of BEST customers”. For this objective Separate DPR for “Implementation of Pre-paid Smart Metering in BEST” is already submitted to the MERC for in-principle approval of the Hon’ble Commission. This material is required for installation of Smart Meters without which it would not be possible to complete the projects.

2.2 Scope of work:

(i) Refurbishment of Meter Boards (1050 X 1050 X 19 mm i.e. 42" X 42”) with facility to install 15 Nos. of Single Phase Meter, Wire and 63 Amps MCB

(ii) Refurbishment of Meter Boards (1050 X 700 X 19 mm i.e. 42" X 28") with facility to install 4 Nos. of Three Phase Meter, Wire and 100 Amps MC

(iii) Refurbishment of 10 Way Wooden Circuit Boxes for Hutment supply with facility to install 10 Nos. of Single Phase Meter, Wire and 40 Amps MCB.

(iv) Refurbishment of Water Tight Aluminium Meter Box with Cover Type along with supply of and remaking of the cable gland.

(v) Misc work.

3. Technical feasibility report of “Auxiliary Components for consumer Metering (Refurbishment of various Types of Meter Boards for installation of Prepaid Smart Meters with MCB)

A contract for Implementation of Prepaid Smart Metering is awarded to LAO firm i.e. M/s. ATL. As per the Scope of Work about 10,80,676 (1 Phase – 9,01,212 Nos.,) 3 Phase-1,68,419 Nos.,3 Phase HT Meters-206 Nos.,3 Three Phase LT CTO Meters-6053 Nos., DT Meters- 3398 Nos., Feeder Meters- 1255 Nos. and ABT Meters- 133 Nos.) Smart Meters are to be installed in 76,667 + some new added Meter Cabins. ***For a copy of a contract awarded letter to M/s ATL, kindly refer Annexure-AK.***

The Prepaid Smart Meters are to be installed by replacing conventional and Electronic Meters on the existing Meter Boards. The size of conventional meter /Electronic Meters (old) and Smart Meter is almost same, therefore, in such places there is no need to change the meter Boards and wiring. Current purchased Electronic Meters are more compact as compared to old Electronic Meters. Therefore, in some places where compact Electronic Meters are installed, in that place Smart Meters can’t be installed without refurbishing the Meter Cabin. In view of this, for refurbishment of Meter Cabins a contract work Order is issued to LAO firms i.e. M/s. Ramelex and M/s. ASTS. In the Refurbishment work MCB, Broken wires, Clips, and Meter Boards has been considered. The quantity consider for Refurbishing is about 15 % to 20% of the total meters. This is tentative quantity and consider at lower side.

4. **Cost Sheet of the Auxiliary Components Meter Boards**:

Table 69: Cost Sheet of Refurbishing Meter Boards

DETAILS OF BREAK-UP OF TOTAL CONTRACTUAL VALUE OF INDIVIDUAL OFFER COST SHEET OF AUXILIARY COMPONENTS OF THE CONSUMER METERS							
Sr. No.	**Description**	**Unit**	**Qty**	**Basic Rate Material**	**Basic Rate Labour**	**Gross Rate with GST**	**Item wise Total Cos in Rs.**
A	**B**	**C**	**D**	**E**	**F**	**G= 1.18*(E+F)**	**H =D*G**
1.	Refurbishment of Meter Boards (1050 x 1050 X 19 mm i.e. 42"x 42") with facility o install 15 Nos. of Single Phase Meter, Wire and 63 Amps MCB.	Nos.	19190	8093.33	4034.36	14310.66	274621611.46
2.	Refurbishment of Meter Boards (1050 x 700 X 19 mm i.e. 42"x 28") with facility to install 4 Nos. of Three Phase Meter, Wire and 100 Amps MCB.	Nos.	26168	8749.32	3128.03	14015.28	366751849.13
3.	Refurbishment of 10 Way wooden Circuit Boxes for Hutment supply with facility to install 10 Nos. of Single Phase Meter, Wire and 40 Amps MCB.	Nos.	3140	15676.67	2386.80	21314.89	66928769.04
4.	Refurbishment of water Tight Al. Meter Box with Cover Type along with supply of and remaking of the cable gland.	Nos.	26168	2836.33	795.60	4285.68	112147606.20
	Total Cost in Rs.						82,04,49,835.84
5.	PMA Charges –Smart Meters						2,47,00,000.00
6	PMA Charges Aux comp						9517407.95
						Contractual Value	**85,46,67,243.79**

4.1 As per CAPEX Regulation, 2022, Appendix: 3 (Guidelines for Procurement of material), a tender was invited and accordingly, a turnkey contract work order for contractual value of Rs. 82.05 Crore is placed on LAO i.e. on M/s. Ramelex and M/s. ASTS.

5. **Cost Benefit Analysis (CBA):**

Replacement of existing meter boards with refurbished Meter Boards of various sizes with facility of installation of Single / Three Phase Meter, Wire and 40/63/100 Amps MCB would help in installation of Smart Meters in BEST resulting following benefits/objectives:

• By connecting new meters to release new load will increase revenue.	• Improved billing Accuracy.
• Improved Service restoration	• Higher reliability of the system.
• Availability of information and online services.	• Elimination of manual meter reading
• Improved Billing and Billing Accuracy.	• Outage Management and real time data.
• Work and Asset Management.	• Remotely Connect and Dis-connect the meters

Table 70: Phasing of Capital Expenditure:

										Cost in Cr, Rs.
SR. NO.	**PARTICULARS**	**UNIT**	**QTY**	**Total Cost in Cr.**	FY 23-24		FY 24-25		FY 25-26	
					QTY	Cost	QTY	Cost	QTY	Cost
A.	Refurbishment of Meter Boards (1050 x 1050 X 19 mm i.e. 42"x 42") with facility to install 15 Nos. of1 Ph Meter, Wire and 63 Amps MCB.	No.	19190	274621611.5	5757	82386483.44	6716	96110408.68	6717	96124719.34
B.	Refurbishment of Meter Boards (1050 x 700 X 19 mm i.e. 42"x 28") with facility to install 4 Nos. of Three Phase Meter, Wire and 100 Amps MCB.	No.	26168	366751849.1	7850	110019948.63	9159	128365950.3	9159	128365950.3
C.	Refurbishment of 10 Way wooden Circuit Boxes for Hutment supply with facility to install 10 Nos. of1 ph Meter, Wire and 40 Amps MCB.	No.	3140	66928769.04	942	20078630.71	1099	23425069.17	1099	23425069.17
D.	Refurbishment of watre Tight Aluminium Meter Box with Cover Type along with supply of and remaking of the cable gland.	No.	26168	112147606.2	7850	33642567.59	9159	39252519.31	9159	39252519.31
E	PMA Charges for Auxiliary component	-	-	9517407.95		2855137.47		3331052.24		3331218.24
F	PMA charges for Smart meters	-	-	2,47,00,000.00		7409779.62		86,44,894.78		86,45,325.60
	GRAND TOTAL		**-**	**85,46,67,243.79**	-	**25,63,92,547.45**	**-**	**29,91,29,894.42**	**-**	**29,91,44,801.92**

6. Phasing of Capital expenditure and Capitalization of Meter Boards

Table 71: Phasing of Capital expenditure and Capitalization of Meter Boards

Particulars	**Total**	**Phasing of Capital Expenditure**		
		2023-24	**2024-25**	**2025-26**
Total CAPEX with PMA	85.47	25.64	29.91	29.92
Total Capitalization with PMA	85.47	25.64	29.91	29.92
PFC Approved CAPEX	72.53	21.76	25.38	25.39
PFC Approved Capitalization	72.53	21.76	25.38	25.39
Approved PMA Charges-Smart Meters	2.47	0.74	0.86	0.87
Approved PMA Charges-Auxiliary component	1.09	0.32	0.38	0.39
60% Grant on PMA Charges (combined)	2.13	0.63	0.74	0.76
60% Grant on CAPEX	43.52	13.06	15.23	15.23
Total Grant with PMA (combined)	**45.65**	**13.69**	**15.97**	**15.99**

APPENDIX-3:

1. Part1:

Part-I: Particulars of Auxiliary Component required for installation of Smart Meters furnished in the over view of the DPR

1.1.	**Name of Applicant**: BEST (Brihanmumbai Electric Supply & Transport Undertaking)
1.2.	**Name of the Capital Investment Work**: Auxiliary Component for Consumer Metering (Meter Boards, Single Pole MCB, Cu cable etc) for implementation of Smart Metering Project.
1.3.	**Nature of CAPEX Scheme (Revised:** Revised Capex Scheme
1.4.	**Details of the Location**: Mumbai circle (BEST's Licensee Area) Head quarter Coordination lat 18.9216780548024, long 72.8300250353453
1.6	**Date of Approval by Competent Authority designated by the Board of Directors of the Company**: *A copy of management approval for RDSS Scheme including "Implementation of Infrastructure works under Loss Reduction" is enclosed as* ***Annexure-E.***
1.7.	**Category of DPR**: MERC (Approval of Capital Investment Schemes) Regulations, 2022 . **Regulation Clause 3, Sub Clause 3.1** (a) New Infrastructure to meet upcoming load; (l) Fulfilment of any statutory compliance requirement (Smart Metering); **Regulation Clause 3, Sub Clause 3.9** (a) Infrastructure required for releasing new supply connections; (e) Capital Nature Schemes funded partially by Central or State Government Grants (RDSS); (n) All metering schemes; (o) Improvement in consumer services;
1.8.	Objective of the Capital Investment: The basic objective of the scheme is to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25. (BEST had already achieved this target. BEST's Distribution loss is less than 5%). Further, objective is to reduce ACS- ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMS and for improvement in the quality, reliability and affordability of power supply to the consumers through a financially sustainable and operationally efficient Distribution Sector. 24x7 power supply for consumers in Mumbai City. Reduction of AT&C losses/maintaining of existing low level of AT&C losses To maintain reliability and quality of Electric Supply to the Consumers. Renovation/Refurbishment of Meter Boards in the 240/415V Service Position housing the LV Meters of the Undertaking to accommodate Smart Meters which are of different size then old meters.
1.9	**Need of Analysis**: GoI has launched RDSS to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25. To meet this objective GoI has approved the scheme for 'Implementation of Pre-Paid Smart Metering'. Accordingly, to accommodate the bigger size smart meters replacement of some of the meter boards, MCB, wires etc is necessary.
1.10	**List of Identical schemes previously approved by the Commission and their progress report (5 years data):** First time BEST is implementing the Schemes for Loss Reduction under RDSS. Hence, no previous records of such schemes.

1.11.	**State Map showing Location of the Scheme (for Transmission)**- Not Applicable
1.12.	**Brief scope and specification of work**: The B.E.S & T Undertaking will be carrying out work of replacement of existing energy meters by smart meters for its consumers for giving them enhanced service and for achieving system loss reduction. While installing the meters at the service positions, work involved will be replacement/ installation of New Meter Board, wiring or rectifying defective/deteriorated wires, MCBs, etc. Hence, this Rate Contract on turnkey basis for Refurbishment of Meter Boards in the 240/415 V Service Position housing the LV meters of the Undertaking (Material and Labour), has been initiated as Auxiliary component for the Consumer SMART Metering Project. ***For copy of Specifications of above items, kindly refer Annexure-AM, Pg. No. 4421-4533.***
1.13.	**Any Reference of Study Report / recommendation of OEM/Expert:** N.A for this DPR.
1.14.	**Estimated Cost**: This cost also includes PMA cost of Smart Meters as well as Auxiliary component. Rs.85.47 Cr. (FY 2023-24–25.64 Cr., FY 2024-25–29.91 Cr. and FY 2025-26-29.92 Cr.) IDC is not included in the costing. ***A copy of Cost Sheet enclosed as Annexure-AN, Pg. No. 4534-4539.***
1.15.	**Time Frame of the expenditure:** Project completion Period 36 months. Table 72: Time Frame of Capex

Financial Year	Capex Expenditure (in Rs.)	Capitalisation (in Rs.)
2023-24	25,63,92,547.45	25,63,92,547.45
2024-25	29,91,29,894.42	29,91,29,894.42
2025-26	29,91,29,894.42	29,91,29,894.42
TOTAL	**85,46,67,243.79**	**85,46,67,243.79**

1.16. Funding arrangement: For FY2023-24toFY 2031-32 (for 9 years from the date of contract).

Table 73: Funding arrangement

Sources of Funds	Amount (in Crs.)	Share (%)
Debt (90% of balance cost)	35.84	42
Equity (10% of balance cost)	3.98	5
Grant (60% of approved cost)+PMA	**45.65**	53
Consumer Contribution/Deposit Works	-	-
Total	**85.47**	**100**

Please kindly note that PFC approved cost for Auxiliary component including PMA Charges is Rs. 85.49 Cr. and Grand of Rs. 45.59 Cr. Shall be made available from GoI for this project which is 60% of approved cost. ***For total Grant amount, kindly refer Table no.70, Pg. No.102.***

1.17 Benefits/Impact:

- There is saving in distribution losses. Improved billing Accuracy.
- It will generate additional revenues.
- It will improve reliability and quality of power supply.

Impact on tariff by considering 60% Grant and without Grant is given below:

Table 74: Impact on Tariff with & without GBS (Grant)

F .Y.	23-24	24-25	25-26	26-27	27-28	28-29
With Grant	0.0024	0.0071	0.0119	0.0139	0.0133	0.0127
Without Grant	0.0051	0.0152	0.0256	0.0298	0.0285	0.0273

Tariff impact with Grant and without Grant is worked out and same is shown in the above table. ***For Tariff Impact with & without Grand, kindly refer Annexure-AL& Annexure-AM respectively.***

1.18. Overall Cost-benefit Analysis: Improved billing accuracy, Elimination of manual meter reading, Consumer satisfaction etc by implementation of Smart Pre-paid Metering.

2. PART-II: Particulars of Auxiliary components required for installation of Smart Meters furnished for justification of works

2.1	**Need of the investment**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' are to achieve an efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like high AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas being concentrated by the government for the development of country. The government has taken initiatives for (i) complete revamping of power sectors electrical equipment across the country and (ii) for the need of changing the way of operation and control of the electrical equipment. Accordingly,, Govt. of India has launchedthe Revamped Distribution Sector Scheme (RDSS) to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. The Scheme would be available till the year 2025-26. REC and PFC have been nominated as nodal agencies for facilitating implementation of the Scheme. Accordingly, Power Ministry of Govt. of India has issued guidelines for implementation of RDSS The B.E.S & T Undertaking will be carrying out the work of replacement of existing energy meters by Smart meters for its consumers for giving them enhanced service and for achieving system loss reduction. The size of Smart meter is bigger than the normal electronic meter. While installing the Smart meters at the service positions, work involved will be replacement/ installation of New Meter Board to accommodate the bigger meter, wiring or rectifying defective/deteriorated wires, MCBs, etc. Hence out of 10.48 Lakh meters plus new meters, we expect replacement/new meter board for 5.23 Lakh meter including minor works. Hence, this Rate Contract on turnkey basis for Refurbishment of

	Meter Boards in the 240/415 V Service Position housing the LV meters of the Undertaking (Material and Labour), has been initiated as Auxiliary component for the Consumer SMART Metering Project. **Objective of the scheme:** There is addition of new consumers due to development of Coastal Road, Mill and SRA Schemes, EV Charging, Sewree bridge, Redevelopment of Plots etc. In order to meet the requirement of new Consumers for releasing new Load, Smart Meters are required installed. • 24x7 power supply for consumers in Mumbai City • Reduction of AT&C losses/maintaining of existing low level of AT&C losses • To maintain reliability and quality of Electric Supply to the Consumers
2.2	**Time lines of the Project:** 1. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.1), project approval date was 31.03.2023. As per guidelines BEST had prepared Action Plan and DPR for FY 2023-24, FY2024-25 & FY2025-26 by considering the audited annual accounts for FY 2019-20 & FY2020-21 and submitted to the Executive Director (IPDS), PFC on 22.08.2022. 2. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.2), the last date for completion of this scheme will be 31.03.2026. The works executed beyond this time lime will not be eligible for getting grant of GoI.***For timeline, kindly refer Annexure-C, Pg. No.16-17 of 56.*** 3. There is Urgency of the capital investment as the implementation of the work is to be done in parallel to the Smart Meter work. It cannot be deferred as without it we will not be able to complete the Smart Metering project. 4.
2.3	**Scheme for revised approval/scope/cost**: New Capex Scheme under RDSS.
2.4	**Proposed Capital Investment Scheme**: Auxiliary Component for Consumer Metering (Meter Boards, Single Pole MCB, Cu cable etc replacement) for implementation of Smart Metering Project.
2.5	**Technical Justification**: 1. Govt. of India has launchedthe RDSS to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by

	2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. 2. **MYT Regulation:** As per Clause No. 74.1 of MYT Regulation 2019, BEST has submitted DPR for strengthening and augmentation of its distribution network meeting the requirement of load growth, reduction in distribution losses, improvement in quality of supply, reliability, reduction in congestion, etc. 3. The size of Smart meter is bigger than normal meter. While installing the Smart meters at the service positions, work involved will be replacement/ installation of New Meter Board to accommodate the bigger meter, wiring or rectifying defective/deteriorated wires, MCBs, etc. 4. The Achievement will be completion of the target of Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality Regulations, 2021 that states that all the existing meters whenever replaced shall be replaced only by Smart Meter or Meter having at least the facility of remote reading **5. Regulation Clause 3, Sub Clause 3.1** (a) New Infrastructure to meet upcoming load; (l) Fulfilment of any statutory compliance requirement (Smart Metering); **6. Regulation Clause 3, Sub Clause 3.9** (a) Infrastructure required for releasing new supply connections; (e) Capital Nature Schemes funded partially by Central or State Government Grants (RDSS); (n) All metering schemes; (o) Improvement in consumer services;
2.6	**Financial Justification:** 1. As per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilize internal funds for executing all its Capital Expenditure plans. But due to financial crunch for in house schemed BEST has decided to utilize 30% equity from internal sources and balance debt portion of 70% will be borrowed from financial institutions such as REC, PFC, Banks, etc. 2. In RDSS Project, for infrastructure works, GoI has sanctioned 60% Grant against sanctioned DPR Cost. For the works, GoI has approved Rs.45.59 Cr Grant (including PMA cost) as against approved project cost of Rs. 72.53 Cr.

3. For execution of Auxiliary Component (Smart Metering) project actual cost arrived by tendering process is Rs. 85.47 Cr (including PMA cost). Out of which Rs.45.59 Cr will be the grant amount and balance Rs. 39.88 Cr will be the amount which will be borne by BEST. Out of Rs.39.88 Cr, equity amount will be 10% i.e. Rs. 3.99 Cr. and balance 90% amount of Rs. 35.89 Cr. Will be made through debt.
4. BEST has applied to REC for loan amount for execution of RDSS.

2.7 **Consent of M-DNAC**: As per Electricity Act, 2003, Clause, 42(3), BEST undertaking being a local authority, hence exempted from open Access.

2.8 **Plan of other Transmission Licensees / CTU**: DPR is related to Distribution Licensees, hence Not Applicable.

2.9 **Phasing of Investment** :

Table 75: Phasing of Capital Investment

FY	Capex Expenditure (in ₹ Cr)	Capitalisation (in ₹ Cr)
2023-24	25.64	25.64
2024-25	29.91	29.91
2025-26	29.92	29.92
TOTAL	**85.47**	**85.47**

2.10 **Statutory/Safety Requirement: N.A**

2.11 **Cost Assessment /Cost Break-up**:

Table 76: Cost Break-up

SR. NO.	PARTICULARS	Total Cost in ₹
A.	Refurbishment of Meter Boards (1050 X 1050 X 19 mm i.e. 42"X 42") with facility to install 15 Nos. of Single Phase Meter, Wire and 63 Amps MCB.	27,46,21,611.46
B.	Refurbishment of Meter Boards (1050 X 700 X 19 mm i.e. 42"X 28") with facility to install 4 Nos. of Three Phase Meter, Wire and 100 Amps MCB.	36,67,51,849.13
C.	Refurbishment of 10 Way wooden Circuit Boxes for Hutment supply with facility to install 10 Nos. of Single Phase Meter, Wire and 40 Amps MCB.	6,69,28,769.04
D.	Refurbishment of water Tight Aluminium Meter Box with Cover Type along with supply of and remaking of the cable gland.	11,21,47,606.20
E	PMA Charges of Auxiliary components	9517407.95
F	PMA Charges of Smart Meters	2,47,00,000.00
	GRAND TOTAL	**85,46,67,243.79**

Note: 18% GST is included in the cost.

	As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022, BEST was invited and finalised tender to appoint "Project Implementation Agency" with a transparent, competitive, fair and reasonable procedure. ***Subsequently, Letter of Award (LoA) has been issued to M/s ASTS Smart Infrastructure Private Limited and M/s RAMELEX Pvt. Ltd. For cost estimation, kindly refer Annexure-AN.***
2.12	**Least Cost analysis /Alternatives**: 1. ***Letter of Award (LoA) regarding the*** Proposal of "Rate Contract on turnkey basis for Refurbishment of Meter Boards in the 240/415V Service Positions housing the LV Meters of the Undertaking" i.e. Auxiliary Component for Consumer metering *has been issued to*M/s ASTS Smart Infrastructure Private Limited and M/s RAMELEX Pvt. Ltd. 2. As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022 BEST has invited and finalized the tender with a transparent, competitive, fair and reasonable procedure. 3. Accordingly, the unit cost is derived from the open tender invited by advertising and following up the procure mentioned in Apendix-3. The order was placed on the technical suitable and LAO. 4. A tender was opened through open bidding process on Maha e-tender Portal. BEST undertaking advertised the tender in the local as well as all over India media. Initially, Notice of Inviting Tender was advertised for "Rate Contract on turnkey basis for Refurbishment of Meter Boards in the 240/415V Service Position housing the LV Meters of the Undertaking (Material and Labour)". 5. **Details of offers received**: As per CAPEX Regulation, 2022, Appendix-3, tender for "Auxiliary component for consumer metering", techno-commercial bid opened on 24.04.2023 and price bid opened on 02.05.2023 in which 4 Nos. of bidders were quoted for said work. Details of offers received are given in the following table.

	Table 77: Meter Board Tender Comparative Statement

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking
1	ASTS Smart Infrastructure Pvt. Ltd.	82,04,49,771.50	1 (LAO)
2	Ramelex Private Limited	84,94,90,356.74 # (Revised Offer) (82,04,48,763.16)	2
3	JBS Enterprises Pvt. Ltd.	1,35,80,52,806.60	4
4	SAP Control Systems and Engineers Pvt. Ltd.	1,02,07,93,423.62 # (Revised Offer) (82,04,49,771.50)	3

Tenderer No. 2 & 4 has matched their rates (#) with LAO. Hence, by considering quoted price difference, as per tender guidelines, tender quantity is divided between ASTS Smart Infrastructure Pvt. (60%) Ltd. and Ramelex Private Limited (40%). ***For details of above, kindly refer Annexure-E, Pg. No. 71 & 72 of 78.***

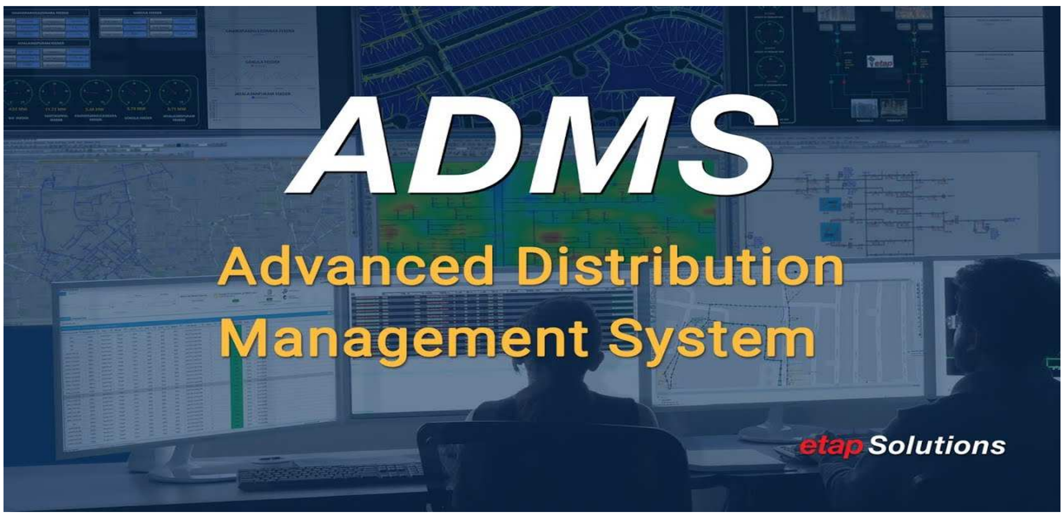
2.13	**If not and if Deferred Analysis**: For this case, N. A. as it is to be done to accommodate the Smart Meters for which order has been placed.
2.14	**Overall Cost-benefit Analysis**: Improved billing accuracy, Elimination of manual meter reading, Consumer satisfaction etc by implementation of Smart Pre-paid Metering.
2.15	**Methodology of Put to use of the asset and computing Percentage utilization of Project**: During the Financial Year (April to March), when the capital Expenditure made on execution of particular scheme and when this asset is "PUT TO USE" then only considered for capitalization purpose. Otherwise the said asset will be shown as WIP and IDC will be made applicable to this Scheme.
2.16	**Constraints:** There would be cases where the board with large size Smart meter would not fit in the service meter cabin. In such case the cabin would be required to be extended and will take some time.
2.17	**Inclusion in STU Plan/License for Transmission Projects. Recommendation of the Transmission Planning Committee as provided in the Grid Code:** Not Applicable
2.18	**Works intended for adaptation of latest Technology/Improvement/Up gradation of Existing Infrastructure: N.A.**
2.19	**Upstream/Downstream arrangement:** For this DPR such arrangement is not applicable.

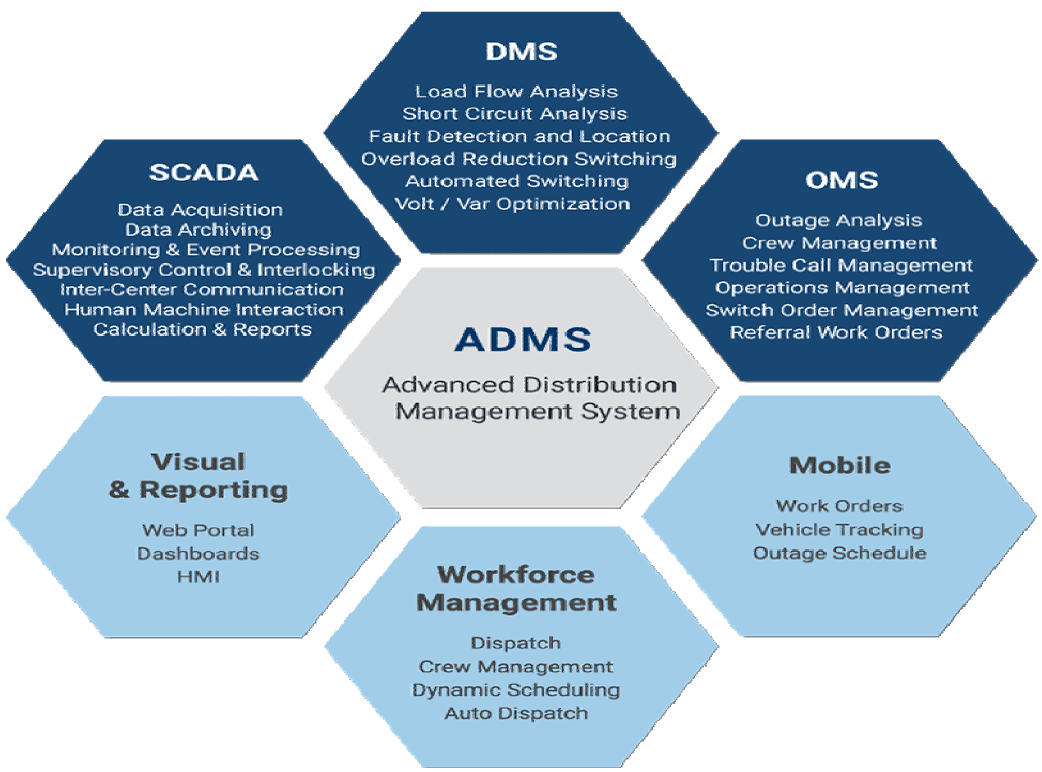
2.20	**Statutory Clearances and Project Layout: S**ince, Meter Boards and accessories are to be installed in the meter cabins which are constructed by the developer while constructing the building and in the existing meter cabins, there is no need of statutory clearances required from any other authority for this project.
2.21	**Detailed Survey**: For execution of the scheme detail survey is already carried out by project implementing agency.
2.22	**Past Trend and Future projection**: Not Applicable
2.23	**Detailed Justification for quantity proposed:** BEST was proposed Auxiliary components (Meter Boards, Single Pole MCB, Cu cable, etc replacement) for 8,01,374 Nos. of meters under RDSS, however, PFC has approved only the quantity of meter boards for accommodating 5,23,357 Nos. of meters. Hence, the proposed quantity is tendered accordingly (Meter Boards & Auxiliary works).
2.24	**Check list of the documents appended:** 1. DPR in the MERC Format for FY2023-24 to FY2025-26 (Pg. No.98-102) 2. Pat-I and Part-II Filled Formats of Capital Investment Scheme for MERC Approval (Pg.No.103-112) 3. Annexure-B:- Guidelines for procurement of materials 4. Annexure-C: - Guidelines of RDSS 5. Annexure-D: - BEST Submission & PFC approval copy 6. Annexure-E: - A copy of Management Approval (BCR) 7. Annexure-H: -LoA of contract to M/s ASTS Smart Infra. Pvt. Ltd. 8. Annexure-AN: - Detail cost sheet 9. Annexure - AO:-Specification of Auxiliary Components

SCHEMES EXECUTED UNDER RDSS (LOSS REDUCTION)

SECTION-4

IMPLEMENTATION OF ADVANCED DISTRIBUTION MANAGEMENT SYSTEM (ADMS)





4.11 SECTION-4

1. BACKGROUND OF SCADA SYSTEM:

SCADA is an acronym that stands for Supervisory Control and Data Acquisition. SCADA refers to a system that collects data from various sensors at a factory, plant or in other remote locations (such as RSS, DSS) and then sends this data to a central computer which then manages and controls the data. SCADA System includes Hardware and Software components. The hardware gathers and feeds data into field controller System, which forward data to other Systems that process and present it to a Human-Machine Interface (HMI) in a timely manner. SCADA Systems also record and log all events for reporting process status and issues. SCADA Applications warn when conditions become hazardous by sounding alarms. Typical digital signals to monitor and control are level switches, Pressure switches, generator status, relay & motors etc.

1.1 SCADA Functions:

- Remote control of Receiving Substation switchgears
- Monitoring status of switchgears, station equipments
- Control & indication of the tap position of On Load Tap Change gear (OLTC) of T/F
- Real-time acquisition & storage of telemetering data of T/FS and feeders in the RSS
- Logging of time-stamped sequential events/alarms
- Trending of telemeter data
- Generation of user configurable Reports

1.1.1 **Application of SCADA System**:

- Control & Monitoring of RSS equipments from Remote control centers
- Quicker restoration of Electric supply
- HV Voltage Regulation
- Network planning based on Stored historical data
- Outage Management
- Tool for Fault analysis & Preventive maintenance
- Option to integrate with third party IT related applications such as Load forecasting, IVRS, GIS, etc.

2. HISTORY OF SCADA:

2.1 Earlier BEST introduced Electro-Mechanical Relay based in the year around 1970. The brief history of SCADA is mentioned below:

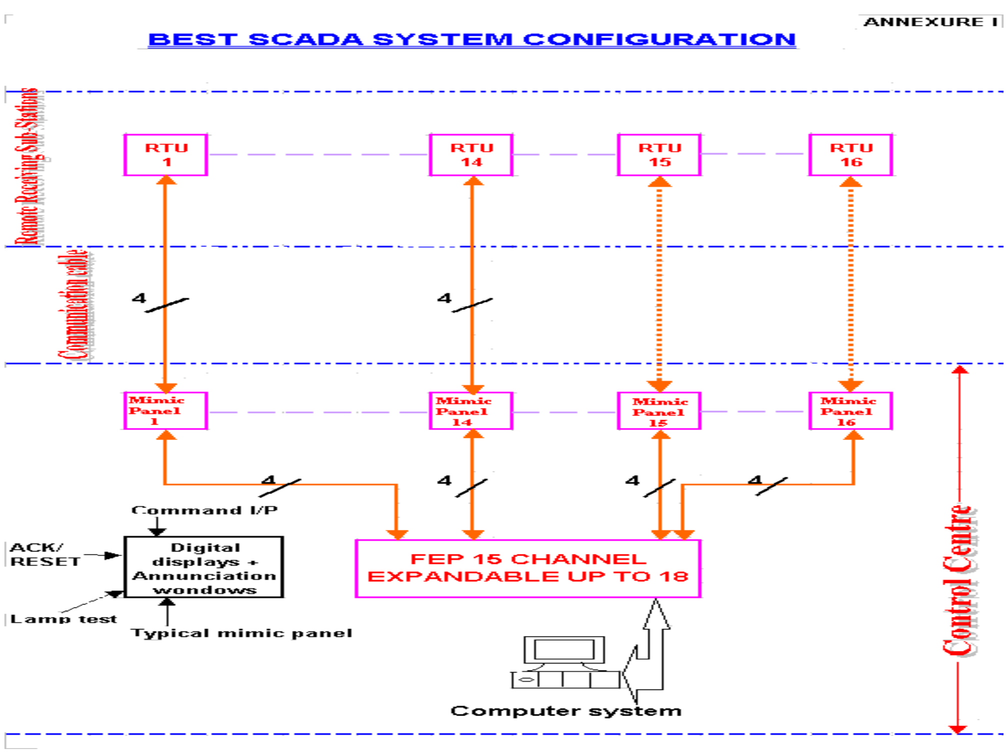
- **1970:** BEST introduced ITI make Electro-Mechanical operated relay based Supervisory Remote control (SRC) System, using BEST's dedicated communication cable network for 20 RSS. This was the probably first Automation system introduced in the distribution sector in India.

- **1989-1995:** BSET introduced Meltron / SITU Make Microprocessor based SCADA System, using BEST's dedicated communication cable network for 16 RSSs in North and Central North Zone. The system has already been scrapped.

- **2003-2004:** BEST introduced NELCO,SITU Make Intelligent Electronic Devices(IED) based SCADA System using TDMA Microwave communication. It was commissioned in 22 RSS in South Zone and Central South Zone. The system has already been scrapped.

- **2009**-2014: BEST had introduced IEC 61850 – Ed I compliant Numerical Relay based SCADA System in North & Central North Zone for 23 RSS. The project also included revamping/commissioning of 3 Zonal Control Center and ULMC (Unified Load Monitoring Centre). Now, the system is partially operational. The communication media is MTNLs dedicated Point to Point Lease Lines.

2.2 Architecture of Microprocessor based SCADA System in North & Central North Zone:



2.2.1 Configuration of Microprocessor based SCADA system

- Remote Terminal Equipments (RTU) at RSS
- Mimic panels at Master Control
- Central Computer system located at Zonal Control centre
- Front End Processors at Zonal control centre
- Landline communication system

2.2.2 Limitations of Existing Microprocessor based SCADA system

(i) Monitoring of voltage and current for only one phase through Mimic Panels

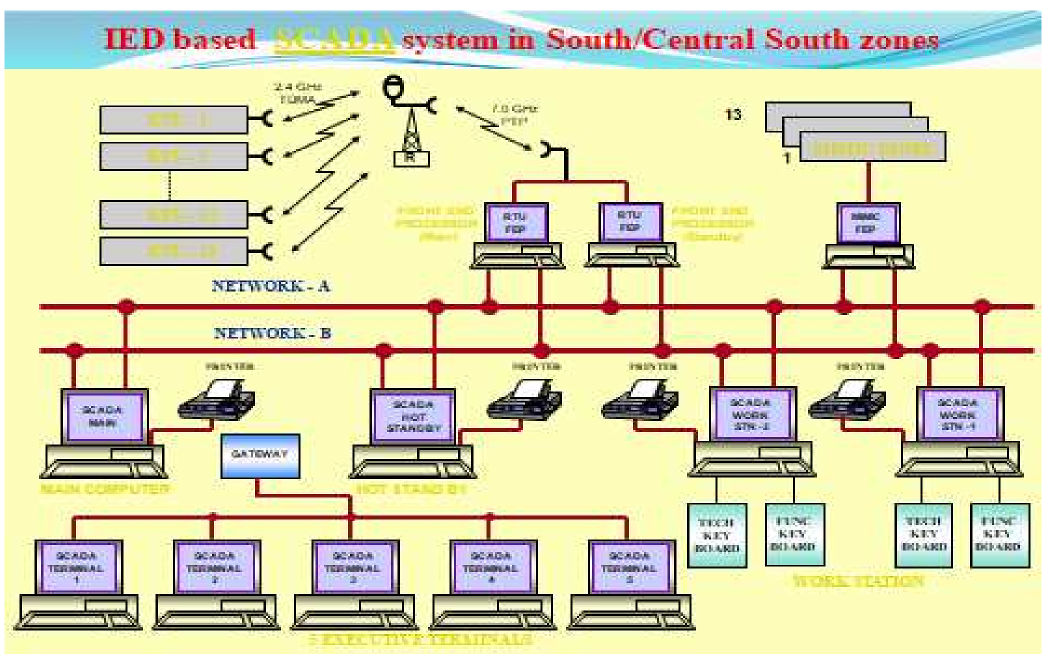
(ii) Computer system at Zonal control centre is scrapped resulting control, monitoring & data storage facility through PC not available

(iii) No Local SCADA at RSS level

(iv) Loss of communication links caused by repeated failure of BEST's communication cables due to ageing/faults

(v) Maintenance problem as spare parts are not available in the market

2.3 IED base SCADA System in South / Central South Zone:



2.3.1 Configuration of IED based SCADA system:

❖ **Master Control level equipments**

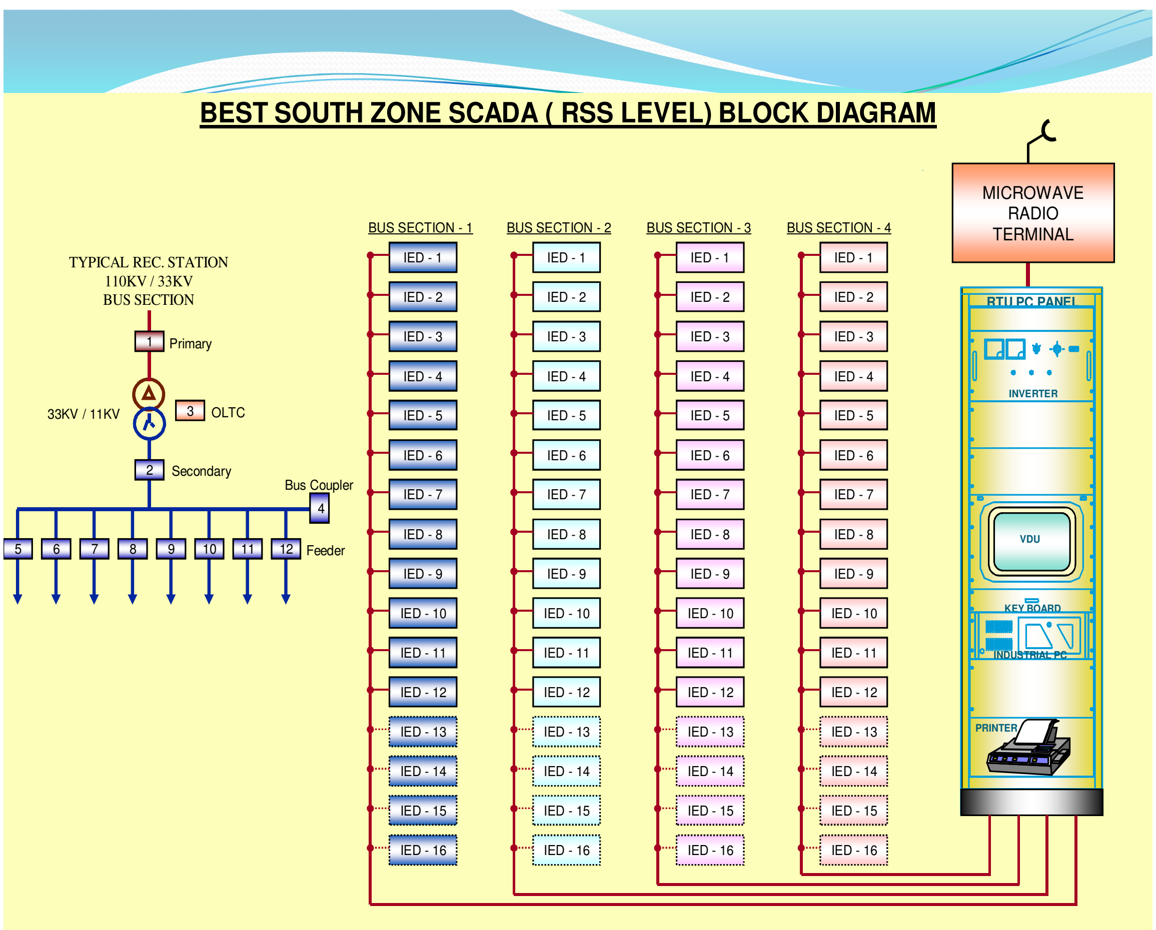
- UNIX OS based Computer system in hot standby mode
- Dual redundant communication server
- Dual LAN
- Mosaic type mimic panels

- ➢ Two workstations on dual LAN
- ❖ **Receiving Substation level equipments**
- ➢ Industrial grade PC as RTU with local control facility
- ➢ Individual IEDs for control, measurement & monitoring of each equipment connected in RS-485 multi-drop mode with close loop

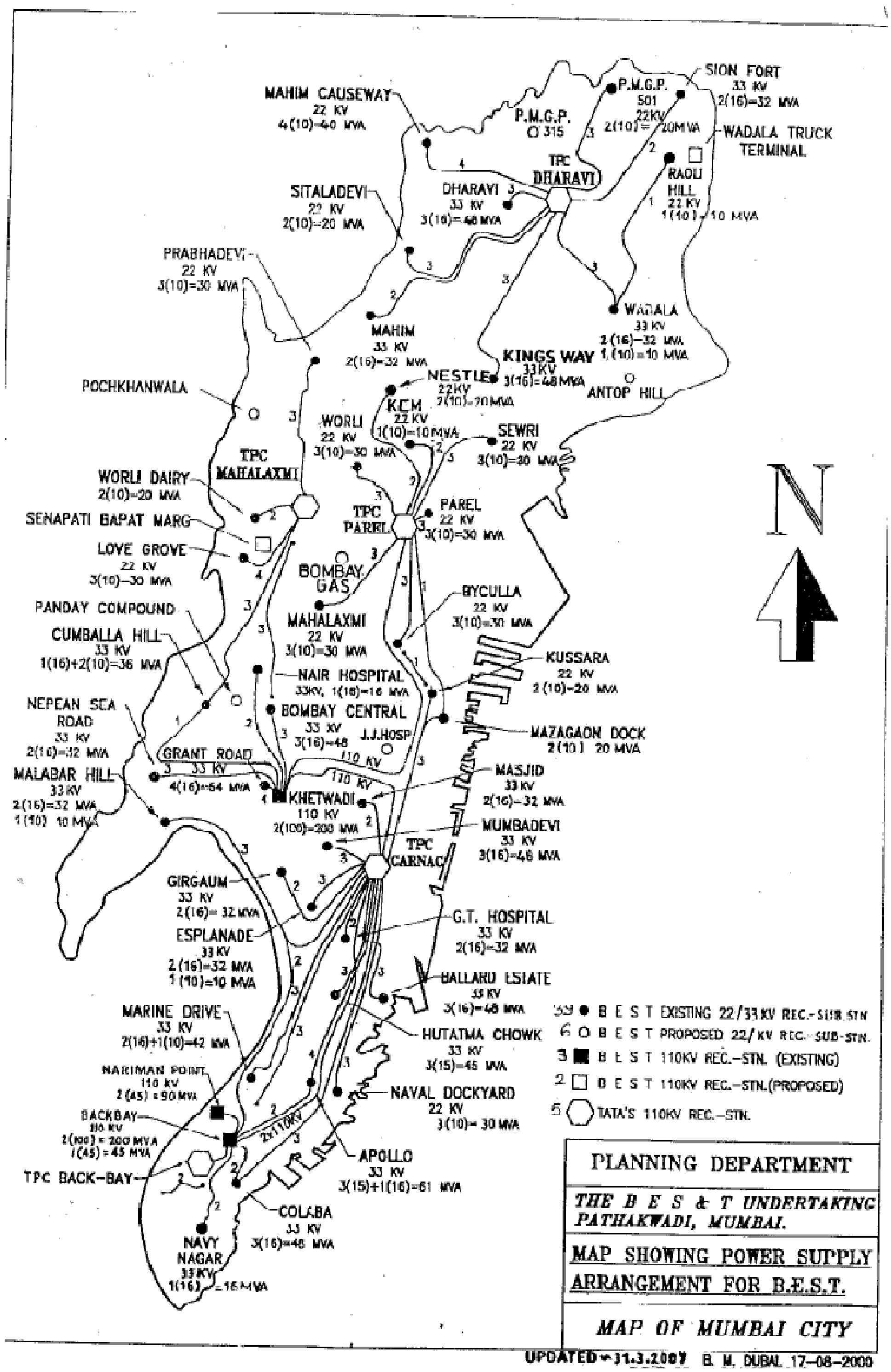
2.3.2 Features of IED based SCADA system:

- Open system architecture with DNP 3.0 protocol
- Distributed architecture
- GPS for time synchronisation
- Waveform disturbance recording and Harmonic Analysis
- 3 Phase current & voltage measurement with derived electrical parameters
- Executive terminals
- Multilevel password
- Security tagging in case ofshutdowns
- Communication in TDMA Microwave mode

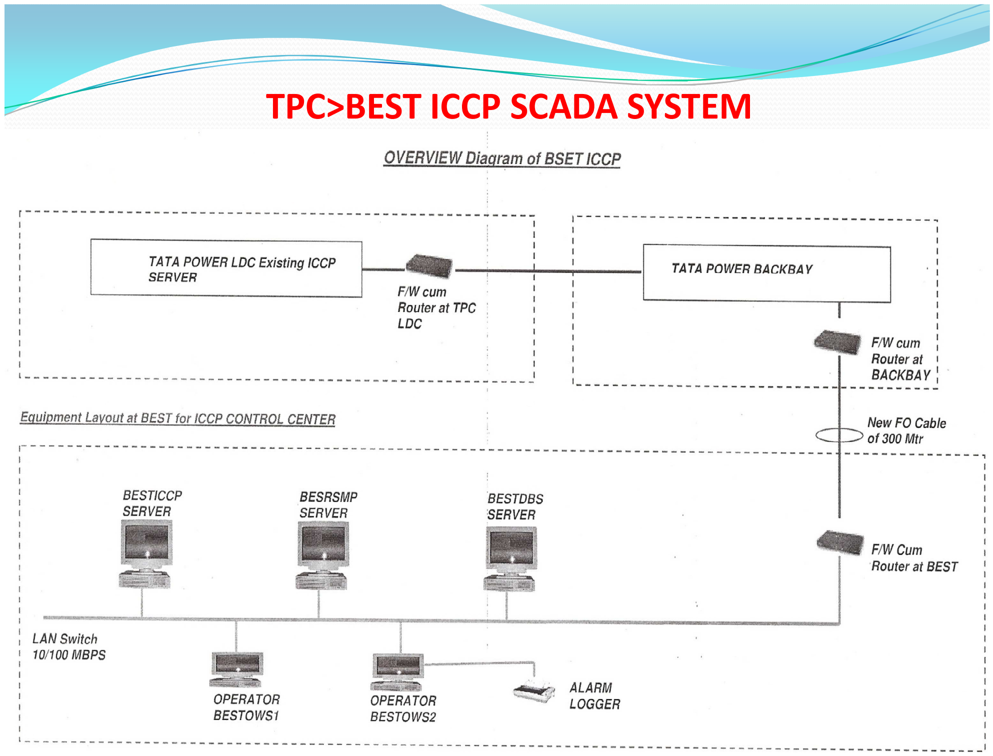
3.3.3 SCADA RSS LEVEL BLOCK DIAGRAM (SOUTH ZONE):



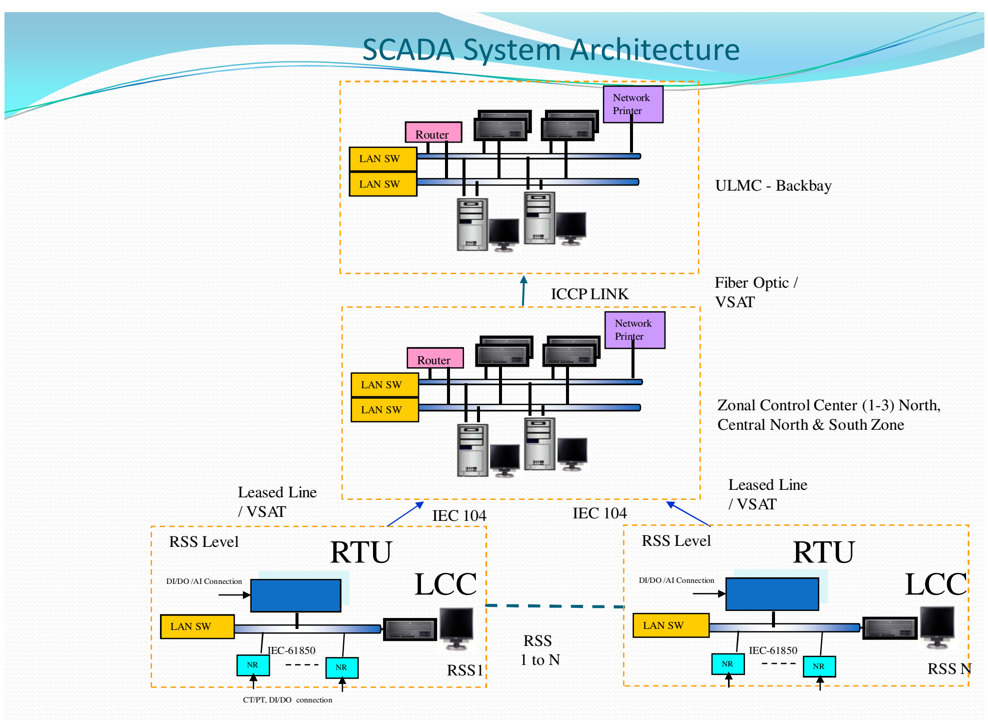
2.3.4 IED BASED SCADA SITE LOCATIONS



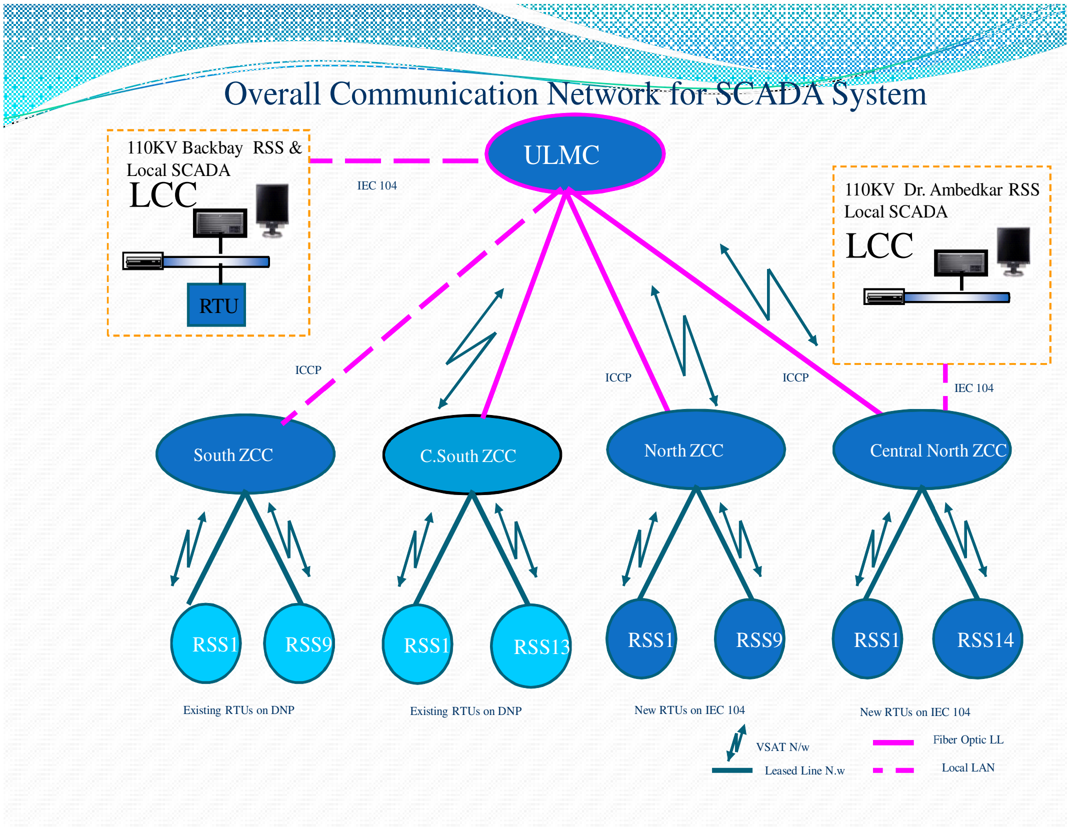
2.4 TPC › BEST ICCP SCADA SYSTEM: BEST also had installed ICCP based SCADA system as a requirement of ABT in year 2007. BEST end Architecture is shown below. This system is discontinued due to aging & technical obsolesce of equipments.



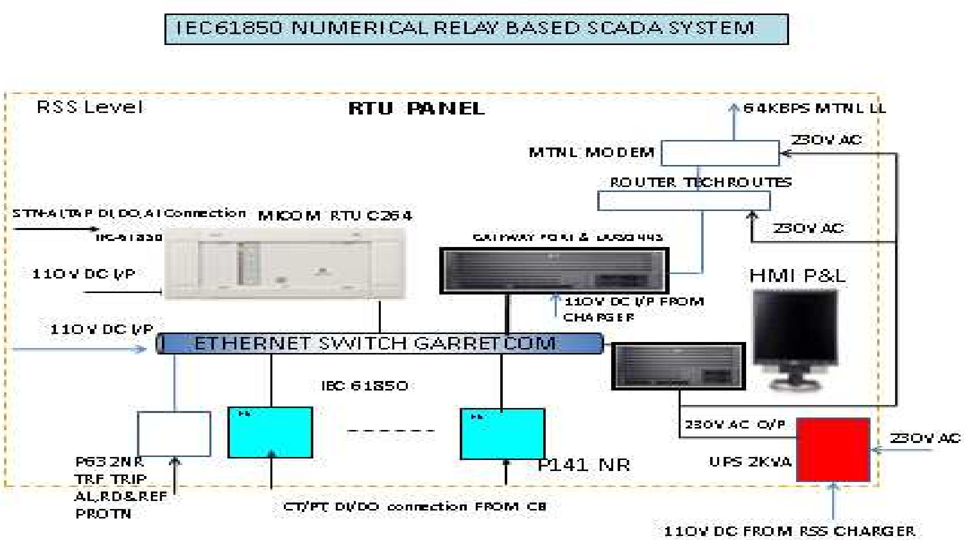
2.5 IEC 61850 BASED SCADA SYSTEM ARCHITECTURE:



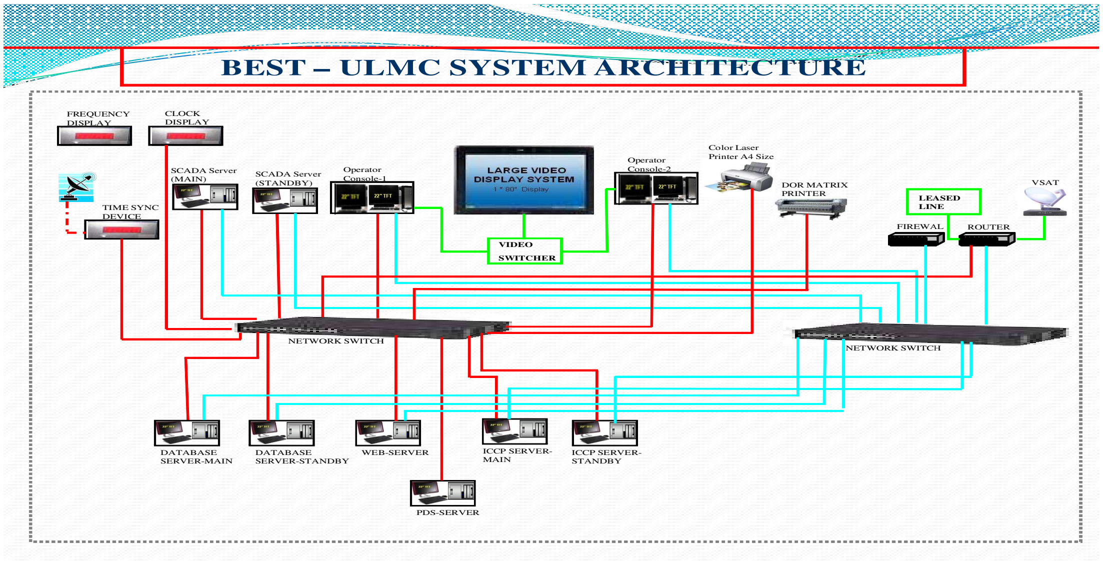
2.5.1 OVERALL COMMUNICATION NETWORK ARRANGEMENT FOR SCADA:



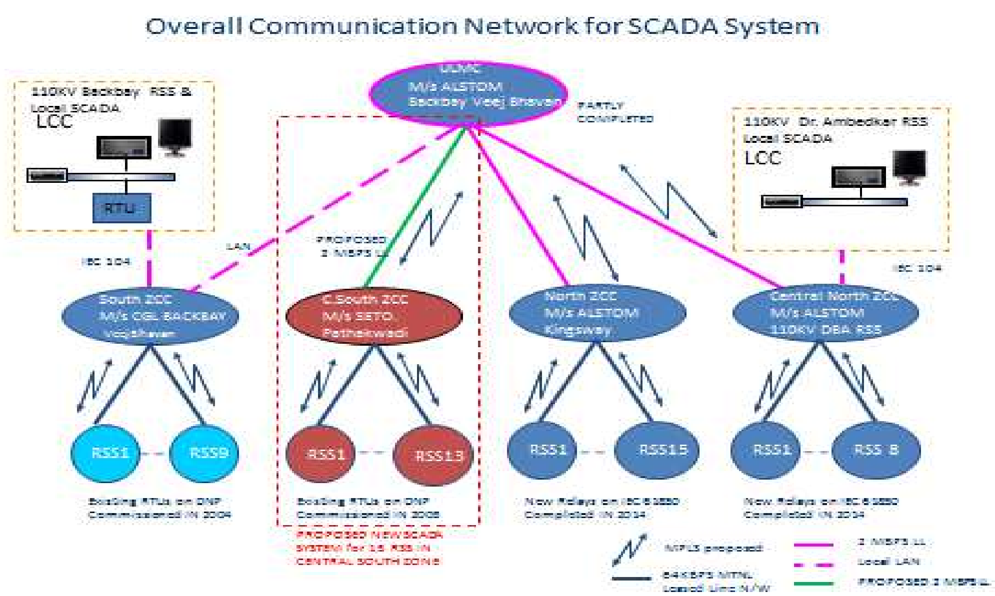
2.5.2 RSS level Architecture of IEC 61850 basedSCADA system



2.6 BEST ULMC SYSTEM ARCHITECTURE:



2.7 Connectivity diagram of 4 ZCCs and details of RSS in respective zones



2.8 STATUS OF RELAY BASED SCADA SYSTEM:

For the operational purpose, the BEST's area is divided in 5 zones viz. North East (NE), North West (NW), Central North (CN), Central South (CS) & South (S). Out of these RSS of NE, NW & CN are having Relay Based SCADA System catering to 23 RSS. It was commissioned in the year 2014.

2.9 System Architecture:

The SCADA system at the Receiving Substations in North zone is supplied by M/s Alstom Ltd. The SCADA system is having distributed architecture. Numerical relays for bay level data acquisition, protection & control are installed on individual 33kv, 11 KV switchgears. Separate Numerical relays are provided for Transformer primary & secondary switchgears, Bus-coupler and OLTC Tap change control/indication on switchgear itself. All these devices are connected to Remote Terminal Unit (RTU), Gateway in FO network. RTU is mainly used to collect Analog data, Station alarms, Digital Inputs of respective RSS.

The Gateway communicates with their respective Zonal Control Center& Local HMI using MTNL Leased line connectivity, LAN. The Communication between RSS SCADA Systems and ZCC SCADA systems is through IEC-104 protocol

The Local SCADA system (HMI PC & Gateway) is supplied by M/s Alstom Ltd. works on Windows-XP, e-terra Control 3.4 SCADA software. The above SCADA systems communicate on IEC-61850 Ed –I protocol to bay level Numerical Relays.

The ZCC system is supplied by M/s Alstom Ltd (now M/s GE). At Zonal Control Centres, system consists of SCADA servers, FEP server & WEB cum ICCP server. The servers are redundant and are in hot-standby mode. Apart from these servers, two workstations connected as Human Machine Interface (HMI) operate on dual LAN connectivity.

Now it is proposed to replace the existing SCADA systems of 49 RSS in all zones.

3. Objectives and Scope of Work of ADMS:

3.1 Objectivise:

(i) Replacement/Augmentation of Existing SCADA, Implementation of Distribution Management System (DMS), Outage Management System(OMS), Field Force Automation (FFA), Communication for ADMS, Integration of ADMS with other Automation System such as AMI, ERP, GIS, Call Center, etc.

(ii) Prompt restoration of Electric Supply with SCADA and good communication system will reduce revenue loss and assure consumers satisfaction. This will also helps to adhere Standards of performance (SOP) guidelines.

(iii) To provide reliable electric supply to consumers and enhance the safety of operating personnel during operations for Load transfer and outage/maintenance arrangement of electrical equipments of RSS.

3.2 Scope of work:

(i) Replacement/Augmentation of Existing SCADA system for all RSS in BEST. Implementation of new Distribution management System (DMS), Outage Management System (OMS), Field Force Automation (FFA).

(ii) Supply, Installation, Testing, & Commissioning of IEC 61850 Ed II compliant Numerical Relay based SCADA system including hardware, software, accessories, relays& cabling for all RSS (110kV,33 kV, &22kV).

(iii) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, cabling, etc. for Distribution Management System at 870 strategic located DSS.

(iv) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, cabling, etc. for 1900 DSS to pick up status of EFPI.

(v) Supply, Installation, Testing, & Commissioning of software for Outage Management System (OMS)

(vi) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, cabling, etc at .Master Control Center (MCC) & Backup Control Center (BCC) .

(vii) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, etc for Field force Automation (FFA).

(viii) Integration of ADMS with existing GIS & proposed ongoing Automation projects like AMI, ERP, Call center, etc.

(viii) Installation of MPLS communication network main & backup for RSS, MCC, BCC. Installation of dual SIM based communication for all DSS.

(ix) Integration of ADMS with State Load Dispatch Center (SLDC), Kalwa.

(x) Cyber Audit of ADMS at half yearly by CERT-IN empanelled agency in order to ensure Cyber Compliance.

4. **Technical Justification**:

ADMS system is proposed in BEST as per guidelines of RDSS (Reforms Based & Results Linked) Chapter -2, Para 2.4.1, which proposes Supervisory Control and Data Acquisition (SCADA) and Distribution Management System (DMS) is proposed in urban areas, SCADA/DMS in 100 towns (approx.) with eligibility of towns having population > =1 Lakh in special category states and towns having population > = 2.75 Lakh in other states as per Census 2011 data, as well as all Capital/DISCOM HQ towns, if not covered earlier Scheme of PFC.

a) **Supervisory Control and Data Acquisition (SCADA) System for all O &M Zone**:

The Supervisory Control & Data Acquisition System (SCADA) is Automation solution for remote control, system monitoring and data acquisition of electricity distribution network through equipments installed in RSS, Zonal Control Centre (ZCC), Master Control Center (MCC), Backup Control Center(BCC). At present there are about 64 RSS in BEST and in next 5 years about 13 Nos. of new RSS will be coming up. SCADA system was installed at different time zone since 2003 to 2014 for 49 RSS.Now, out of 49 Nos. of SCADA enabled RSS, presently at 24 Nos. of RSS SCADA System is in partial operational state. All SCADA equipments are outdated from Hardware & Software point of view & are non-complying to Cyber Security Laws. As such it is proposed to install IEC 61850 –Ed II complied Numerical Relay Based SCADA System at all RSS (64 existing + 13 proposed RSS).

b) Distribution Management System (DMS):

It is proposed to implement DMS where in it is proposed to carry out electrical equipments automation at Strategic located existing 870 Nos. of DSS. It is also proposed to install FRTU, Relays, and MFTs for switchgear protection and accessories. FRTU will communicate with MCC & BCC on SIM based GPRS system. It will be possible to operate DSS equipments remotely to isolate the faulty section of 11kV distribution network. It is also proposed to install EFPI live status detection system at DSS,so that in case of cable fault, the Faulty section of 11kV distribution network can be identified & remote actions can be taken to isolate faulty zone. With this, Fault zone can be identified & supply can be restored to healthy section by issuing commands remotely.

c) Outage Management System (OMS):

It is also proposed to install Outage Management System (OMS) in which online data regarding outages issued, Faulty sections, corresponding affected consumer details shall be available. This will help key personnel's of Fault control, Fuse control to take proper decisions for supply fault categorization, & giving proper feedback to affected consumers.

d) Field Force Automation (FFA):

It is proposed to give mobile phones to actual field staff with an App so that officers at MCC/BCC/ Fault Control/Fuse Control can Monitor Crews online GPS position & can assign supply restoration jobs. Field crew can update supply position remotely through Mobile APP.

e) Integration of ADMS with other IT system:

It is proposed to integrate ADMS with other automation systems such as AMI, ERP, GIS, Call Center, SLDC, etc to optimise the resources of BEST.

f) Communication for ADMS:

It is proposed to install dual MPLS communication between MCC, BCC & all RSS. It is also proposed to have dual SIM based GPRS communication between MCC/BCC & all DSS. MPLS Communication link is also proposed for SLDC.

5. Brief Description of ADMS:

5.1 Components of SCADA System:

SCADA systems are mainly focused on data collection with supervision and respective controlling. SCADA system is regarded as a form of process control system architecture that incorporates computers, graphical human-machine interface, data communication network etc. in order to have supervisory management and high-level controlling.

Human –Machine Interface (MHI):

HMI is used as an acronym for human-machine interface and is given this name as it is a combination of software and hardware that permits human and machine interaction in the SCADA environment. This device aims to provide efficient system operation with proper controlling of the system which is under monitoring.

In small scale operations, the operator is allowed for the configuration of set points and algorithm in the controllers. While in large scale operations, the device provides status information and previous reports graphically to the operator or authorized users.

Components of HMI: Operator Console, Operator Dialogue, Mimic Diagram and Peripheral devices

1. **Functions of the HMI**:

(i) Visualizing data display.

(ii) Monitoring the inputs and outputs of the machines.

(iii) Tracking of production time, trends, etc.

(iv) Performing the required changes when needed.

2. **Remote Terminal Unit (RTU)**

Basically, it is used for remote telemetry and controlling of process. It is a microprocessor-based device that forms a connection with sensors, transmitters, and other equipment.

The RTU when connected with sensors and monitors at the remote site allows transmission of data to the central station where the task of collecting and monitoring is performed. Generally, serial ports (like RS232) are used to form communication between RTU and central stations.

3. **Intelligent Electronic Devices (IED)**:

IED are basically microprocessor-based controllers, relays and regulators, etc. that can serially communicate with the other devices of the SCADA system. More specifically, IED is a device that consists of microprocessors and holds the ability to transmit and receive data or control to or from any external device. The external devices can be transducer, relays, control units, etc.

4. **Programmable Logic Control (PLC):**

PLC controls the processes and equipment of the system. It is generally connected to the sensors and changes the sensor output signal into a digital signal. PLCs are used in place of RTUs as various advantages are associated with PLCs.

The advantages of PLC over RTU are as follows:

- The design of PLC is simple along with installation in comparison to RTU.
- The reliability offered by PLC is more than RTU.
- In case of errors, troubleshooting is easy as well as quick.
- PLC is more economical than RTU.
- PLCs are compact and require comparatively less space than RTU.

5. **Supervisory System:**

This system acts as a centralized server that maintains communication between various equipment of SCADA like RTU, sensors, etc. and HMI software. In the case of the smaller SCADA system, there is a single PC present in the supervisory station, but for large SCADA systems, there are multiple servers and distributed software applications.So, in these systems, the multiple servers are configured to continuously control and monitor the operations for enhancing the integrity of the system when any severe failure occurs.

6. Network Management Server (NMS):

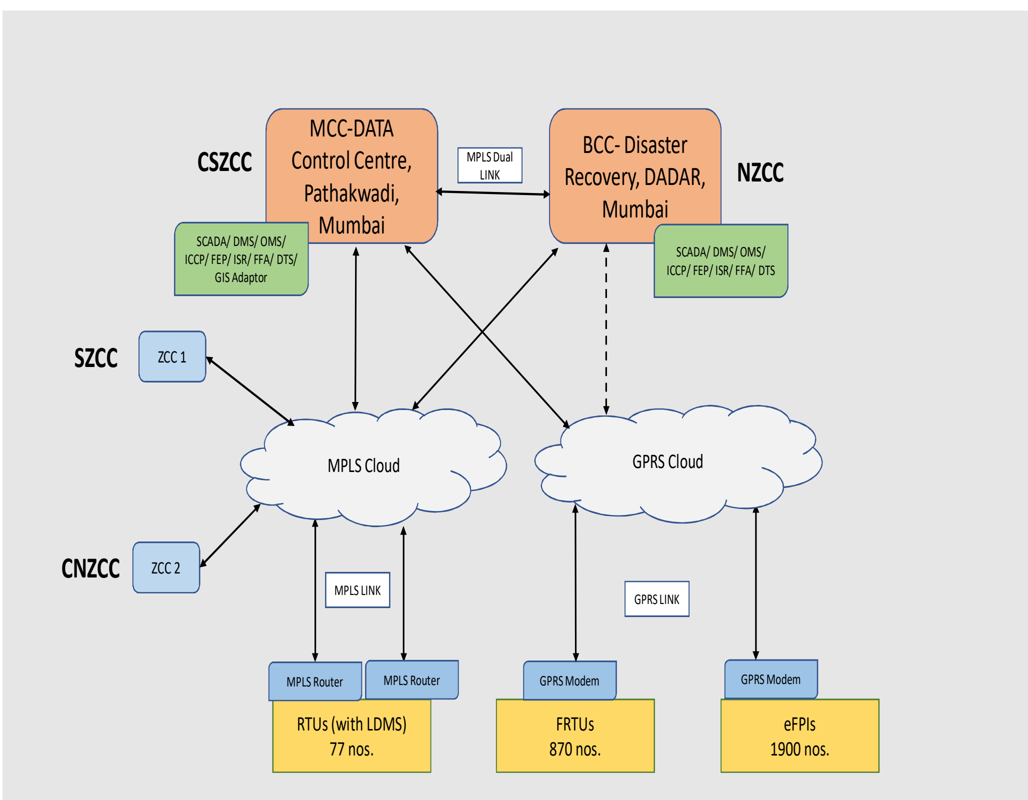
The Network Management Server (NMS) monitors the software as well as hardware components present in the network. With the help of the network administrator, the NMS manages an individual component of the network. It helps in recording the data from remote points and reports it to the system administrator.

Functions of NMS:

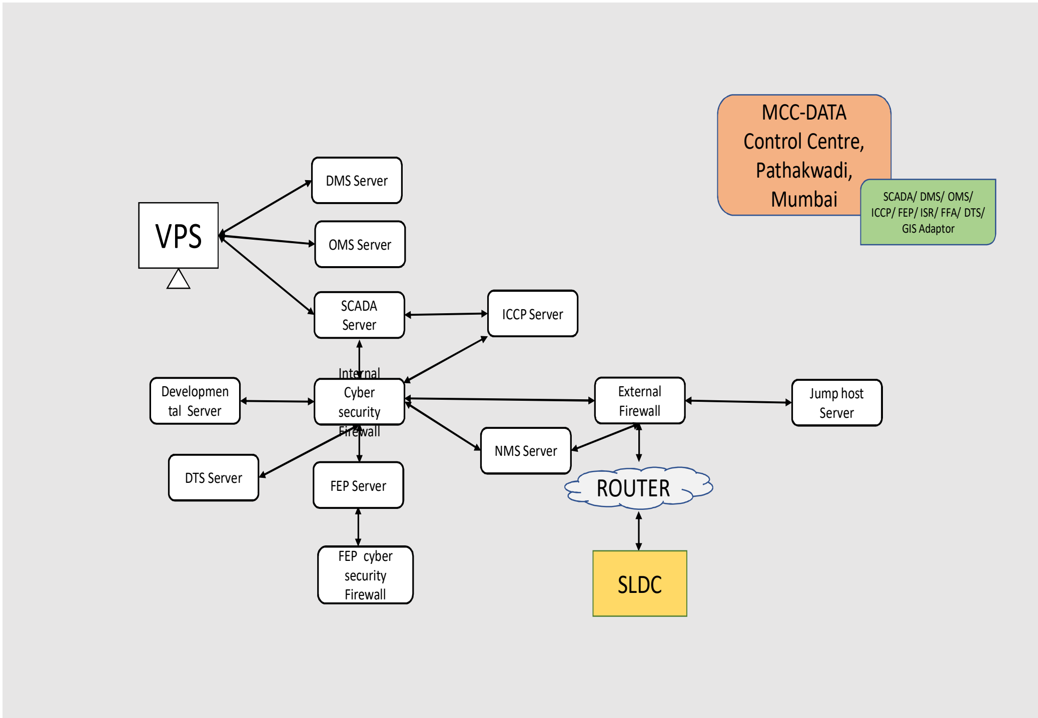
- Monitoring of the device
- Analysis of the performance
- Device discovery and management
- Analyzing notifications and alerts

5.2 ADMS (SCADA) Architecture:

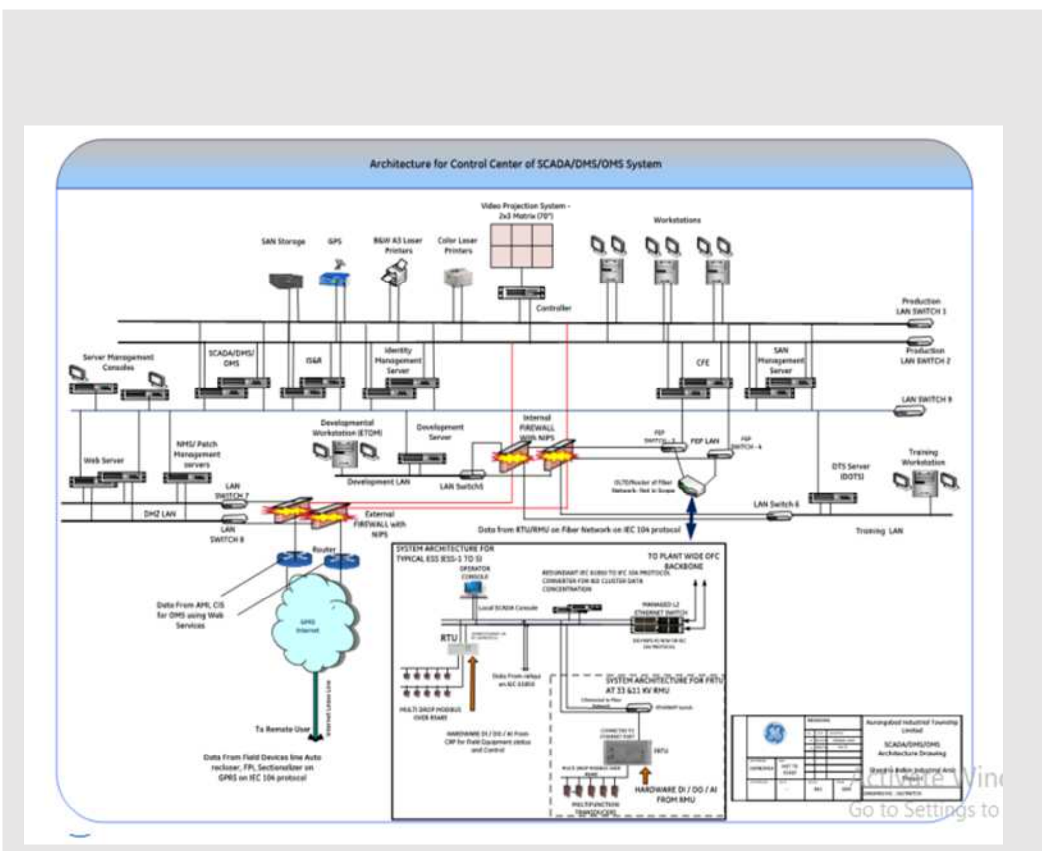
1. Proposed Overall Architecture of Master Control Center (MCC), Backup Control Center (BCC) and Zonal Control Center (ZCC):



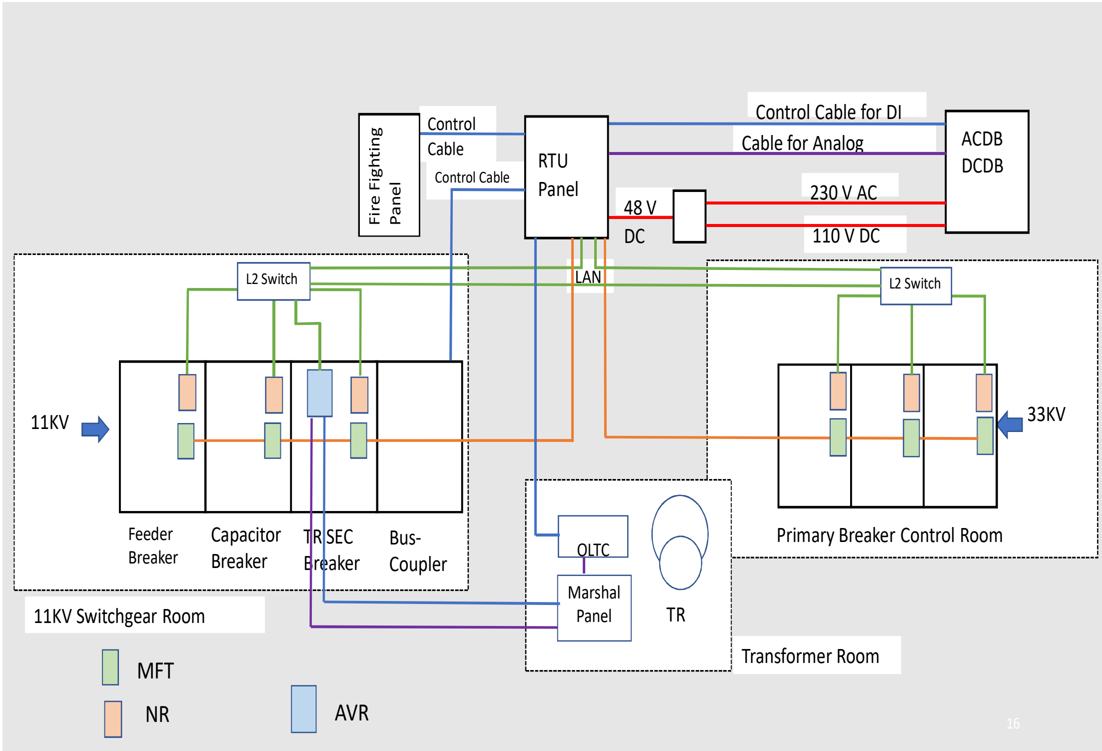
2. Project Architecture at MCC & BCC:



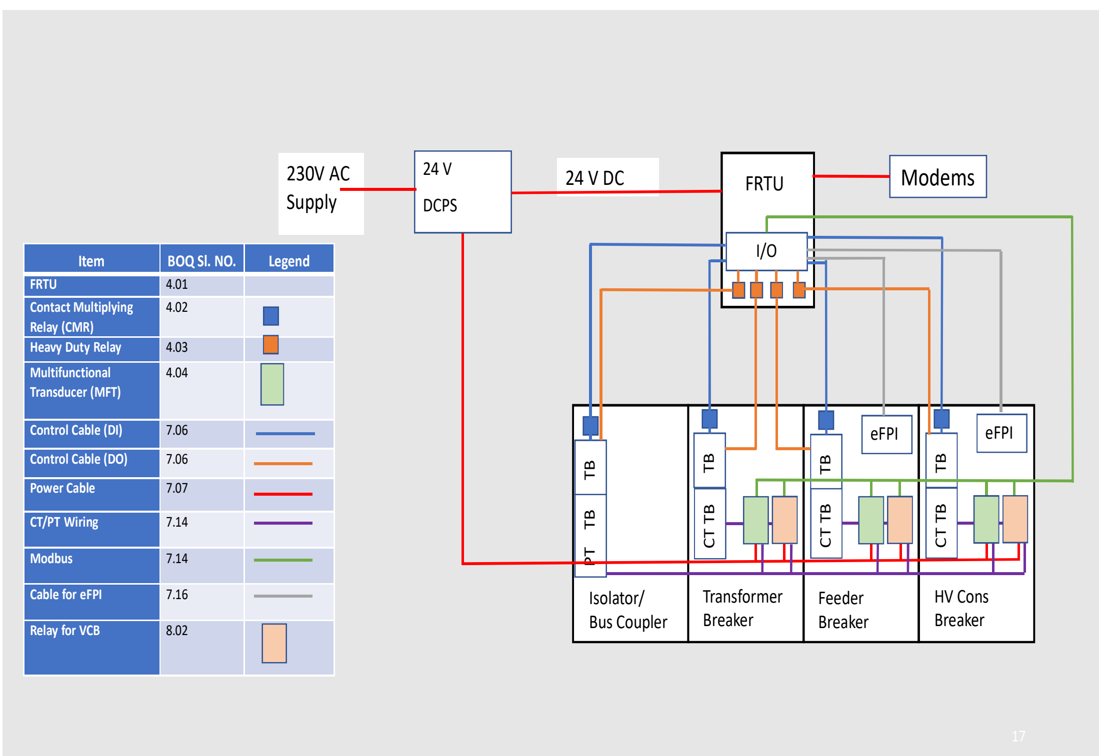
3. MCC,BCC Architecture:



4. Typical Architecture at RSS level (77 Nos.):



5. Typical Architecture at DSS: FRTU (Qty-870 Nos.):



6. **Advanced D**istribution Management System (**ADMS) Control Room**:

5.3 **Benefits of ADMS**:

5.3.1 The latest state of the art technology is being used as the powerful tool for electric 11 kV Distribution Network Management.With ADMS, BEST will be able to achieve the following:

a. Real time monitoring:

All electrical parameters like voltage, current, power factor, power transformer tap and loading etc. of the RSS, Strategic DSS are monitored on real time basis.

b. On-line control:

The switchgears are operated on-line for switching and load transfers. The power factor of the substation/receiving stations are monitored by on-line operation of the Capacitors. OLTCs are operated / monitored on-line to regulate the voltage profile.

c. Archiving of data

All above electrical parameters are archived at 10 to 15 min. interval. Report generation of archived data is utilized for various purposes like DMS, load forecasting, preparation of EquipmentMaintenance Schedules of RSS/DSS, etc.

d. Reduction of Skilled manpower at Receiving Stations:

Once ADMS is implemented in BEST then, all the operations at ADMS operated RSS/DSS areto be carried out from the MCC, BCC remotely. Subsequently, the requirement of manning RSS by skilled officer at every 33/22 kV RSS will be reduced resulting saving cost on manpower. However, the proposed skilled manpower at 110kV RSS will be remain unchanged by considering the importance and voltage level of RSS.

e. Reduction in fault isolation and restoration time

Due to implementation of ADMS, most of the operations would be made remotely and resulting reduction in fault isolation time and restoration time off supply, average interruption time will be reduced.

f. Other benefits are achieved after installation of such systems:

- Better quality of supply.
- Reduction in revenue loss.
- Efforts in travelling of Fault Engineer & its crew are minimized.
- Load forecasting & useful for future network system design.
- Increase in life of electrical equipments.
- Safety of operation staff enhances.
- Useful in Disastrous conditions like flooding, earthquake, etc
- Useful in festivals like Ganesh Utsav, Diwali, etc.
- System generated SOP parameters

6. Cost Sheet of ADMS:

Table 78: Cost Sheet of ADMS

SR. NO.	PARTICULARS	Gross Total with GST (in Rs.)
1	SCADA/DMS Cnotrol Center : C1 - Servers / Workstation Hardware , Storage & Backup Devices, Switches, Data Centre Router, Security system (DMZ), Software for Control Centre (For Main & Standby Server) & Mandatory Spares	115726397.490
2	SCADA/DI IS DR Control Centre D1 - Server/ workstation Hardware, Storage & Backup Devices, Switches, Routers, Security system (DMZ), Other Active Devices, Printers, Software for DR Centre (For Main & Standby Server) & Mandatory Spares	107238852.700
3	RTUs, Software for LDMS, Test Equipments for RTU & Mandatory Additional Spares	113030996.880
4	FRTUs, Test Equipments for FRTU & Mandatory Additional Spares	110242891.630
5	MPLS, GPRS & Mandatory Additional Spares	104784348.650
6	Main Equipments - Control centre, Main Equipments - DR Centre, For RTU/Data Concentrator/Communication Eqpts. FRTU, Remote VDU location & Mandatory Additional Spares.	42894940.920
7	FPI, Control/power/Communication cable for RSS and DSS and mandatory Additional Spares	259484919.170
8	IED Replacement & Mandatory Additional Spares	207470625.310
9	Comprehensive Facility Management System	457042907.000
10	Project Management Cost (Inclusive of GST)	303583375.950
		1821500255.70

For cost sheet, kindly refer Annexure-AP.

6.1 As per CAPEX Regulation, 2022, Appendix:3 (Guidelines for Procurement of material), a tender was invited and accordingly, a turnkey contract work order for contractual value of Rs. 182.15 Cr is placed on LAO i.e. on M/s. L & T Pvt. Ltd.

7. Cost Benefit Analysis of ADMS: For cost benefits/objectives of ADMS, kindly refer Para 5.3 of Section 4.

8. Phasing of ADMS

Table79: Phasing of Capital Expenditure and Capitalization

Particulars	**Total**	**Phasing of Capital Expenditure** ₹ in Cr.		
		23-24	**24-25**	**25-26**
Total CAPEX with PMA	182.15	87.37	53.65	41.13
Total Capitalization with PMA	182.15	87.37	53.65	41.13
PFC Approved CAPEX	143.72	61.76	37.05	44.91
PFC Approved Capitalization	143.72	61.76	37.05	44.91
Approved PMA Charges	2.16	0.93	0.56	0.67
60% Grant on PMA Charges	1.30	0.56	0.34	0.40
60% Grant on CAPEX	86.23	37.05	22.23	26.95
Total Grant with PMA	87.53	37.61	22.57	27.35

APPENDIX-4

1. Part1:

1.1	**Name of Applicant**: BEST (Brihanmumbai Electric Supply & Transport Undertaking)
1.2.	**Name of the Capital Investment Work**: Advanced Distribution Management System (ADMS) (Implementation of SCADA & DMS).
1.3.	**Nature of the Capex Scheme (New/ Resubmitted / revised / modified /extended)**:New CAPEX Scheme.
1.4.	**Details of the Location**: Mumbai circle (BEST's Licensee Area), Head quarter Coordination lat 18.9216780548024, long 72.8300250353453
1.5	**Date of Approval by Competent Authority designated by the Board of Directors of the Company**: *A copy of management approval for RDSS Scheme including "Implementation of Infrastructure works under Loss Reduction" is enclosed as* ***Annexure-E.***
1.6.	**Category of DPR**: This DPR Scheme falls under Regulation 3.1 & 3.9 of MERC (Approval of Capital Investment Schemes) Regulations, 2022. Category are as follows: **Sub Clause 3.1** (e) Increase in operational efficiency of existing system; (g) Replacement of the entire asset after completion of useful life and which has gone beyond repair (h) Improvement in power quality and reliability (k) Improvement in system parameters; (m) Asset replacement as envisaged under Regulation, 3.23 (n) New infrastructure for enhancement of security **Sub Clause 3.9** : (e) Capital Nature Schemes funded partially by Central or State Government Grants (RDSS); (k) Installation or up-gradation of Supervisory Control and Data Acquisition (SCADA); (l) Installation or up-gradation of communication and/or control equipment; (o) Improvement in consumer services; (p) Obsolescence of assets and absence of support from Original Equipment Manufacturer;
1.7.	Objective of the Capital Investment: -To harness the technological advancements for reduction of Off -Supply Duration to consumers. -To automate system to have system generated Reliable Indices such as SAIDI, SAIFI, etc. -To integrate System with NPP, SLDC, other automation system to generate meaningful reports. - To replace existing outdated system by state of art modern ADMS, Augmentation of scope of system to cover all 77 Nos. of RSS, 870 Strategic located DSS, OMS, FFA, Compliance to cyber security laws guidelines of CERT-IN.

1.8	**Need of Analysis**: GoI has launched RDSS to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25 and to improve consumer services.
1.9	**List of Identical schemes previously approved by the Commission and their progress report (5 years data):** Vide Letter reference No. MERC/CAPEX/2017-18/4759 dated 22.11.2017; DPR for SCADA was in-principally approved by the Hon'ble commission. However, in a BEST a Special Study Team (SST) was formed by our management to combine the various automation projects of supply branch. Accordingly a proposal was prepared combining requirement of all zones SCADA, DMS, OMS called as ADMS. Now, the same proposal is considered under RDSS, hence, earlier approved DPR works has not been taken up and the DPR was closed.
1.10.	**State Map showing Location of the Scheme (for Transmission)**- Not Applicable
1.11.	**Brief scope and specification of work**: (i) Replacement/Augmentation of Existing SCADA system for all RSS in BEST. Implementation of new Distribution management System (DMS), Outage Management System (OMS), Field Force Automation (FFA). (x) Supply, Installation, Testing, & Commissioning of IEC 61850 Ed II compliant Numerical Relay based SCADA system including hardware, software, accessories, and relays & cabling for all RSS (110kV, 33 kV, & 22kV). (xi) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, cabling, etc. for Distribution Management System at 870 strategic located DSS. (xii) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, cabling, etc. for 1900 DSS to pick up status of EFPI. (xiii) Supply, Installation, Testing, & Commissioning of software for Outage Management System (OMS) (vi) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, cabling, etc at .Master Control Center (MCC) & Backup Control Center (BCC) . (vii) Supply, Installation, Testing, & Commissioning of hardware, software, accessories, etc for Field force Automation (FFA). (viii) Integration of ADMS with existing GIS & proposed ongoing Automation projects like AMI, ERP, Call center, etc. (viii) Installation of MPLS communication network main & backup for RSS, MCC, BCC. Installation of dual SIM based communication for all DSS. (ix) Integration of ADMS with State Load Dispatch Center (SLDC), Kalwa. (x) Cyber Audit of ADMS at half yearly by CERT-IN empanelled agency in order to ensure Cyber Compliance. ***For copy of Specifications of above items, kindly refer Annexure-AQ.***
1.12.	**Any Reference of Study Report / recommendation of OEM/Expert:** An in house Special Study Team (SST) was formed by BEST to combine the various automation projects of supply branch. Accordingly a proposal was prepared combining requirement of all zones SCADA, DMS, OMS called as ADMS. Now, the same proposal is considered under RDSS.

1.13.	**Estimated Cost**: Rs.182.15 Cr. (FY 2023-24–₹87.37 Cr., FY 2024-25–₹53.65 Cr. and FY 2025-26-₹ 41.13 Cr., IDC is not included in the costing.
1.14.	**Time Frame of the expenditure:** Project completion Period 36 months.

Table 80: Time Frame of the Capex (ADMS)

Financial Year	Capex Expenditure (in Rs.)	Capitalisation (in Rs.)
2023-24	₹87,36,83,719.23	₹87,36,83,719.23
2024-25	₹53,64,77,920.17	₹53,64,77,920.17
2025-26	₹41,13,38,616.30	₹41,13,38,616.30
TOTAL	**₹182,15,00,255.70**	**₹182,15,00,255.70**

For time frame of this project, kindly refer Annexure-C, Pg. No. 16-17 of 56.

1.15. **Funding arrangement: For FY2023-24toFY 2031-32 (for 9 years from the date of contract).**

Table 81: Funding arrangement (ADMS)

Sources of Funds	**Amount (in Crs.)**	**Share (%)**
Debt (90% of balance cost)	85.16	47
Equity (10% of balance cost)	9.46	5
Grant (60% of approved cost)+PMA	**87.53**	48
Consumer Contribution/Deposit Works	-	-
Total	**182.15**	**100**

Please kindly note that PFC approved cost of ADMS project is Rs. 143.72 Cr. and Grand of Rs. 86.23 Cr. Shall be made available from GoI for this project which is 60% of approved cost. Also, PMA approved cost for RSS is Rs. 1.30 Cr. So, total Grant amount will be Rs. 87.53 Cr.

1.16 **Benefits/Impact on RSS Schemes**:

a. **Real time monitoring**:

All electrical parameters like voltage, current, power factor, power transformer tap and loading etc. of the RSS, Strategic DSS are monitored on real time basis.

b. **On-line control**:

The switchgears are operated on-line for switching and load transfers. The power factor of the substation/receiving stations are monitored by on-line operation of the Capacitors. OLTCs are operated / monitored on-line to regulate the voltage profile.

c. **Archiving of data:**

All above electrical parameters are archived at 10 to 15 min. interval. Report generation of archived data is utilized for various purposes like DMS, load forecasting, preparation of Equipment Maintenance Schedules of RSS/DSS, etc.

d. **Reduction of Skilled manpower at Receiving Stations**:

Once ADMS is implemented in BEST then, all the operations at ADMS operated RSS/DSS are to be carried out from the MCC, BCC remotely. Subsequently, the requirement of manning RSS by skilled officer at every 33/22 kV RSS will be reduced resulting saving cost on manpower. However, the proposed skilled manpower at 110kV RSS will be remain unchanged by considering the importance and voltage level of RSS.

e. Reduction in fault isolation and restoration time:

Due to implementation of ADMS, most of the operations would be made remotely and resulting reduction in fault isolation time and restoration time off supply, average interruption time will be reduced.

f. Other benefits are achieved after installation of such systems:

- Better quality of supply.
- Reduction in revenue loss.
- Efforts in travelling of Fault Engineer & its crew are minimized.
- Load forecasting & useful for future network system design.
- Increase in life of electrical equipments.
- Safety of operation staff enhances.
- Useful in Disastrous conditions like flooding, earthquake, etc
- Useful in festivals like Ganesh Utsav, Diwali, etc.
- System generated SOP parameters

on tariff by considering 60% Grant and without Grant is given below:

Table 82: Tariff Impact with & without GBS(Grant)

F .Y.	23-24	24-25	25-26	26-27	27-28	28-29
With Grant	0.0099	0.0244	0.0316	0.325	0.0310	0.0296
Without Grant	0.0174	0.0427	0.0583	0.0629	0.0600	0.0574

Tariff impact with Grant and without Grant is worked out and same is shown in the above table. ***For Tariff impact with Grant and without Grant, kindly refer Annexure-AR & Annexure-AS respectively.***

1.17. Overall Cost-benefit Analysis:

Due to implementation of this scheme, there is no direct tangible cost benefit; however, implementation of ADMS envisaged under RDSS scheme will help BEST to achieve the objective to harness the technological advancements for reduction of Off -Supply Duration to consumers, to automate system to have system generated Reliable Indices such as SAIDI, SAIFI, etc.

2. PART-II: Particulars of ERP, Billing software, IT/OT and MDM furnished for justification of works

2.1	**Need of the investment**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' are to achieve an efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like high AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas being concentrated by the government for the development of country. The government has taken initiatives for (i) complete revamping of power sectors electrical equipment across the country and (ii) for the need of changing the way of operation and control of the electrical equipment. Accordingly,, Govt. of India has launchedthe RDSS to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. Objective of the Capital Investment: -To harness the technological advancements for reduction of Off -Supply Duration to consumers. -To automate system to have system generated Reliable Indices such as SAIDI, SAIFI, etc. -To integrate System with NPP, SLDC, other automation system to generate meaningful reports. - To replace existing outdated system by state of art modern ADMS, Augmentation of scope of system to cover all 77 Nos. of RSS, 870 Strategic located DSS, OMS, FFA, Compliance to cyber security laws guidelines of CERT-IN.

2.2	**Time lines of the Project:** 1. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.1), project approval date was 31.03.2023. As per guidelines BEST had prepared Action Plan and DPR for FY 2023-24, FY2024-25 & FY2025-26 by considering the audited annual accounts for FY 2019-20 & FY2020-21 and submitted to the Executive Director (IPDS), PFC on 22.08.2022. 2. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.2), the last date for completion of this scheme will be 31.03.2026. The works executed beyond this time lime will not be eligible for getting grant of GoI.***For time line of the project, kindly refer Annexure-C, Pg. No. 16-17.***
2.3	**Scheme for revised approval/scope/cost**: New Capex Scheme
2.4	**Proposed Capital Investment Scheme**: Implementation of ADMS (SCADA & DMS) in BEST by appointing the Implementing Agency.
2.5	**Technical Justification**: 1. Govt. of India has launchedthe RDSS to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. 2. **MYT Regulation:** As per Clause No. 74.1 of MYT Regulation 2019, BEST has submitted DPR for strengthening and augmentation of its distribution network meeting the requirement of load growth, reduction in distribution losses, improvement in quality of supply, reliability, reduction in congestion, etc. 3. As per Capex Regulation, 2022, this scheme falls under Regulation 3.1 & 3.9 of MERC (Approval of Capital Investment Schemes) Regulations, 2022. Category are as follows: **4. Sub Clause 3.1** (e) Increase in operational efficiency of existing system; (g) Replacement of the entire asset after completion of useful life and which has gone beyond repair (h) Improvement in power quality and reliability

	(k) Improvement in system parameters; (m) Asset replacement as envisaged under Regulation, 3.23 (n) New infrastructure for enhancement of security **5. Sub Clause 3.9** (various categories under which Distribution Business/Licensees may file) (e) Capital Nature Schemes funded partially by Central or State Government Grants (RDSS); (k) Installation or up-gradation of Supervisory Control and Data Acquisition (SCADA); (l) Installation or up-gradation of communication and/or control equipment; (o) Improvement in consumer services; (p) Obsolescence of assets and absence of support from Original Equipment Manufacturer; Existing SCADA System was commissioned before 2014 and the Life of existing SCADA System is completed. Now due to technological advancement, the SCADA System available in the market is not compatible with existing SCADA System. Hence, it is necessary to replace the same with advanced SCADA System..
2.6	**Financial Justification:** 1. As per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilize internal funds for executing all its Capital Expenditure plans. But due to financial crunch for in house schemed Best has decided to utilize 30% equity from internal sources and balance debt portion of 70% will be borrowed from financial institutions such as REC, PFC, Banks, etc. 2. In RDSS Project, for infrastructure works, GoI has sanctioned 60% Grant against sanctioned DPR Cost. For ADMS commissioning work, GoI has approved Rs.86.23 Cr Grant as against approved project cost of Rs. 143.72 Cr. Further to this, Rs. 2.16 Cr. Amount is sanctioned for PMA and Grant against this PMA cost will be Rs. 1.29 Cr. So, total Grant available for RSS project will be Rs.87.52 Cr. 3. For execution of RSS project actual cost arrived by tendering process is Rs.204.76 Cr. Out of which Rs.86.23 Cr will be the grant amount and balance Rs. 118.53 Cr will be the amount which will be borne by BEST. Also, Rs.3.07 amount is arrived for PMA and grant amount will be Rs.1.30 Cr, Total Grant amount will be Rs.87.53 Cr against total tender arrived cost of Rs.206.81 Cr. Out of Rs.119.28 Cr equity amount will be 10% i.e. Rs11.93 Cr. and balance 90% amount of Rs. 107.35 Cr. Will be made through debt. 4. BEST has applied to REC for loan amount for execution of RDSS.
2.7	**Consent of M-DNAC**: As per Electricity Act, 2003, Clause, 42(3), BEST undertaking being a local authority, hence exempted from open Access.

2.8 **Plan of other Transmission Licensees / CTU**: DPR is related to Distribution Licensees, hence Not Applicable.

2.9 **Phasing of Investment** :

Table 83: Phasing of Investment

Financial Year	Capex Expenditure (in Rs. Cr.)	Capitalisation (in Rs. Cr.)
2023-24	₹87.37	₹87.37
2024-25	₹53.65	₹53.65
2025-26	₹41.13	₹41.13
TOTAL	₹182.15	₹182.15

2.10 **Statutory/Safety Requirement: N.A**

2.11 **Cost Assessment /Cost Break-up**:For detail cost break-up, Annexure-AN.

Table 84: Cost Break-up

Sr. No.	Particulars	Total Cost with GST (in Rs.)
1	SCADA/DMS Control Center : C1 - Servers / Workstation Hardware , Storage & Backup Devices, Switches, Data Centre Router, Security system (DMZ), Software for Control Centre (For Main & Standby Server) & Mandatory Spares	115726397.5
2	SCADA/DI IS DR Control Centre D1 - Server/ workstation Hardware, Storage & Backup Devices, Switches, Routers, Security system (DMZ), Other Active Devices, Printers, Software for DR Centre (For Main & Standby Server) & Mandatory Spares	107238852.70
3	RTUs, Software for LDMS, Test Equipments for RTU & Mandatory Additional Spares	113030996.88
4	FRTUs, Test Equipments for FRTU & Mandatory Additional Spares	110242891.63
5	MPLS, GPRS & Mandatory Additional Spares	104784348.65
6	Main Equipments - Control centre, Main Equipments - DR Centre, For RTU/Data Concentrator/Communication Eqpts. FRTU, Remote VDU location & Mandatory Additional Spares.	42894940.92
7	FPI, Control/power/Communication cable for RSS and DSS and mandatory Additional Spares	259484919.17
8	IED Replacement & Mandatory Additional Spares	207470625.31
9	Comprehensive Facility Management System	457042907.00
10	Project Management Cost (Inclusive of GST)	303583375.95
	Grand Total in Rs.	**1821500255.70**

As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022, BEST was invited and finalised tender to appoint “Project Implementation Agency” with a transparent, competitive, fair and reasonable procedure. Subsequently, ***a copy of a Letter of Award (LoA) has been issued to M/s Larson and Toubro Ltd. which is enclosed as Annexure-H.For cost details, kindly refer Annexure-AP.***

2.12	**Least Cost analysis /Alternatives**: 1. For "Implementation of ADMS Works" project under RDSS by appointing 'Implementing Agency' a tender was invited and subsequently, A ***Letter of Award (LoA) has been issued to M/s L & T Ltd. is enclosed as Annexure-H, Pg. No. 55 to 66 of 70.*** 2. As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations,2022 BEST was invited and finalised tender to appoint Agency for Implementation of RSS Project with a transparent, competitive, fair and reasonable procedure. 3. Accordingly, the unit cost is derived from the open tender invited by advertising and following up the procure mentioned in Apendix-3. The order was placed on the technical suitable and LAO. 4. **Details of offers received for Implementation of ADMS:**A per CAPEX Regulation, 2022, Appendix-3, tender for "Implementation of ADMS by Appointing ADMS-IA, techno-commercial bid opened on 09.01.2023 and price bid opened on 13.01.023 in which 3 Nos. of bidders were quoted for said work. Details of offers received are given in the following table.

Table 85: ADMS Tender Comparative Statement

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking
1	**Larsen & Toubro Ltd.**	**204,75,52,097.77**	**1 (LAO)**
2	Enzen Global Solutions Pvt. Ltd	231,52,91,422.95	2
3	The Tata Power Co. Ltd.	338,58,91,609.98	**3**

The tender is awarded to the LAO viz. Larsen & Toubro Ltd. and comparative table for the total contractual value is given in the above table.***For details, kindly refer, Annexure-E.***

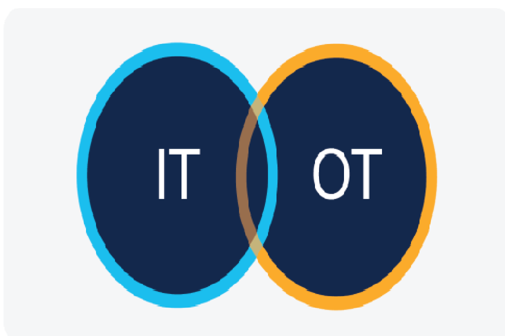
2.13	**If not and if Deferred Analysis**: For this case not applicable.
2.14	**Overall Cost-benefit Analysis**: Due to implementation of this scheme, there is no direct tangible cost benefit; however, implementation of ADMS envisaged under RDSS scheme will help BEST to achieve the objective to harness the technological advancements for reduction of Off -Supply Duration to consumers, to automate system to have system generated Reliable Indices such as SAIDI, SAIFI, etc.

2.15	**Methodology of Put to use of the asset and computing Percentage utilization of Project**: During the Financial Year (April to March), when the capital Expenditure made on execution of capital scheme and when this asset is "PUT TO USE" then only considered for capitalization purpose. Otherwise, said asset will be shown as WIP and IDC will be made applicable to this Scheme.
2.16	**Constraints:** The ADMS project include automation of both 33/11 kV RSS and 11/0.415kV DSS. There could be issue of getting the 'shut down' of the equipment where automation is to be done. The problem would be more acute during summer due to peak load existing at that time. In some cases outage would not be possible due to fault in the associated network.
2.17	**Inclusion in STU Plan/License for Transmission Projects. Recommendation of the Transmission Planning Committee as provided in the Grid Code:** This is not applicable to this DPR.
2.18	**Works intended for adaptation of latest Technology/Improvement/Up gradation of Existing Infrastructure:** Latest Technology with Cyber Security will be in place.
2.19	**Upstream/Downstream arrangement:** For this DPR such arrangement is not applicable.
2.20	**Statutory Clearances and Project Layout:**Not Applicable.
2.21	**Detailed Survey**: For execution of the scheme detail survey is already carried out by project implementing agency.
2.22	**Past Trend and Future projection**: An in house Special Study Team (SST) was formed by BEST to combine the various automation projects of supply branch. Accordingly a proposal was prepared combining requirement of all zones SCADA, DMS,OMS called as ADMS. Now, the same proposal is considered under RDSS.
2.23	**Detailed Justification for quantity proposed:** All the Receiving substation and strategic located about 33% DSS proposed presently for automation.
2.24	**Check list of the documents appended:** 1. DPR in the MERC Format for FY2023-24 to FY2025-26 2. Pat-I and Part-II Filled Formats of Capital Investment Scheme for MERC Approval 3. Annexure-B:- Guidelines for procurement of materials 4. Annexure-C: - Guidelines of RDSS 5. Annexure-D: - BEST Submission & PFC approval copy 6. Annexure-E: - A copy of Management Approval (BCR) 7. Annexure-H: - A Letter of award of contract M/s L& T Ltd. 7. Annexure-AP: - Cost sheet of ADMS 8. Annexure-AQ: - Specifications of ADMS 9. Annexure - AR:- Tariff Impact with Grand of ADMS 10. Annexure-AS:- Tariff Impact without Grand of ADMS

SCHEMES EXECUTED UNDER RDSS (LOSS REDUCTION)

SECTION 5

IMPLEMENTATION OF ENTERPRISE RESOURCE PLANNING (ERP), BILLING SOFTWARE AND IT/OTENABLEMENT WORKS



4.12-SECTION-5

1. INTRODUCTION:

1.1 The Government of India's initiatives like 'Make in India' and 'Smart Cities' need the efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas to concentrate by governments for the development of country. The government cannot take initiatives for complete change of electrical equipment across the country but there is a need for changing the way of operation and control of the electrical equipment.

1.1.1 Accordingly, Government of India (GoI) has launched the Revamped Distribution Sector Scheme (RDSS) to help DISCOMs to improve their operational efficiencies and financial sustainability by providing result-linked financial assistance to DISCOMs to strengthen supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. Main objective of the scheme is Reduction of AT&C losses to pan-India levels of 12-15% by 2024-25 and Reduction of ACS-ARR gap to zero by 2024-25. Also, improvement in the quality, reliability and affordability of power supply to consumers through a financially sustainable and operationally efficient distribution sector.

1.2 As per RDSS guidelines (Chapter-2, Para-2.4.1), the schemes of IT/OT works, Supervisory Control and Data Acquisition (SCADA) and Distribution Management System (DMS) in urban areas is covered under RDSS as per requirement of Utility.

1.2.1 As per IPDS guidelines (Chapter-II, Clause (a) (x) of Para-2,), Under IT Applications, schemes for Enterprise Resource Planning (ERP) and IT enablement Works of Distribution Sector was envisaged to be covered as per requirement of utility. However, at that time BEST was not proposed this work under IPDS. Now, by considering the necessity of ERP and IT enablement Works, the DPR for the same was prepared along with the DPR of IT/OT Works, SCADA & DMS in urban areas (kindly refer above Para 1.2) and submitted to the Monitoring Committee of MoP / GoI which is sanctioned by the Committee vide PFC Letter No. 02: 10: RDSS: 2021: I: BESTdated21st, November, 2022.

1.2.2 IT enablement will enable improvement in Consumer satisfaction and power supply reliability and ultimately reduction of AT&C losses with the help of accurate measurement and proper Energy Accounting and Auditing. This is also required in view of the monitoring of all 11 KV Feeders in the country through National Power portal (NPP). Hence, it is prudent to implement IT based system in small towns also across the entire state to derive maximum benefits with incremental investment.

1.2 The current system such as CM, CRM which is being used in the Customer Care was installed in year 2010. Now, the current system is outlived and there is lot of changes in technology. Due to up-gradation in Technology, the current system is not compatible with upgraded version. The consumer billing module is also outlived. Till date BEST has not implemented SAP/ERP, IT/OT, and AMI like systems to improve the consumer services. Inlast decade there is lot of changes happened in the technology and most of the DISCOMs are now accepting the technological advancement in the system. It is observed that there is large amount of changes in the business processes of DISCOMs. To follow the SOP guidelines and to improve our Business indices, it is necessary to implement ERP, Billing Software and IT/OT enablement works.

1.3 This DPR covers (A) IT System Implementation Phase which cover (i) ERP, MBC & other associated System software (License component), (ii) ERP, MBC & Other System Implementation (iii) Training during Implementation (iv) Cloud DC & DRC during Implementation (v) Supply, Setup & Installation of Call Center (B) IT System ATS (Annual Technical Support) for IT Application System, it covers, IT System ATS for ERP, MBC & DMS (C) IT System Clod for IT Applications, it covers Cloud Service Provider (CSP) Services for ERP, MBC & DMS (D) Facility Management Services (FMS) covers Support Service cost i.e., cost for ERP, MBC & DMS Facility Management & any other Service Support after post implementation (E) Operation & Maintenance (O&M) Services covers call Center Management Service.

1.4.1 Details of ERP System Utility Solutions, Core Module and Other Functions are listed below:

(A) ERP System –Core Module covers (i) Finance and Account Management (ii) Material Management (iii) Human Resource (HR) Management (including Payroll and Employee self service) (iv) Asset Maintenance Management (including work permit System) (v) Project Management /Project Execution and Budgeting (vi) Sales Management (Scrap Sales Process) (vii) Business Reporting

(B) ERP System – Utility Solutions covers (i) Metering, Billing & Collection (MBC) System- core electrical utility solutions (ii) Meter Data Management (iii) Billing System Revenue Management (iv) Customer Services (New Service Connection, Disconnection, /Customer Relationship Management (CRM) including Call Center Applications (v) Integration with GIS (vi) Integration with ADMS & SCADA (vii) Integration with e-mails, SMS and WhatsApp Messaging services and payment Gateway.

(C) ERP System –Other Functions covers (i) Data Management and Business Analytics Solution (ii) Unified Consumer Self Service Portal with Chatbot and Mobile adoptable (iii) Unified Employee Self Service Portal with Chatbot and Mobile adoptable (iv) Project Training (v) Training for Technical /Functional/Core Users/ Power Users/Business Users/ Customers/vendors as desired.

1.5 Brief Description of the (A) Enterprise Resource Planning (ERP) (B) Billing Software (C) IT Enablement (D) and OT Enablement Works

(A) (i) Introduction of ERP:

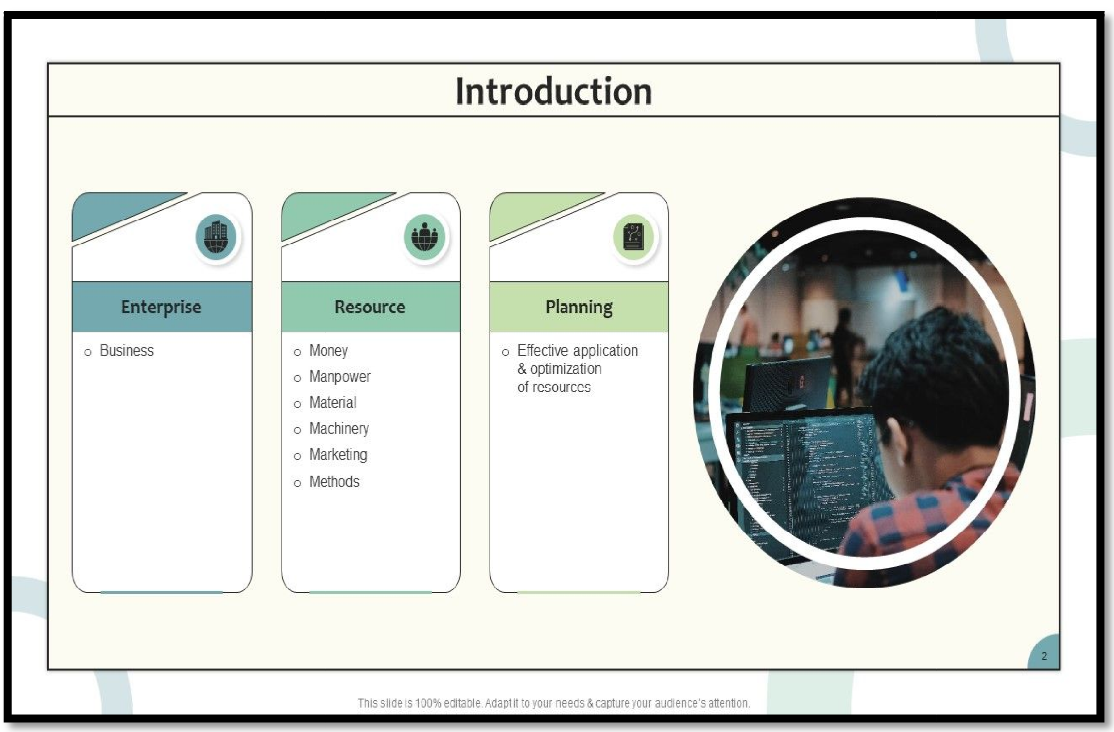
- ERP is an integrated computer based system used to manage internal and external resources including tangible assets, financial resources, material and human resources.
- Its purpose is to facilitate the flow of information between all business functions inside the boundaries of the Organisation and manage the connections to outside stakeholders.
- Built on centralised database and normally utilising a common computing platform, ERP system consolidate all business operations into a uniform and enterprise wide system environment.
- It harnesses organisational resources in an integrated manner to improve overall profitability.
- Employing proven business processes for decision making and
- Providing high degree of cross functional integration among Finance and Account Management, Material Management, HR Management, Asset Maintenance Management, Project Management /Project Execution and Budgeting, Sales Management, Business Reporting, etc.
- Organises and optimizes the data input methodologies systematically.

(ii) BEST has proposed ERP system components which are listed below:

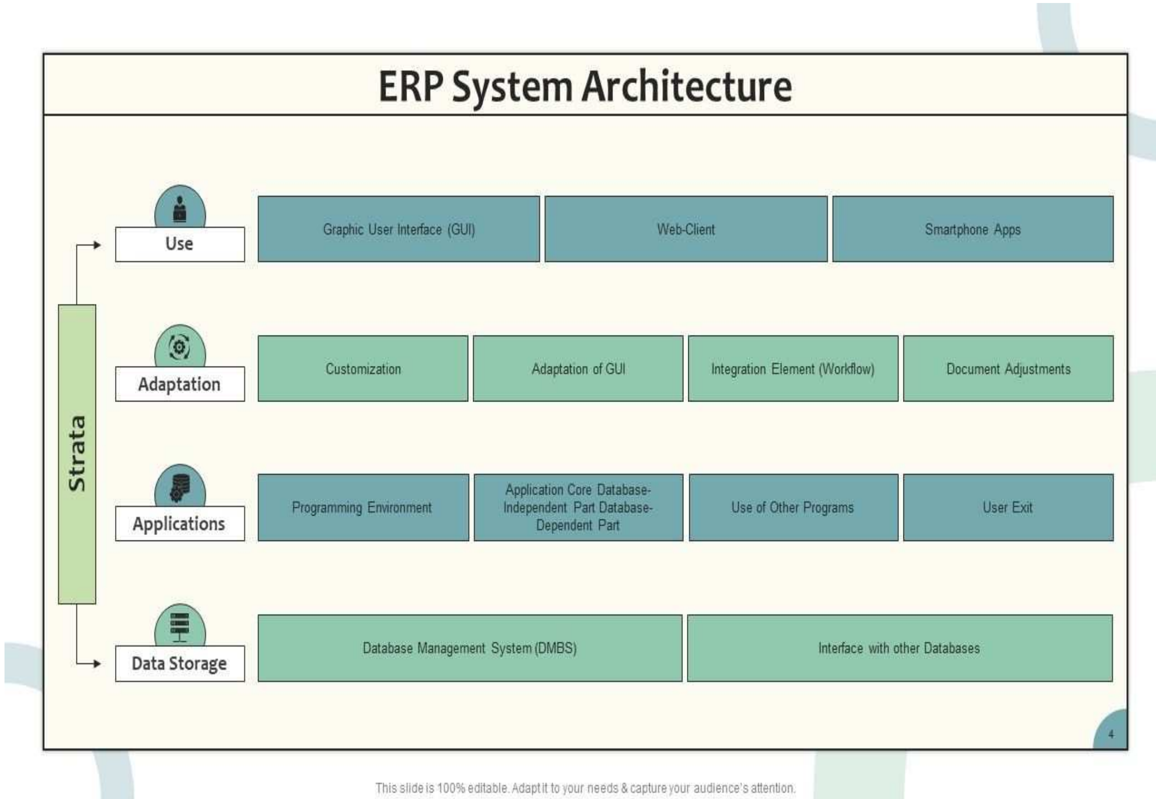
- Financial and Accounting Management with Treasury and Risk Management, Materials
- Inventory, and Procurement Management
- Human Resource and Payroll including Employee Self Service
- Asset Management and maintenance (including work permit system)
- Project Management/Project Execution and Budgeting
- Sales Management (Scrap Sales process)
- Electrical Network Management Consumer Indexing
- Call centre application including integration with MBC, CRM, GIS

- Consumer Indexing
- Off supply and Fault control management
- Document Management System
- Trust Management (Provident Fund etc.)
- Business Intelligence and warehouse with Advanced Consumer Analytics
- Management Information System (MIS)
- Reports and Dashboards
- Unified Consumer Self Service Portal with chatbot and mobile adoptable
- Unified Employee Self Service Portal with chatbot and mobile adoptable
- Operational training to the core committee and end user whenever modifications in the system
- Handing over the all the authority rights acquired during the project period and under the scope of the project on the name of BEST
- MeitY empanelled cloud services for hosting all-IT solutions
- World class Customer Call Centre to take their consumer interaction experience to next level with analyticsetc.

ERP System:



(iii) General ERP System Architecture



(iv) Various Business Reporting General ERP Modules are shown below:
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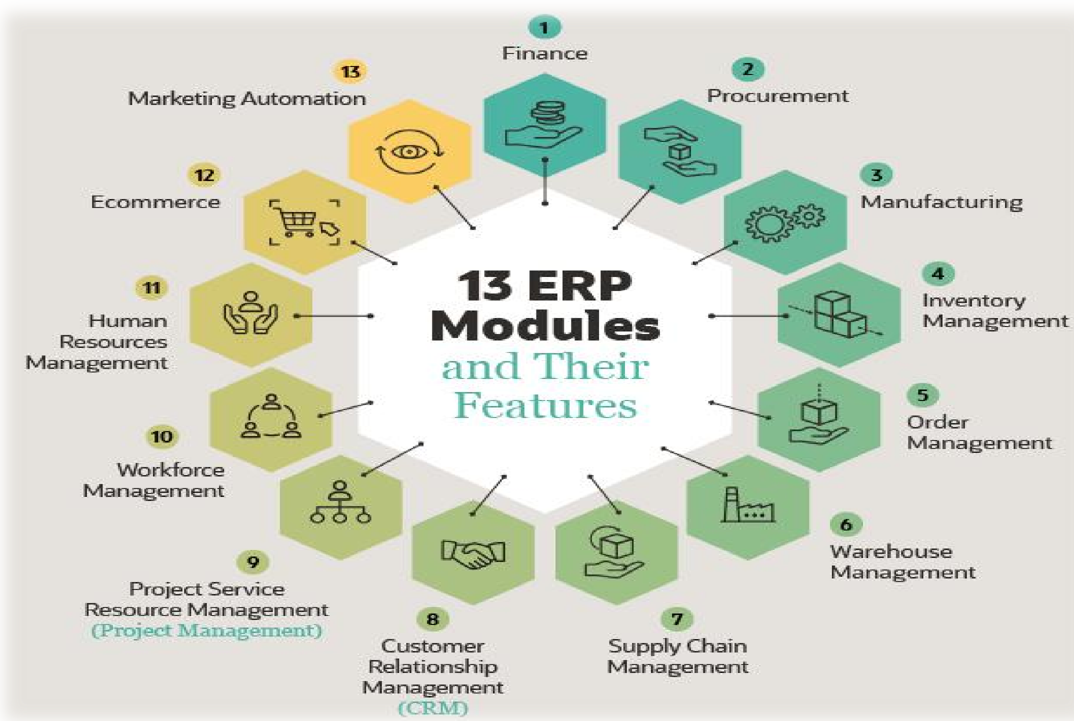


(v) Benefits of ERP:

- Increased Efficiency
- Improved Collaboration
- Real-time Data & Enhanced Reporting Built-in Compliance
- Cloud Accessibility
- Better Customer Service
- Flexibility
- Long-Term Cost Savings

(B) Billing Software:

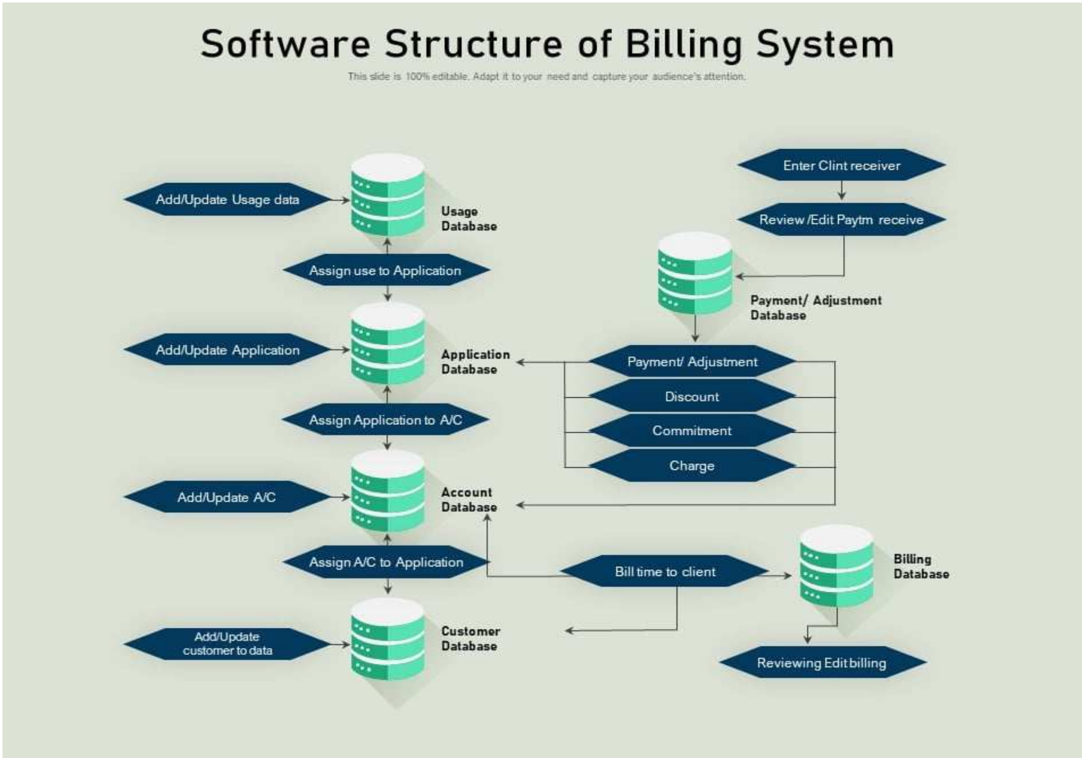
(i) Introduction: BEST is committed to quality supply and correct meter reading to the consumers. BEST has proposed to install about 10.80 Lakh Prepaid Smart Meters and contract order for the same is allotted to M/s. ATL. However, Billing software and MDM is not included in the order. You may be aware that the basic purpose of billing software is to automate and streamline the billing process. It helps businesses save time, reduce errors, and improve overall efficiency.

(ii) Utility Billing software Solutions are either on-premises or cloud-based. These software Solutions are integrated platforms designed to reduce cost-to-serve and deliver excellent service. Also, it helps Customer Care to billing and revenue management etc, Modern Billing software solutions enable complex price plans and dynamic tariff models with personalized offers, including, promotions, discounts, contracts & terms.

(iii) The Energy Billing System is an Executive information system that could be used for entering, calculating and monitoring billing details of the electricity consumers. It provides the environment to maintain the consumer details starting from consumer new connections, receiving bill, payments, etc, and performance information to the management. It would be an Intranet or Internet based software solution.

(iv) Need of Billing Software: Billing Software is useful for Electricity Business because it helps streamline and automate the billing process, saving time and reducing the risk errors. With billing software, you can create invoices and send to customers electronically, track payments and overdue balances, and generate reports to get an overview of your billing and financial performance. Some billing software also integrates with other business tools, such as accounting software and customer relationship management (CRM) systems, to provide view of your business operations.

(v) General Software Structure of Billing System:



(vi) Features to look for in billing software:

- It should be compatible with your existing accounting software. It will save you time and hassle in the long run, as you won't have to enter data into two separate systems.
- It should automate maximum processes. That includes automatic invoice generation, recurring invoices, and payment processing. The more automated the software is, the less time you'll spend on monthly bills.
- It should offer excellent customer support. This is important if you run into software problems or have questions. Look for a company that offers 24/7 support so you can always get help when you need it.

(vii) Benefits of billing software: There are many benefits of billing solutions for businesses which are listed below.

- Save time and money

- Manage Customer and Utility Database
- Accurate billing calculation
- Increase flexibility in implementation of the tariff changes
- and regulatory guidelines
- Seamless integration with systems like ERP, MDMS,GIS

(C) IT Enablement Works:-

(a) IT Enablement Works: Information Technology(IT) is the backbone of utility and it is necessary for monitoring, managing and securing core functions such as finance, HR and other core business applications.

(b) Components of IT infrastructure:

Hardware: It includes servers, data centres, personal computers, routers, switches, and other equipment, etc.

Software: Software refers to the applications used by the utility, such as web servers, content management systems, and Operating System (OS).

Networking: The network consists of internet connectivity, network enablement, firewalls and security, as well as hardware like routers, switches, and cables.

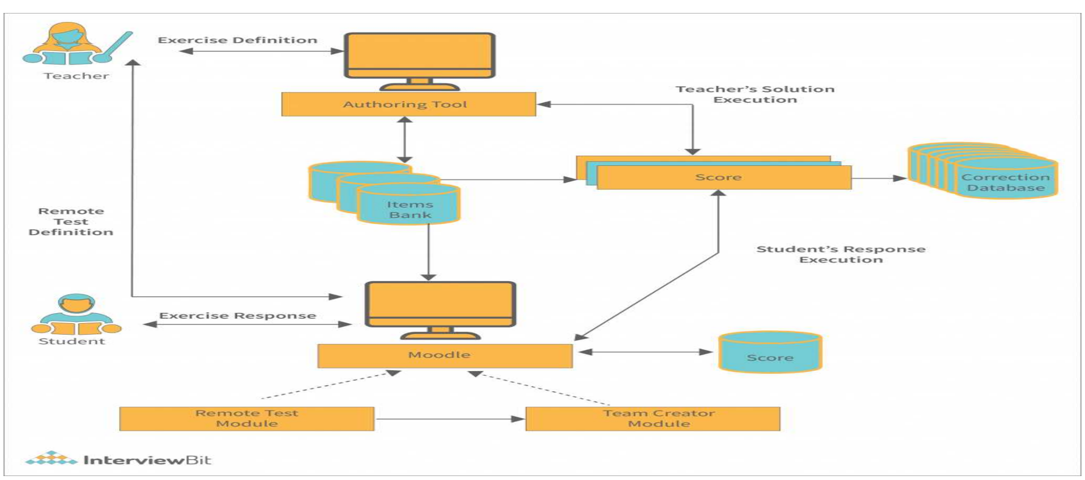
(c) Types of IT infrastructure:

Traditional infrastructure: It includes the components such as Data Centres, Data Storage and other equipment, etc.

Cloud infrastructure: It describes the components and resources needed for cloud computing.

Hyper converged infrastructure: It allows managing your computer, network, and data storage resources from a single interface.

(d) Typical IT Architecture diagram



(e) IT infrastructure management: Most common technology infrastructure management types:

OS management: Oversees environments running the same OS by providing content, patch, provisioning, and subscription management.

Cloud management: It gives cloud admins control over everything running in a cloud, end users, data, applications, and servicesby managing resource deployments, use, integration, and disaster recovery.

Virtualization management: Interfaces with virtual environments and the underlying physical hardware to simplify resource administration, enhance data analyses, and streamline operations.

IT operations Management: Also known as business process management, this is the practice of modelling, analyzing, and optimizing business processes that are often repeated, ongoing, or predictable.

IT Automation: Creates repeatable instructions and processes to replace or reduce human interaction with IT systems.

Container orchestration: Automates the deployment, management, scaling, and networking of containers.

Configuration Management: Maintains computer systems, servers, and software in a desired, consistent state.

API Management: Distributes, controls, and analyzes the Application Programming Interfaces (APIs) that connect apps and data across enterprises and clouds.

Risk management: Identifies and assesses risks and creates plans to minimize or control those risks and their potential impacts.

Data management: Gathers, stores, and uses data, allowing organizations to know what data they have, where it is located, who owns it, who can see it, and how it is accessed.

(D) OT Enablement Works: Operational Technology (OT) is a computing and communication System to manage, monitor and control the utility operations with focus on the physical devices and processes.

(a) OT Devices:

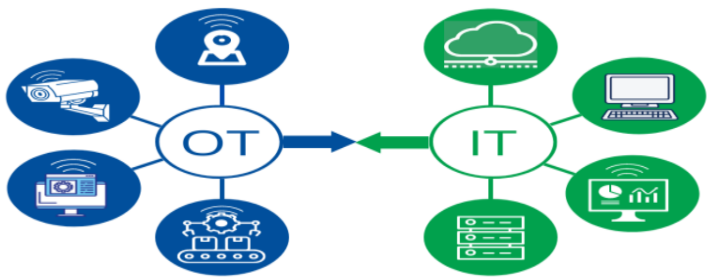
- Programmable logic controllers (PLCs)
- Remote terminal units (RTUs)
- Human machine interfaces (HMIs)
- Distributed control systems (DCSs)
- Internet of things (IoT) devices.
- Industrial internet of things (IIoT or Industry 4.0) devices.

- Pumps.
- Switches.

(b) IT/OT Benefits:

- Better Decision Making
- Smaller cost greater value
- Lower Risk
- Standardization

(c) IT/OT Architecture:



2. Objective of ERP & Scope of Work:

2.1 Objective of ERP: Enhancing the customer relationship management (CRM) is a main feature coming under the core objectives of ERP. It increases the quality of services, shortens delivery times and enhances the performance rate offered by companies.

Core objective behind ERP implementation in an organization is listed below:

- Error controlling
- Integration of real-time information
- For better planning as well as management of resources according to the needs
- Better work flow, upgrading the required software modules and improved efficiency.

2.2 Scope of Work:

Procurement and Implementation of ERP, Billing Software and IT/OT enablement works by appointing System Integrator (SI) under RDSS.

3. Technical Justification of the ERP, Billing Software and IT/OT enablement Works:-

3.1 Distribution is the most critical segment of the electricity business chain. The real challenge in the power sector today lies in efficient management of the distribution sector. Availability of a robust sub transmission and distribution network is the need of the day for efficient management of the distribution system.

Electricity is the key ingredient for accelerated economic growth and is considered vital for nation's overall development.

Providing reliable and quality power supply in an efficient manner is an immediate requirement of the day. Amongst the three major layers of Power Sector i.e. Generation, Transmission and Distribution, the Distribution Sector has direct interface with the end consumers and is largely accountable for consumer satisfaction and also for flow of revenues in the entire value chain of Power Sector. Thus, Distribution Sector plays a significant role in sustenance as well as growth of the Power Sector.

There is a consistent increase in electricity demand, particularly in urban areas, due to increase in customer base, changes in lifestyle and consumption pattern, which requires continual up-gradation and creation of infrastructure for electricity distribution. However, the poor financial health of the distribution utilities has resulted in inadequate investment in the distribution network.

3.2 The Government of India has been providing support to State owned Discoms by extending financial assistance through various programs. However, critical gaps/missing links in the sub transmission and distribution network still exist. The sub-transmission and distribution network has therefore become a bottleneck in ensuring reliable and quality power supply to the consumers.

Keeping in view the present financial condition of Discoms, GoI has launched the Revamped Distribution Sector Scheme (RDSS) to extend financial assistance against capital expenditure to address the gaps in sub transmission & distribution network and metering in urban areas to supplement the resources of DISCOMs. IT enablement of distribution sector including ERP implementation forms an important part of the project to achieve above objectives.Power Finance Corporation (PFC), Nodal Agency for RDSS, issued approved guidelines dated 20-07-2021 on Project formulation for IT/OT enablement works, SCADA and DMS under the Indicative list of Part-A under RDSS.

3.3 As per RDSS guidelines, expenditure shall be incurred on implementation of ERP, Billing Software, IT/OT enablement Works and MDM in Mumbai Zone (in BEST supply area). Accordingly, DPR is prepared and primarily put up for sanction to Government of Maharashtra (GoM) and after approval of GoM, the DPR submitted to the RDSS Monitoring Committee of MoP / GoI which is sanctioned by the Committee vide PFC Letter No. 02 : 10 : RDSS:2021:I:BEST dated 21st, November, 2022 (Grant No. 21982001) under RDSS. PFC approved schemes consist of ERP, Billing software, IT/OT enablement works. As per Guidelines, IT enablement including ERP Implementation will enable improvement in consumer satisfaction and power supply reliability and ultimate reduction of AT&C losses with proper Energy Accounting and Auditing.

4. Cost Sheet of ERP, Billing Software and IT/OT enablement works

Table 86: Cost Sheet of ERP, Billing Software & IT/OT

SR. NO.	PARTICULARS	UNIT	QTY	TOTAL COST
1	Part IT System Implementation Phase Cost	No.	1	1620497863
2	IT System - ATS Cost (For 2 Years)	No.	1	264616611
3	Cloud Service Provider (CSP) Cost (For 2 Years)	No.	1	81458728
4	FMS services Cost (for 2 years)	No.	1	281185464
5	Operations & Maintenance (O&M) Services Cost (For 2 Years)	No.	**1**	111566112
7	PMA Charges			9970117.97
	GRAND TOTAL		**-**	**2369294895.97**

5. Cost Benefit Analysis (CBA):

Though there is no direct tangible cost benefit, however, Implementation of ERP, Billing Software, IT/OT Enablement work and MDM envisaged under RDSS scheme will help BEST to achieve the objective of increasing productivity of its Human Resources. Also, the proposed new solution will give the following benefits:

1) Strengthen the availability and responsiveness of existing online applications by having appropriate hardware & software resources and its integration.

2) Strengthen agility, scalability, multi-tenancy, governance of its IT applications and maintain these for a foreseeable future.

3) Utilization of the modern technologies such as Cloud Computing consisting of Compute, Storage and software to improve the scalability, availability, maintainability & performance of IT based systems.

The Government of India's RDSS Scheme has mandated BEST to take serious efforts to enhance its service delivery particularly through online mode for its employees and more than 10 Lakh consumer base in the Mumbai City.

6. Phasing of capital expenditure and Capitalisation:

Table 87: Schedule of Capitalisation of ERP, Billing Software and IT/OT

Particulars	Total	Phasing of Capital Expenditure		
		23-24	24-25	25-26
Total CAPEX with PMA	235.93	31.03	167.96	36.94
Total Capitalization with PMA	235.93	31.03	167.96	36.94
PFC Approved CAPEX	75.98	11.01	53.11	11.86
PFC Approved Capitalization	75.98	11.01	53.11	11.86
Approved PMA Charges	1.14	0.17	0.79	0.18
60% Grant on PMA Charges	0.68	0.10	0.47	0.11
60% Grant on CAPEX	45.59	6.61	31.87	7.11
Total Grant with PMA	**46.27**	**6.71**	**32.34**	**7.22**

APPENDIX-5:

1. Part1: Particulars of ERP, Billing Software& IT/OT enablement work furnished in the over view of the DPR

Part1: Particulars of ERP, Billing Software& IT/OT furnished in the over view of the DPR	
1.1.	**Name of Applicant**: BEST (Brihanmumbai Electric Supply & Transport undertaking)
1.2.	**Name of the Capital Investment Work**: ERP, Billing Software and IT/OT enabled works and Meter Data Management (MDM).
1.3.	**Nature of CAPEX Scheme (New/ Resubmitted / revised / modified /extended)**:New
1.4.	**Details of the Location**: Mumbai circle (BEST's Licensee Area), Head quarter Coordination lat 18.9216780548024, long 72.8300250353453
1.5	**Date of Approval by Competent Authority designated by the Board of Directors of the Company**: *A copy of management approval for RDSS Scheme including "Implementation of Infrastructure works under Loss Reduction" is enclosed as* ***Annexure-E.***
1.6	**Category of DPR**: This DPR Scheme falls under Regulation 3.9 of MERC (Approval of Capital Investment Schemes) Regulations, 2022, 3.9 (e) Capital Nature Schemes funded partially by Central or State Government Grants; (o) Improvement in consumer services
1.7	Objective of the Capital Investment: (i) Distribution is the most critical segment of the electricity business chain. The real challenge in the power sector today lies in efficient management of the distribution sector. Availability of a robust sub transmission and distribution network is the need of the day for efficient management of the distribution system. Electricity is the key ingredient for accelerated economic growth and is considered vital for nation's overall development. Providing reliable and quality power supply in an efficient manner is an immediate requirement of the day. Amongst the three major layers of Power Sector i.e. Generation, Transmission and Distribution, the Distribution Sector has direct interface with the end consumers and is largely accountable for consumer satisfaction and also for flow of revenues in the entire value chain of Power Sector. Thus, Distribution Sector plays a significant role in sustenance as well as growth of the Power Sector. There is a consistent increase in electricity demand, particularly in urban areas, due to increase in customer base, changes in lifestyle and consumption pattern, which requires continual up-gradation and creation of infrastructure for electricity distribution. However, the poor financial health of the distribution utilities has resulted in inadequate investment in the distribution network.

	(ii) The Government of India has been providing support to State owned Discoms by extending financial assistance through various programs. However, critical gaps/missing links in the sub transmission and distribution network still exist. The sub-transmission and distribution network has therefore become a bottleneck in ensuring reliable and quality power supply to the consumers. (iii) Keeping in view the present financial condition of Discoms, GoI has launched the Revamped Distribution Sector Scheme (RDSS) to extend financial assistance against capital expenditure to address the gaps in sub transmission & distribution network and metering in urban areas to supplement the resources of DISCOMs. IT enablement of distribution sector including ERP implementation forms an important part of the project to achieve above objectives. Power Finance Corporation (PFC), Nodal Agency for RDSS, issued approved guidelines dated 20-07-2021 on Project formulation for IT/OT enablement works, SCADA and DMS under the Indicative list of Part-A under RDSS. As per RDSS guidelines, expenditure shall be incurred on implementation of ERP, Billing Software, IT/OT enablement Works and MDM in Mumbai Zone (in BEST supply area). Accordingly, DPR is prepared and primarily put up for sanction to Government of Maharashtra (GoM) and after approval of GoM, the DPR submitted to the RDSS Monitoring Committee of MoP / GoI which is sanctioned by the Committee vide PFC Letter No. 02 : 10 : RDSS:2021:I:BEST dated 21st, November, 2022 (Grant No. 21982001) under RDSS. PFC approved schemes consist of ERP, Billing software, IT/OT enablement works and MDM. As per Guidelines, IT enablement including ERP Implementation will enable improvement in consumer satisfaction and power supply reliability and ultimate reduction of AT&C losses with proper Energy Accounting and Auditing.
1.8	**Need of Analysis**: GoI has launched RDSS to reduce AT&C losses to Pan-India levels of 12-15% by 2024-25 and data is required for the same. To improve consumer services GoI has approved the schemes of ERP. Billing Software, IT/OT Enablement Work and MDM.
1.9	**List of Identical schemes previously approved by the Commission and their progress report (5 years data):** First time BEST is implementing the Schemes for Loss Reduction under RDSS. Hence, no previous records of such schemes.
1.10	**State Map showing Location of the Scheme (for Transmission)**- Not Applicable

1.11.	**Brief scope and specification of work**: **1 <u>ERP System-Utility Solution</u>** 1a. Metering, Billing, and Collection (MBC) System - Core electrical utility solutions 1b. Meter Management 1c. Billing System Revenue Management 1d. Customer Services (New Service Connection & Disconnection)/Customer Relationship Management (CRM) including call center application 1e. Integration with GIS 1f Integration with MDM 1f. Integration with ADMS and SCADA 1g. Integration with e-mail, SMS and WhatsApp Messaging services 1h. Integration with Payment Gateway **2 <u>ERP System- Core Module</u>** 2a. Finance and Accounting Management 2b. Material, management 2c. Human Resource Management (including Payroll and employee self-service) 2d. Asset Maintenance Management (including work permit system) 2e. Project Management/Project Execution and Budgeting 2f Sales Management (Scrap Sales process) 2g. Business Reporting **3 <u>ERP System- Other Functions</u>** 3a. Data Management and Business Analytics Solution 3b. Unified Consumer Self Service Portal with chatbot and mobile adoptable 3c. Unified Employee Self Service Portal with chatbot and mobile adoptable 3d Project training 3e. Training for BEST Technical/Functional/Core Users/Power users/Business Users / Customers / Vendors as desired. 4. <u>MDMS</u> 4a. A Central Meter Data Management System (CMDMS). ***For copy of Specifications of ERP, Software Billing & IT/OT items, kindly refer Annexure-AT.***
1.12.	**Any Reference of Study Report / recommendation of OEM/Expert:** N.A for this DPR.
1.13.	**Estimated Cost**: Rs.235.93 Cr. (FY 2023-24–31.03, FY 2024-25–167.96 Cr. and FY 2025-26- 36.94 Cr.). IDC is not considered. ***ForCost Sheet, kindly refer Annexure-AU.***
1.14.	**Time Frame of the expenditure:** Project completion Period 36 months. Table 88:Time Frame of Capex

Financial Year	Capex Expenditure (in Rs.)	Capitalisation (in Rs.)
2023-24	31,02,60,021.30	31,02,60,021.30
2024-25	167,96,51,299.20	167,96,51,299.20
2025-26	36,94,13,457.50	36,94,13,457.50
TOTAL	**235,93,24,778.00**	**235,93,24,778.00**

1.15. Funding arrangement: For FY2023-24toFY 2031-32 (for 9 years from the date of contract).

Table 89: Funding arrangement

Sources of Funds	Amount (in Crs.)	Share (%)
Debt (30% of balance cost)	170.69	72
Equity (10% of balance cost)	18.97	8
Grant (60% of approved cost)+PMA	**46.27**	20
Consumer Contribution/Deposit Works	-	-
Total	**235.93**	**100**

Please kindly note that PFC approved cost of RSS project is Rs. 75.98 Cr. and Grand of Rs. 45.59 Cr. Shall be made available from GoI for this project which is 60% of approved cost. Also, PMA approved cost for IT/OT is Rs.1.14 Cr. So, total Grant amount will be Rs. 46.27 Cr.

1.16 Benefits/Impact on RSS Schemes:

Though there is no direct tangible cost benefit, however, Implementation of ERP, Billing Software, IT/OT Enablement work and MDM envisaged under RDSS scheme will help BEST to achieve the objective of increasing productivity of its Human Resources. Also, the proposed new solution will give the following benefits:

(i) Strengthen the availability and responsiveness of existing online applications by having appropriate hardware & software resources.

(ii) Strengthen agility, scalability, multi-tenancy, governance of its IT applications and maintain these for a foreseeable future.

(iii) Utilization of the modern technologies such as Cloud Computing consisting of Compute, Storage and software to improve the scalability, availability, maintainability & performance of IT based systems.

The Government of India's RDSS Scheme has mandated BEST to take serious efforts to enhance its service delivery particularly through online mode for its employees and more than 10 Lakh consumer base in the Mumbai City.

Impact on tariff by considering 60% Grant on approved cost and without Grant is given below:

Table 90 : Impact on Tariff with & without GBS (Grant)

F .Y.	23-24	24-25	25-26	26-27	27-28	28-29
With Grant	0.0049	0.0349	0.0641	0.0664	0.0633	0.0604
Without Grant	0.0062	0.0436	0.0796	0.0825	0.0786	0.0750

Tariff impact with Grant and without Grant is worked out and same is shown in the above table. ***A copy of Tariff Impact with grant and without Grant, kindly refers Annexure-AV and AW respectively***.

1.17. Overall Cost-benefit Analysis:

Due to implementation of this scheme, there is no direct tangible cost benefit; however, implementation of ERP, Billing Software& IT/OT Enablement work envisaged under RDSS scheme will help BEST to achieve the objective of increasing productivity of its Human Resources and improves consumer services.

2. PART-II: Particulars of ERP, Billing Software & IT/OT furnished for justification of works

2.1	**Need of the investment**: The Government of India's initiatives like 'Make in India' and 'Smart Cities' are to achieve an efficient, reliable and continuous power supply. India's power sector in the present day is facing a lot of problems like high AT & C losses, inefficient distribution and transmission system because of age old infrastructure and power theft. The advanced energy management and increased use of renewable energy resources are the foremost areas being concentrated by the government for the development of country. The government has taken initiatives for (i) complete revamping of power sectors electrical equipment across the country and (ii) for the need of changing the way of operation and control of the electrical equipment. Accordingly,, Govt. of India has launchedthe Revamped Distribution Sector Scheme (RDSS) to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. The Scheme would be available till the year 2025-26. REC and PFC have been nominated as nodal agencies for facilitating implementation of the Scheme. Accordingly, Power Ministry of Govt. of India has issued guidelines for implementation of RDSS **Objective of the scheme:** Implementation of ERP, Billing Software and IT/OT Enablement work envisaged under RDSS scheme will help BEST to achieve the objective of increasing productivity of its Human Resources and improves consumer services.
2.2	**Time lines of the Project:** 1. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.1), project approval date was 31.03.2023. As per guidelines BEST had prepared Action Plan and DPR for FY 2023-24, FY2024-25 & FY2025-26 by considering the audited annual accounts for FY 2019-20 & FY2020-21 and submitted to the Executive Director (IPDS), PFC on 22.08.2022.

	2. As per RDSS Guidelines (Chapter 4, Para 4.7, Sub-Para 4.7.2), the last date for completion of this scheme will be 31.03.2026. The works executed beyond this time lime will not be eligible for getting grant of GoI. ***For timeline of the project, kindly refer Annexure-C, Pg. No.16-17.***
2.3	**Scheme for revised approval/scope/cost**: New Capex Scheme.
2.4	**Proposed Capital Investment Scheme**: Implementation of ERP, Billing Software and IT/OT enabled works by appointing implementing agency.
2.5	**Technical Justification**: 1. Govt. of India has launchedthe RDSS to help DISCOMS to improve operational efficiencies and financial sustainability, by providing result-linked financial assistance to DISCOMs for strengthening of supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks. The main Objectives Scheme is to reduce AT&C losses to pan-India levels of 12-15% by 2024-25, to reduce ACS-ARR gap to zero by 2024-25, to develop Institutional Capabilities for Modern DISCOMs and for improvement in the quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient Distribution Sector. 2. **MYT Regulation:** As per Clause No. 74.1 of MYT Regulation 2019, BEST has submitted DPR for strengthening and augmentation of its distribution network meeting the requirement of load growth, reduction in distribution losses, improvement in quality of supply, reliability, reduction in congestion, etc. 3. As per Capex Regulation, 2022 Clause, 3.9 (e) Capital Nature funded schemes partially by Central Government of India. (o) Improvement in consumer services. 4. The Immediate & Long term benefits will be achieved as follows. **Immediate Objectives:** Improved consumer services as well as internal services **Long Term Objectives :** Improved HR allocation services
2.6	**Financial Justification:** 1. As per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilize internal funds for executing all its Capital Expenditure plans. But due to financial crunch for in house schemed Best has decided to utilize 30% equity from internal sources and balance debt portion of 70% will be borrowed from financial institutions such as REC, PFC, Banks, etc.

	2. In RDSS Project, for infrastructure works, GoI has sanctioned 60% Grant against sanctioned DPR Cost. For ERP, Billing Software and IT/OT enablement works, GoI has approved Rs.75.98 Cr Grant. Further to this, Rs. 0.68 Cr. Amount is sanctioned for PMA and Grant against this PMA cost will be Rs. 0.41 Cr. So, total Grant available for RSS project will be Rs. 46. Cr. 3. For execution of ERP, Software Billing, IT/OT Enablement work and MDM project actual cost arrived by tendering process is Rs.257.86 Cr (including PMA charges). Out of which Rs.46.00 Cr (including PMA Grant) will be the grant amount and balance amount of Rs. 211.86 Cr will be borne by BEST. Out of Rs.211.86 Cr, equity amount will be 10% i.e. Rs 21.19 Cr. and balance 90% amount of Rs. 190.67 Cr. Will be made through debt. 4. BEST has applied to PFC for loan amount for execution of RDSS.
2.7	**Consent of M-DNAC**: As per Electricity Act, 2003, Clause, 42(3), BEST undertaking being a local authority, hence exempted from open Access.
2.8	**Plan of other Transmission Licensees / CTU**: DPR is related to Distribution Licensees, hence Not Applicable.
2.9	**Phasing of Investment** : Table 91: Phasing of Investment
2.10	**Statutory/Safety Requirement: N.A**

Table 91: Phasing of Investment

Financial Year	Capex Expenditure (in Rs. Crore)	Capitalisation (in Rs. Crore)
2023-24	37.36	37.36
2024-25	180.26	180.26
2025-26	40.24	40.24
TOTAL	**257.86**	**257.86**

2.11 **Cost Assessment /Cost Break-up**:

Table 92: Cost Break-up

SR. NO.	PARTICULARS	UNIT	QTY	TOTAL COST
1	Part IT System Implementation Phase Cost	No.	1	1620497863
2	IT System - ATS Cost (For 2 Years)	No.	1	264616611
3	Cloud Service Provider (CSP) Cost (For 2 Years)	No.	1	81458727
4	FMS services Cost (for 2 years)	No.	1	281185473
5	Operations & Maintenance (O&M) Services Cost (For 2 Years)	No.	**1**	111566101
7	PMA Charges			9970117.97
	GRAND TOTAL		**-**	**2369294895.97**

As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022, BEST was invited and finalised tender to appoint "Project Implementation Agency" with a transparent, competitive, fair and reasonable procedure. Subsequently, ***a copy of a Letter of Award (LoA) has been issued to M/s*** **Infinite Computer Solution India Ltd. (for ERP, Software Billing & IT/OT Enablement Works)** ***which is enclosed as Annexure-H, 37-53 of 68.***

2.12 **Least Cost analysis /Alternatives**:

A) System Integrator (SI) for Supply, Installation, Commissioning, Implementation and Support for IT Applications and Infrastructure

Letter of Award (LoA) regarding the above has been issued to M/s Infinite Computer Solution India Ltd.

1. As per Apendix-3 (Guidelines for Procurement of material) of MERC (Approval of Capital Investment Schemes) Regulations, 2022 BEST has invited and finalized the tender with a transparent, competitive, fair and reasonable procedure.
2. Accordingly, the unit cost is derived from the open tender invited by advertising and following up the procure mentioned in Apendix-3. The order was placed on the technical suitable and LAO.
3. A tender was opened through open bidding process on Maha e-tender Portal. BEST undertaking advertised the tender in the local as well as all over India media. Initially, Notice of Inviting Tender was advertised for "System Integrator (SI) for Supply, Installation, Commissioning, Implementation and Support for IT Applications and Infrastructure for BEST under RDSS"

	4. Details of offers received: Techno-commercial bid opened on 24.05.2023 and price bid opened on 26.05.2023in which Single bidder was quoted for said work. Details of offer received are given in the following table. Table 93: IT/OT Tender Comparative Statement (see table below) ***Accordingly, A Letter of Award (LoA) has been issued to the firm M/s.* Infinite Computer Solution India Ltd.*and copy of the same is enclosed as Annexure-H, Pg. No. 37-53. For details of tendering of ERP, Software Billing & IT/OT, kindly refer Annexure-E, Pg. No. Pg. No. 43-44 of 78.***
2.13	**If not and if Deferred Analysis**: N A.
2.14	**Overall Cost-benefit Analysis**: Though there is no direct tangible cost benefit, however, Implementation of ERP, Billing Software and IT/OT Enablement work envisaged under RDSS scheme will help BEST to achieve the objective of increasing productivity of its Human Resources. Also, the proposed new solution will give the following benefits: 1. Strengthen the availability and responsiveness of existing online applications by having appropriate hardware & software resources. 2. Strengthen agility, scalability, multi-tenancy, governance of its IT applications and maintain these for a foreseeable future. 3. Utilization of the modern technologies such as Cloud Computing consisting of Compute, Storage and software to improve the scalability, availability, maintainability & performance of IT based systems. The Government of India's RDSS Scheme has mandated BEST to take serious efforts to enhance its service delivery particularly through online mode for its employees and more than 10 Lakh consumer base in the Mumbai City.
2.15	**Methodology of Put to use of the asset and computing Percentage utilization of Project**: During the Financial Year (April to March), when the capital Expenditure made on execution of particular scheme and when this asset is "PUT TO USE" then only considered for capitalization purpose. Otherwise the said asset will be shown as WIP and IDC will be made applicable to this Scheme.
2.16	**Constraints:** No major constraint is anticipated at this stage.

Table 93 (within 2.12, item 4):

Tr. No.	Name of the Tenderer	Total contractual Value (₹)	Ranking
1	Infinite Computer Solution India Ltd.	235,93,24,774.13	1 (Only Offer)

2.17	**Inclusion in STU Plan/License for Transmission Projects. Recommendation of the Transmission Planning Committee as provided in the Grid Code:** N.A
2.18	**Works intended for adaptation of latest** **Technology/Improvement/Up gradation of Existing Infrastructure:** As per MERC (Electricity Supply Code and Standards of Performance of Distribution Licensees including Power Quality) Regulation. 2021, Electricity (Rights of Consumers) Rules, 2020 and MoP Notification, it is made mandatory that all the new connections shall be released with the Smart Meter or Meter having at least the facility of remote reading: further to that all the existing meters shall be replaced only by prepaid Smart Meter or Meter having at least the facility of remote reading. For the same separate DPR is already prepared and submitted to the Hon'ble Commission for their in-principle clearance. Accordingly, to implement above said regulations, BEST has prepared this Detailed Project Report (DPR) to release new connections with smart meters and also to replace all existing meters with smart meters for all consumers, along with setting up the backbone communications infrastructure and related IT systems. The communication backbone facilitates the acquisition of data from smart meters and brings it to central server. The IT/OT software installed in the server takes care of the huge data collected from the field. This data is then shared with other applications like billing, GIS, SCADA etc. and generated reports. Looking at the consumer base of more than 10 lakhs, BEST has planned to replace existing meters with smart meters and have an ERP, Billing Software and IT/OT enabled system.
2.19	**Upstream/Downstream arrangement:** N. A
2.20	**Statistory Clearances and Project Layout:**Not required for this scheme.
2.21	**Detailed Survey**: For execution of the scheme detail survey is being carried out by Implementing Agency.
2.22	**Past Trend and Future projection**: The old system was created as per the internal need as required and possible. **Future projection**: This system will take care of near future also. If there is need to up-grade the system, same will be up-graded as per system need.
2.23	**Detailed Justification for quantity proposed:** The system has been planned to cover the consumer base of existing more than 10 Lakh meters and future addition in next 5 years.

2.24	**Check list of the documents appended:** 1. DPR in the MERC Format for FY2023-24 to FY2025-26 2. Pat-I and Part-II Filled Formats of Capital Investment Scheme for MERC Approval 3. Annexure-C: - Guidelines of RDSS Scheme 4. Annexure-D: -BEST's submission Letter &PFC approval copy 5. Annexure-E:- A copy of Management Approval for RDSS (BCR) 6. Annexure-H:-LoA of contract M/s Infinite Computers Solution India Ltd. 7. Annexure-AU: - Cost Sheet 8. Annexure-AT :-Specifications of ERP, Software Billing & IT/OT 9. Annexure-AV: -Tariff Impact with Grant 10. Annexure - AW:- Tariff Impact without Grant

4.13 Total Cost sheet of RDSS (Loss Reduction)-Combined Cost Sheet

A) Table 94: Total cost without GBS (Grant)

SECT -ION	Name of Scheme	Cost in Cr.	FY 2023-24	FY 2024-25	FY 2025-26
			Cost (in Cr.)	Cost (in Cr.)	Cost (in Cr.)
1	Infrastructure Works Related to Receiving Substations (RSS)	5049070964.70	1221917346.35	2153429110.88	1673724507.47
2	Infrastructure Works Related to Distribution Substations (DSS)	6909325649.00	1604360243.21	2652214339.53	2652751066.26
3	Auxiliary components for Consumer metering.	820449835.84	246127630.37	287153947.40	287168258.07
4	Implementation of ADMS	1821500255.70	873683719.23	536477920.17	411338616.30
5	Implementation of ERP, Billing Software, &IT/OT	2359324778.00	310260021.30	1679651299.20	369413457.50
6	PMA Charges	152361600.00	42376335.47	59814310.63	50170953.90
	GRAND TOTAL	**17112033083.24**	**4298725295.93**	**7368740927.81**	**5444566859.50**

B) Table 95: Total cost with GBS (Grant)

SECT -ION	Name of Scheme	Cost in Cr.	FY 2023-24	FY 2024-25	FY 2025-26
			Cost (in Cr.)	Cost (in Cr.)	Cost (in Cr.)
1	Infrastructure Works Related to Receiving Substations (RSS)	5049070964.70	1221917346.35	2153429110.88	1673724507.47
2	Infrastructure Works Related to Distribution Substations (DSS)	6909325649.00	1604360243.21	2652214339.53	2652751066.26
3	Auxiliary components for Consumer metering.	820449835.84	246127630.37	287153947.40	287168258.07
4	Implementation of ADMS	1821500255.70	873683719.23	536477920.17	411338616.30
5	Implementation of ERP, Billing Software, and IT/OT	2359324778.00	310260021.30	1679651299.20	369413457.50
6	PMA Charges	152361600.00	42376335.47	59814310.63	50170953.90
7	**TOTAL**	**17112033083.24**	**4298725295.93**	**7368740927.81**	**5444566859.50**
8	TOTAL GBS (Grant) including PMA Grant	5939700000.00	1535413495.88	2536254690.19	1868031813.93
9	**TOTAL Amount After Grant (7-8)**	11172333083.24	2763311800.05	4832486237.62	3576535045.57
10	**TOTAL AMOUNT IN CR.**	**1117.23**	**276.33**	**483.25**	**357.65**

4.14 Cost Benefit Analysis (CBA) of RDSS:

Cost Benefit Analysis (CBA0 is in line with latest MTR Order 212 of 2022 dated 31.03.2023. Now, the Cost of total DPR is revised due to due to revision in RI Charges, Revision in cost of ADMS and deletion of MDM part from the DPR.

The benefits of the capital expenditure proposed to be incurred under the RDSS may be divided into two parts; namely- Tangible benefits and Intangible benefits.

The capital expenses basically made for Implementation of following RDSS projects does not directly contribute to increase sale of power. However, these expenses too are necessary for reliable supply of power in the long run and hence have been included in the cost benefit analysis (CBA).

i. Auxiliary components for Smart Metering Project
ii. ADMS and
iii. ERP, Software billing & IT/OT enablement works

The benefit of the augmentation will accrue for the entire life of the equipment installed; they have been projected for a period of five years only.

1. **Benefits of Auxiliary Components for Smart Metering**: Replacement of existing meter boards with refurbished Meter Boards of various sizes with facility of installation of Single / Three Phase Meter, Wire and 40/63/100 Amps MCB would help in installation of Smart Meters in BEST resulting following benefits/objectives:

- By connecting new meters to release new load will increase revenue.
- Availability of information and online services.
- Improved Billing and Billing Accuracy.
- Improved billing Accuracy.
- Higher reliability of the system.
- Elimination of manual meter reading
- Outage Management and real time data.
- Remotely Connect and Disconnection of meters

2. **Benefits of ADMS:**

After installation & commissioning of ADMS, BEST will be able to achieve the Following Benefits:

Real time monitoring: All electrical parameters like voltage, current, power factor, power transformer tap and loading etc. of the RSS, Strategic DSS are monitored on real time basis.

On-line control: The switchgears are operated on-line for switching and load transfers. The power factor of the DSS/RSS is monitored by on-line operation of the Capacitors. OLTCs are operated / monitored on-line to regulate the voltage profile.

Archiving of data: All above electrical parameters are archived at 10 to 15 min. interval. Report generation of archived data is utilized for various purposes like DMS, load forecasting, preparation of Equipment Maintenance Schedules of RSS/DSS, etc.

Reduction of Skilled manpower at RSS: After implementation of ADMS in BEST, all the operations at RSS/DSS are to be carried out from the MCC, BCC remotely. Subsequently, the requirement of manning RSS by skilled officer at every 33/22 kV RSS will be reduced resulting saving cost on manpower. However, the proposed skilled manpower at 110kV RSS will be remain unchanged by considering the importance and voltage level of RSS.

Reduction in fault isolation time and restoration time and average interruption time will be reduced.

Other benefits are as follows:

- Better quality of supply.
- Reduction in revenue loss.
- Efforts in travelling of Fault Engineer & its crew are minimized.
- Load forecasting & useful for future network system design.
- Increase in life of electrical equipments.
- Safety of operation staff enhances.
- Useful in Disastrous conditions like flooding, earthquake, etc
- Useful in festivals like Ganesh Utsav, Diwali, etc.
- System generated SOP parameters

3. **Benefits of ERP, Billing Software and IT/OT enablement works**

Though there is no direct tangible cost benefit, however, Implementation of ERP, Billing Software and IT/OT Enablement work envisaged under RDSS scheme will help BEST to achieve the objective of increasing productivity of its Human Resources. It also, gives following benefits:

- Strengthen the availability and responsiveness of existing online applications by having appropriate hardware & software resources and its integration.
- Strengthen agility, scalability, multi-tenancy, governance of its IT applications and maintain these for a foreseeable future.
- Utilization of the modern technologies such as Cloud Computing consisting of Compute, Storage and software to improve the scalability, availability, maintainability & performance of IT based systems.

4. Benefits due to replacement of age old switchgears (RSS &DSS), RMUs (DSS):-

Tangible benefits can be achieved by replacement of age old equipments such as 33 kV and 11 kV (350MVA) switchgears, 11 kV Oil Type Switchgears (250 MVA) / RMUs, etc. Due to reduction in off supply period, considerable amount of cost will be saved. Further to this, it will improve reliability and quality of power supply.

5. Tangible Benefits due to replacement of old Power Transformers with New Power Transformers:

Under RDSS, total 18 Nos. of T/Fs are proposed to be replaced. Existing old T/Fs were procured with total 63 kW (NLL- 9 kW & TL - 63 kW) losses. However, these losses are now reduced to 52.50 kW (NLL- 8.5 kW & TL – 52.50 kW) from 63 kW, because of which there is net saving of 10.50 kW. Yearly about 26,83,843.20 units will be saved costing of ₹ 2.10 Cr. ***For detail calculation, kindly refer Annexure-O.***

Please note that due to ageing losses of the T/Fs are increased. Current losses of T/Fs are more than 15% of initial losses (Losses at the time of installation). While calculating the losses, existing losses due to ageing are not considered.

6. Tangible Benefits due to replacement of age old 33 kV, 11 kV and 1.1 kV cables:

Please note that existing PILC/XLPE cables are more than 30 years old & having number of joints resulting increase in **I^2R loss**. It is estimated that about ₹ **36.07 Cr** (33 kV cable, 100.14 kM, ₹ 1.60 Cr, 11 kV cable, 203.09 kM, ₹29.96 Cr & 1.1 kV cable, 50.05 kM, ₹4.51 Cr) cost will be saved against up-gradation HV & LV cables under RDSS. ***For detail calculation, kindly refer Annexure-P.***

7. Tangible Benefits due to replacement of age old DTs (666 Nos.):

7.1 We have tested 2 Nos. of DTs of same rating i.e. 630 kVA; it is found that losses of DTs are increased by 39% to 40% of the losses at the time of purchase. For loss estimation purpose, it is assumed that 39% losses of each DT are increased as against the total losses at the time of purchase. ***For details, kindly refer Annexure-Q, Pg. No.2.***

7.2 Please note that existing Dry Type and ONAN Type DTs are more than 30 years old. It is estimated that about ₹ 23.21 Cr (ONAN Type DT -₹21.94 Cr & Dry Type DT - ₹1.27 Cr) cost will be saved against up-gradation/replacement of 666 Nos. of DTs under RDSS. ***For detail calculation, kindly refer Annexure-Q, Pg. No.3/C to 4/C.***

7.3 Due to replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA and upgrading the voltage level from 22 kV to 33 kV, there will be substantial reduction in distribution losses. ***Refer Annexure-Q, Pg. No.1.***

8. Revenue due to additional sales

RSS Capacity Addition

i. Additional T/Fs = 2X16 MVA
ii. Replacement 11X10 MVA to 11X16 MVA = 66 MVA Addition
iii. Replacement 6X15 MVA to 6X16 MVA = 6 MVA

DSS Capacity Addition

Replacement 3X1000 kVA to 3X1600 kVA = 1.8 MVA Addition

Table 96: Table MVA Capacity addition

Sr. No.	Particulars	Units	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27
1	Capacity added	MVA	16.60	70.60	18.60	-
2	Average P. Factor	--	0.9900	0.9900	0.9900	0.9900
3	RoE/ unit	Rs./Unit	0.3013	0.2961	0.2961	0.2961

Calculations of RoE for FY 2023-24 (Case No.212 of 2022 dtd.31.03.2023)

RoEfor FY2023-24= Rs.143.82 Cr) Refer ---Annexure-R, Pg No.7/C
Distribution Loss = 4.18% ---- Annexure-R Pg No.4/C

Energy sale = 4772.81 Mus. --- Annexure-R Page No.4/C

R0E per unit = $143.82 \times 10^7 / 4772.81 \times 10^6 = 0.3013$

Calculations of RoE for FY 2024-25 (Case No.212 of 2022 dtd.31.03.2023)

ROE for FY24-25= Rs.148.72 Cr) Refer --- Annexure-R, Pg. No. 7/C.

Distribution Loss = 4.18% --- Annexure-R Page No. 4/C

Energy sale = 5023.20 Mus. --- Annexure-R Page No. 4/C

R0E per unit = $148.72 \times 10^7 / 5023.20 \times 10^6 = 0.2961$

For calculation of RoE per unit, the values of RoE, Distribution Loss, and Energy Sales are taken from ***MERC Order Case No. Case No.212 of 2022 dtd.31.03.2023 and same is enclosed as Annexure –R.***

Projections for the additional revenue accrued due to potential additional sales for a period of Five Years is given below:

Table-97 Calculation of revenue from additional sales

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Capacity Addition (MVA)	16.60	70.60	18.60	-	-
Cumulative capacity Added (MVA)	16.60	87.20	105.80	105.80	105.80
Incremental loading	20%	30%	40%	50%	60.04%
Distribution losses	4.18%	4.18 %	4.18 %	4.18 %	4.18 %
System power factor	0.9900	0.9900	0.9900	0.9900	0.9900
Additional sales (MU)	27.59	158.72	262.09	350.01	437.99
RoE per Unit (Rs/ unit)	0.3013	0.2961	0.2961	0.2961	0.2961
Total revenue (₹ in Cr)	**0.83**	**4.70**	**7.76**	**10.36**	**12.97**

For estimation of additional MUs saleable, only incremental loading of the RSS has been considered. It is assumed that in the first year of commissioning, a new transformer shall be loaded to the extent of 20%, in the 2nd year at 30%, in the third year at 40%, in the 4th year at 50% and finally in the fifth year at 60.04% or equivalent to the average load factor of the system. The load factors for each year shown in the table above are the weighted average of the transformer capacity and their incremental loading for that year.

A sample calculation for estimating the additional units sold is given below:

No. of units realized in FY 2023-24

= Load * Power Factor * Incremental load * No. of hours per day * No. of days * (1- Distr. Loss) / 10^6

= 16.60 * 0.9900 * 20% * 24 * 365 * 1000 * (1-4.18%)/10^6 = 27.59 MUs

Based on the above calculations the total benefit that can be accrued from the proposed capital expenditure under this scheme is as below:

Table 98: Benefits from RSS project schemes **Amount in Cr.**

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Revenue due to additional sales	0.83	4.70	7.76	10.36	12.97
Revenue realized	0.83	4.70	7.76	10.36	12.97

For Revenue calculation, kindly refer Annexure-AX.

Intangible Benefits

1. The replacement of old age cables help in meeting increasing load in its area of installation and to improve quality and reliability of supply.

2. In addition to above replacement of outlived Switchgears & Transformers with New Switchgears & Transformers, the scheme will enhance the safety and also reduce supply interruptions and thus will generate additional revenues.

Summary of the Benefits /Savings due to up-gradation of Distribution Infrastructure:

Table 99: Summary Sheet **Amount ₹ in Cr.**

Sr. No.	Particulars	FY 23-24	FY 24-25	FY 25-26
1.	Replacement of Power Transformers	2.10	2.10	2.10
2.	Replacement of 33kV, 11 kV & 1.1 kV cables	36.07	36.07	36.07
3.	Augmentation of RSS & DSS	0.83	4.70	7.76
4.	Replacement of age old DTs	23.21	23.21	23.21
	GRAND TOTAL SAVING in Cr.	**62.21**	**66.08**	**69.14**

4.15 Funding Mechanism

1. As per Section 460 II of the Mumbai Municipal Act 1888, BEST has to utilize internal funds for executing all its Capital Expenditure plans. But due to financial crunch for in house schemed Best has decided to utilize 30% equity from internal sources and balance debt portion of 70% will be borrowed from financial institutions such as REC, PFC, Banks, etc.

2. **Details of item wise PFC approved cost, Gross Budgetary Support (GBS), approved PMA Charges and GBS for PMA**:

2.1 For Smart Meters and Infrastructure works, GoI has approved total ₹ 1632.05 Cr (for Smart Meter-₹659.17 Cr and for Infrastructure works- ₹ 972.88 Cr) under In RDSS Project.

2.2 For Smart Meters, GoI has approved ₹ 98.88 Cr as GBS i.e. 15% of approved cost ₹ 659.17 Cr. Accordingly, BEST is eligible for getting ₹ 98.88 Cr as GBS against approved ₹ 659.17 Cr (15% of ₹ 659.17). Further to this, GoI has approved ₹ 2.47 Cr as GBS for PMA i.e. 2.5% of ₹ 98.88 Cr. Accordingly, BEST is eligible for getting ₹1.48 Cr as GBS for PMA (60% of approved PMA charges i.e. ₹2.47 Cr).

2.3 For Infrastructure works, GoI has approved Rs.972.88 Cr and against this GoI has approved ₹ 583.73 Cr as GBS i.e. 60% of approved cost i.e. ₹ 972.88 Cr. Item wise details are given in the following Table.

Table 100: Details of item wise PFC approved Cost, GBS (Amount ₹ in Cr)

Sr. No.	Item Description	Approved Cost	PMA Charges	GBS for PMA Charges	PFC GBS (Grant)
A	**B**	**C**	D	E=D*60 %	F
1	**Smart Meters**	659.17	# 2.47	1.48	98.88
	Infra work				
2	RSS	232.92	3.49	2.10	139.75
3	DSS	447.73	6.72	4.03	268.64
4	Auxiliary Equipments	72.53	1.09	0.65	43.52
5	ADMS	143.72	2.16	1.29	86.23
6	ERP, Billing Software& IT/OT	75.98	1.14	0.69	45.59
	TOTAL COST in Cr.	**1632.05**	**17.07**	**10.24**	**583.73**

3. Please kindly note that PMA charges of Smart Meters i.e. ₹ 1.48 Cr not considered in the Smart Meter DPR. Hence, same is considered under Auxiliary components.

4. For execution of Revamped Distribution Sector Scheme (RDSS), about ₹ 2881.55 Cr is required (for Smart Meters - ₹ 1303.16 Cr. + for

infrastructure works- ₹ 1578.39 cr.). Out of Rs. 98.98 Cr and ₹ 593.97 Cr will GBS against Rs. 1303.16 Cr and ₹ 1578.39 Cr respectively.

5. To avail the loan, BEST has already applied to REC and REC has also shown willingness for the same. REC officials orally informed that REC is ready to sanction 90% of balance amount (excluding GBS) mount and BEST has to bear 10% of balance amount. Details are given in the following table:

Table 101: details of Loan amount

Sr. No.	Item Description	Total Estimated cost in ₹ Cr.	GBS (in ₹ Cr.)	Loan Amount in ₹ Cr. (REC)
A	**B**	**C**	D	E=C-D
1	For infrastructure works of RSS	504.91	139.75	365.16
2	For infrastructure works of DSS	690.92	268.64	422.28
3	Auxiliary Equipments	82.05	43.52	38.53
4	Implementation of ADMS	182.15	86.23	95.92
5	ERP, Billing Software, IT/OT and MDM	235.93	45.59	190.34
6	PMA Charges	15.24	10.24	5.00
	TOTAL COST in Cr.	**1711.20**	**593.97**	**1117.23**

6. BEST has applied to REC for loan amount for execution of RDSS and ***copy of the same is enclosed as Annexure-O.***

4.17 Scrapping of replaced assets: After removing the serviceable parts, all the removed material will be scrapped and the cost recovered after scrapping will be considered at the time of MYT Petition under head '**other income**'. Under replacement, all old material which is above ground level like switchgears, transformers etc. is recovered and same will be scrapped, so there is no any material is going to be abandoned. ***For Scrapping policy, refer Annexure-Y.***

4.18 Tariff on Impact

The Capital Scheme is to be executed in a 5-years period; hence capitalization of the project expenditure would also be attained over a 5-years period. The capitalization of any capital expansion project would reflect as impact on tariff based on the various components approved in the ARR. The components of the ARR like Return on Equity, O&M expenses, Depreciation, Distribution loss and Income tax would be affected due to amount of capitalization of the project scheme.

The above components of ARR would be charged as follows:

- Return:

- BEST claims returns as Return on Equity on the normative equity component as permitted in the Tariff Regulations
- BEST is also eligible for Interest on Internal on the normative debt utilised for Capital Expenditure as per ATE judgement dated 27-08-2007

- O&M expenses (Running Expenses) escalation factor is 4.22% is considered.
- Distribution loss 4.18% is considered.
- Depreciation at 3.53% is considered.
- Interest on debt would be 10.49 %
- Interest on Working capital would be **9.55 %** and No income tax has been considered as BEST being a local authority is exempt from income tax

The capitalisation of project expenses is proposed on the lines of commissioning of the new RSS/DSS equipments, installation of switchgears and laying of cable schemes for various RSS& DSS, Implementation of ADMS, Auxiliary components, and implementation of IT/OT project. The proposed capitalisation amount would be allocated on the basis of phased commissioning/Execution of RDSS as indicated in the following table

Table 102: Schedule of capitalisation without GBS (₹ in Cr)

Particulars	FY 2023-24	FY 2024-25	FY 2025-26	Total
Capital Expenditure	429.87	736.87	544.46	1711.20
Capitalization	429.87	736.87	544.46	1711.20

Table 103: Schedule of capitalisation with GBS (₹ in Cr)

Particulars	FY 2023-24	FY 2024-25	FY 2025-26	Total
Capital Expenditure	276.33	483.25	357.65	1117.23
Capitalization	276.33	483.25	357.65	1117.23

4.18.1 Impact on Tariff without Grant

Table 104: Impact on Tariff without Grant

Scheme Name	Amount (Rs. cr.)	Phasing of Capex (₹ in Cr)					
		23-24	24-25	25-26	26-27	27-28	28-29
Capital Expenditure	1,711.20	429.87	736.87	544.46	-	-	-
IDC		-	-	-	-	-	-
Total capitalisation (incl. IDC)	1711.20	429.87	736.87	544.46	-	-	-
GFA statement							
Opening balance		-	429.87	1166.74	1711.20	1711.20	1711.20
Addition		429.87	736.87	544.46	-	-	-
Closing balance		429.87	1166.74	1711.20	1711.20	1711.20	1711.20

Equity statement							
Opening balance		-	128.96	350.02	513.36	513.36	513.36
Addition		128.96	221.06	163.34	-	-	-
Closing balance		128.96	350.02	513.36	513.36	513.36	513.36
Revenue expenses							
Interest on debt		15.19	55.22	96.07	107.33	99.36	92.90
Return on Equity		9.03	33.53	60.44	71.87	71.87	71.87
Depreciation (3.53%)		7.59	28.18	50.80	60.41	60.41	60.41
Running Expenses (@4.22%		9.07	33.69	60.72	72.21	72.21	72.21
Income Tax (@ 0%		-	-	-	-	-	-
Total (Rs. Cr)		40.87	150.62	268.02	311.82	303.85	297.39
Net Cost (Rs. Cr)		40.87	150.62	268.02	311.82	303.85	297.39
Projected Sales (MU)		4773	5023	5124	5226	5331	5437
Total Impact on tariff (Rs./unit)		**0.0856**	**0.2998**	**0.5231**	**0.5967**	**0.5700**	**0.5469**

4.18.2 Impact on Tariff with Grant

Table 105: Impact on Tariff without Grant

Scheme Name	Amount (Rs. cr.)	Phasing of Capex (₹ in Cr)					
		23-24	**24-25**	**25-26**	**26-27**	**27-28**	**28-29**
Capital Expenditure	1117.23	276.33	483.25	357.65	-	-	-
IDC		-	-	-	-	-	-
Total capitalisation (incl. IDC)	1117.23	276.33	483.25	357.65	-	-	-
GFA statement							
Opening balance		-	276.33	759.58	1117.23	1117.23	1117.23
Addition		276.33	483.25	357.65	-	-	-
Closing balance		276.33	759.58	1117.23	1117.23	1117.23	1117.23
Equity statement							
Opening balance		-	82.90	227.87	335.17	335.17	335.17
Addition		82.90	144.98	107.30	-	-	-
Closing balance		82.90	227.87	335.17	335.17	335.17	335.17
Revenue expenses							
Interest on debt		9.76	35.83	62.67	70.11	64.91	60.71
Return on Equity		5.80	21.75	39.41	46.92	46.92	46.92
Depreciation (3.53%)		4.88	18.28	33.13	39.44	39.44	39.44
Running Expenses (@4.22%		5.83	21.86	39.60	47.15	47.15	47.15
Income Tax		-	-	-	-	-	-
Total (Rs. Cr)		26.27	97.73	174.81	203.62	198.42	194.22
Net Cost (Rs. Cr)		26.27	97.73	174.81	203.62	198.42	194.22
Projected Sales (MU)		4773	5023	5124	5226	5331	5437
Total Impact on Tariff Rs./unit)		**0.0550**	**0.1946**	**0.3412**	**0.3896**	**0.3722**	**0.3572**

For detail calculation of Tariff Impact with & without Grant, kindly refer Annexure AY & AZ respectively.

The above Table No. 103 indicates the likely impact on tariff over a period of six years. It can be observed that the likely impact on tariff is without Grant Rs.0.0856 per unit in 2023-24 moving to Rs 0.5469 per unit in 2028-29.

The above Table No. 104 indicates the likely impact on tariff over a period of six years. It can be observed that the likely impact on tariff is with Grant Rs.0.0550 per unit in 2023-24 moving to Rs 0.3572 per unit in 2028-29.

Appendix-A

Reply to the Data Gaps raised by Hon'ble Commission on "RDSS DPR of Rs. 1578.39 Cr submitted to MERC on 05.10.2023".

Data Gap No.1: the PFC vide letter dated 21.11.2021 has approved the following program under RDSS Scheme.

Sr. No.	PFC Approved Particulars	PFC Approved Cost in Rs. Cr.	Proposed Cost in Rs. Cr.	Reason
1	ERP, Billing Software and IT/OT enablement Works	75.98	236.95	Submit the reason for increase in the projected cost (211% from that submitted with PFC)
2	Implementation of SCADA & DMS	143.72	206.81	Submit the reason for increase in the projected cost (44% from that submitted with PFC)
3	Replacement of Old Switchgears	116.03	209.80	Submit the reason for increase in the projected cost (80% from that submitted with PFC)
4	Renovation/ Augmentation of Infrastructure at Power/ Receiving Sub Stations	50.23	49.83	-
5	Renovation/ Augmentation of Infrastructure at Distribution Sub Stations	201.38	210.79	Submit the reason for increase in the projected cost (5% from that submitted with PFC)
6	Renovation/Augmentation of HV and LV Lines	313.03	586.69	Submit the reason for increase in the projected cost (87% from that submitted with PFC)
7	Auxiliary component cost of consumer metering	72.53	83.13	Submit the reason for increase in the projected cost (14% from that submitted with PFC)
	Total	**972.90**	**1584.00**	Justification for increase in cost? PFC is providing funds of Rs 592.49 Cr How the additional cost of Rs 991.51 Cr will be arranged. BEST in the past could not complete many of the projects approved under Capex due to monetary constraints. On that background submit justification for additional cost.

Reply: For proposed Cost in the DPR and reasons for increase in projected cost against PFC Approved cost, kindly refer following table:

Sr. No.	PFC Approved Particulars	PFC Approved Cost in Rs. Cr.	Proposed Cost in Rs. Cr.	Reason and reply for the same
A	B	C	D	E
1	ERP, Billing Software and IT/OT enablement Works	75.98	235.93	For reason to increase in the projected cost (211% from that of Approved by PFC), ***kindly refer Para 1.1***
2	Implementation of SCADA & DMS (ADMS)	143.72	182.15	For reason to increase in the projected cost (27% from that of Approved by PFC), ***kindly refer Para 1.2***
3	**RSS Infrastructure Works**			
(i)	Replacement of Old Switchgears	23.47	42.80	For reason to increase in the projected cost (82% from that submitted with PFC), ***kindly refer Para 1.3***
(ii)	Renovation/ Augmentation of Infrastructure at Power/ RSS	50.23	56.99	For reason to increase in the projected cost (13% from that of Approved by PFC), ***kindly refer Para 1.3***
(iii)	Renovation/Augmentation of 33 kV HV Lines	159.22	405.12	For reason to increase in the projected cost (167% from that of Approved by PFC), ***kindly refer Para 1.3***
	Total (3)	**232.92**	**504.91**	
4	**DSS Infrastructure Works**			
(i)	Replacement of Old Oil Type Switchgears	92.56	121.81	For reason to increase in the projected cost (32% from that of Approved by PFC), ***kindly refer Para 1.4***
(ii)	Renovation/ Augmentation of Infrastructure at DSS	201.36	210.16	For reason to increase in the projected cost (4% from that of Approved by PFC), ***kindly refer Para 1.4***
(iii)	Renovation/Augmentation of 11 kV HV and LV Lines	153.81	358.96	For reason to increase in the projected cost (144% from that of Approved by PFC), ***kindly refer Para 1.4***
	TOTAL (4)	**447.73**	**690.93**	
5	Auxiliary component cost of consumer metering	72.53	82.05	For reason to increase in the projected cost (13% from that submitted with PFC) ***kindly refer Para 1.5***
6	PMA Charges	17.07	15.24	-
7.	MDM Cost	-	-	MDM is not part of PFC approved RDSS, hence now removed from scope of work & cost sheet.
	Total	**989.95**	**1711.23**	For reason to increase in the projected cost (76% from that of Approved by PFC) ***kindly refer Para 1.6***

Note: Kindly refer column 'D'. It seems that total proposed costing of RDSS project is Rs.1711.23 Cr which is more as compared to the proposed cost submitted in the DPR. It is because of the revision in RI Charges by BMC.

Kindly refer above table, PFC Approved Project cost (including PMA Charges) is given in column 'C'. Tender wise proposed cost including RI Charges (RI Charges is not part of Tender) in the DPR is given in Column 'D'.

1.1 ERP, Billing Software and IT/OT enablement Works: Reason to increase in the projected cost against PFC Approved Cost

Reply: (i) The comparison table showing details of 'BEST proposed Cost' and 'PFC Approved Cost' for Implementation of ERP, Billing Software & IT/OT enablement works is given in the following table (PFC has given reasoning for estimated approved cost)

Sr. No.	Proposed Work	UOM	BEST PROPOSAL		PFC APPROVED		PFC Cost Estimation Reasoning
			Qty	Amt. (in Cr.)	Qty	Amt. (in Cr.)	
1.	New MBC Solution (SaaS Mode	LS	1	77.19	1	22.59	MBC considered on SaaS model @ Rs 5.29 per customer per month basis for 5 years (Ref: Sanctioned cost of similar sized Utility i.e. JPDCL, KPDCL)
2.	ERP Solution License cost Implementation of ERP System (MM, FICO, HCM, AM, DMS, BI/BW)	LS	1	99.98	1	32.19	Rate considered for ERP Licenses are referred from IPDS scheme and comparable from already sanctioned RDSS states. Inclusive of 22.5% per year for ATS charges for 2 years
4.	Infrastructure Hardware (IaaS) Cost	LS	1	40.77	1	8.70	Restricted to 20% of the proposed cost for the Infra required for ERP deployment
5.	Network connectivity across all sites, head office and central cloud infrastructure	LS	1	4.98	1	6.67	Estimated based on the Sanctioned cost of MSEDCL
6.	Complete setup of centralized Customer Call Centre	LS	1	7.93	1	2.21	Rate considered from IPDS scheme
7.	Contingency Charges@5% of Project Cost	LS	1	19.65	1	3.32	
	TOTAL			**250.50**		**75.98**	

(ii) Tender No. 73746 was advertised for appointment of System Integrator (SI) for Implementation of ERP, Billing Software & IT/OT enablement works, bid opening and closing date was 06.06.2022 and 19.09.2022 respectively. Tender was postponed for **8 times**, still there was no response from the vendors. Hence, **finally tender is cancelled on 10.10.2022 due to administrative reasons.**

(iii) Further to this, again Tender No. 74915 was advertised for appointment SI, Bid opening date was 09.01.2023 and **after giving extensions for 16 times** finally bid was closed **on 16.05.2023**. Technical bid and price bid was opened on **24.05.203** & 26.05.2023 respectively. For this tender, by giving 16 times extensions for better response from vendors, only one vendor has quoted i.e. Infinite Computer Solutions India Ltd. With contractual value of Rs. 235.93 Cr.

(iv) The cost achieved in the tender is Rs.235.93 Cr as against estimated cost of Rs.250.50 Cr (6% lower against estimated cost).

(v) Analysis of Rates Received in the Tender:

The DPR submitted by the Undertaking for Selection of SI for Supply, Installation, Commissioning, Implementation and Support for IT Applications and Infrastructure under RDSS scheme, the estimated cost was Rs. 250.50 Cr and the bid received from Infinite Computer Solutions India Pvt. Ltd. is Rs. 235.93 Cr which is 6% lower. From this, it can be concluded that the rates received in the tender is quite reasonable.

1.2 ADMS (SCADA & DMS):- Reason to increase in the projected cost against PFC Approved Cost (27%)

Reply: - (i) The comparison table shows details of 'BEST proposal Cost' and PFC Approved Cost' for Implementation of ADMS is given in the following table:

Sr. No.	**UOM**	**BEST PROPOSAL**			**PFC APPROVED**		
		Qty	**Unit Rate**	**Amt. (in Cr.)**	**Qty**	**Unit Rate**	**Amt. (in Cr.)**
1	LS	1	-	223.20	1	-	143.72

PFC cost committee reviewed and restricted the cost based on benchmarking cost mentioned in DPR template.

(ii) Details of PFC Approved Cost, Actual Tendering Cost with FMS charges are given in the following table.

Sr. No.	**Particulars**	FMS Charges	**Cost in Cr.**	**Variation**
1.	PFC Approved Cost	2 Years	143.72	-
2.	Actual Tendering Cost	7 Years	204.76	42%
3.	**Actual Tendering Cost**	**5 Years**	**182.15**	**27%**
4.	FMS Charges (3-2)	2 Years	22.61	-

(iii) To appoint Project Implementation Agency (PIA) of ADMS with 7 years FMS, Tender No. 74909 was invited through open bidding process and technical bid and Price Bid was opened on 09.01.2023 and 13.01.2023 respectively. In the tender, 3 Nos. of bidders were quoted for said work. Thereafter, the tender was awarded to the LAO firm i.e. L & T Ltd. with contractual value of Rs. 204.76 Cr (FMS-7 Years) vide Letter No. DMM/SB/10/T-TA74909/5413/2022-23 dated 03.03.2023 LoA. ***For copy of LoA, kindly refer, Annexure-BS1.***

(a) In above mentioned LoA, Annexure B- Price Break-Up of Total Contractual Value of Recommended Firm, at Sr.No. 8.02, 8.05 & 9.02, the quantity has inadvertently been mentioned as per RFP. However, as per Corrigendum II dtd. 07.12.2022, Annexure-X1, Key Additional Points-Sr. All bidders shall quote for item no. 8.02 **(Qty- 2332) & 8.05 (Qty-518)** as per specified quantity; however, at the time of order the actual quantities shall be **2007 & 739** (cost will be adjusted as per pro-rata.

(c) As per Corrigendum III dtd. 21.12.2022, Sr. No. 2 Bidders shall have to quote annual charges for FMS in the BOQ format while BOQ format have provision for 7 years of FMS, FMS charges shall be calculated on Pro-rata basis for 5 years. Kindly note that the cost of the following-

1) Installation, Testing and Commissioning Cost to Integrate Entire SCADA & IT (relevant to SCADA) Infrastructure (15% of total project cost).

2) Integration with legacy applications & Data Migration (3% of total project cost)

3) Training for the Employees (2% of total project cost) will also change accordingly.

(d) In view of above, earlier Annexure B provided in LoA is revised, therefore, the Evaluated Contractual Value has reduced from **Rs.204,75,52,097.77 to Rs.182,15,00,255.70.** All other Annexure and terms & conditions of LoA remain the same. ***For details of revised LoA issued to M/s. L & T Ltd., kindly refer Annexure-BS2.***

(iv) PFC has approved FMS for 2 years. However, BEST has issued LoA by considering 5 years FMS, resulted to increase in proposed cost as against PFC Approved Cost.

(vi) The cost of ADMS items such as Additional Relay Test setup, Testing Kit, Miscellaneous items etc. costing of Rs.17.03 Cr is not considered by the Cost Approving Committee.

(viii) **Analysis of Rates received in the Tender**:

PFC has approved DPR of Rs.143.72 Cr for ADMS Scheme. While approving the same, Cost Committee has not considered some of the important items such as Separate Cyber Security Server & Software, Field Force Management (FFM), Testing Equipments (TE), etc. as these are not part of their approved scheme. Also, for some of the approved items, PFC has considered their reference rates as against our budgetary rates. Tender was advertised taking into consideration all the above-mentioned items as they are essential for completion of ADMS Project. Therefore, the total cost received is higher than the approved DPR cost but within our budgeted estimate of approx. Rs.223.20 Cr.

The Undertaking has received LAO offer of L & T Ltd. (Tr.1) as Rs. 204.76 Cr. Further, L2 offer received against current tender i.e. Rs.231.53 Cr of Enzen Global Solutions Pvt. Ltd. (Tr.2) which is 13.07% higher when compared to the L1 offer. Further,

From the above, the rates received through current tender seem to be quite competitive and reasonable.

1.3 Receiving Sub-Station Infrastructure Works:

(i) Replacement of Old 33 kV, 1500 MVA Switchgears and 11 kV, 350 MVA old Switchgears (Qty- 32 Nos.) at RSS: - Reason to increase in the projected cost against PFC Approved Cost

Reply: (i) The comparison table showing details of 'BEST proposed Cost' and 'PFC Approved Cost' for replacement of old Primary and secondary switchgears is given in the following table:

Sr. No.	UOM	BEST PROPOSAL			PFC APPROVED		
		Qty	Unit Rate	Amt. (in Cr.)	Qty	Unit Rate	Amt. (in Cr.)
1	Nos.	19	19.79	3.76	19	0.1732	3.29
2	Nos.	32	81.47	26.07	32	0.6306	20.18

1. **33 KV, 1500 MVA old Switchgears (Qty- 19 Nos.)**: While approving the cost of item following criteria is considered by the cost Approving Committee.

- For material cost, PFC has considered the latest P.O. of BEST which was issued to the firm in Feb-22, the cost of Switchgear unit is Rs 14.78 Lakh/unit (M/s. Stelmec Ltd.). However, BEST's estimation was based on the IPDS P.O. (M/s. L&T Ltd. in 2018). ***For copy of latest P.O., kindly refer Annexure-CK, Pg. No.1 and for copy of IPDS P.O., kindly refers, Annexure- CL, Pg. No.2.***
- Cost committee compared the rates of latest P.O (Rs. 14.78 Lakh/unit) with IPDS LOA (Rs. 19.79 Lakh/Unit). Further to this, Cost Committee considered the final unit cost of Rs.17.32 Lakh/unit by considering escalation factor for three years. For primary switchgear, 'PFC Approved Per unit cost' is Rs. 0.1732 Cr. and per unit cost' arrived through 'Actual Tendering' is 0.2581 Cr.
- The main difference between Latest P.O and IPDS LoA is that from latest P.O BEST is purchasing switchgears directly from the firm whereas in IPDS LoA, PIA is purchasing switchgears for BEST. Obviously, the cost of switchgears purchased by PIA is on higher sided as compared to BEST purchasing switchgears directly from the firm, Stelmec Ltd.
- For Erection & Transportation cost of switchgear, Committee considered the cost as per BEST SOR. It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference.
- For Erection & Transportation, the cost of BEST SOR is at lower side as compared to PIA (IPDS) cost.

2. **11 kV, 350 MVA old Switchgears (Qty- 32 Nos.)**: While approving the cost of item following criteria is considered.

- For material cost, PFC has considered the latest P.O. of BEST which was issued to the firm in Nov-20 (Megawin Switchgear Pvt. Ltd.), the cost of Switchgear unit is Rs 43.30 Lakh/unit (without taxes). However, BEST's estimation was based on the IPDS P.O. (M/s. L&T Ltd. in 2018). ***For copy of latest P.O., kindly refer Annexure-CK, Pg. No.4 and for copy of IPDS P.O., kindly refers, Annexure-CL, Pg. No. 2.***
- Cost committee compared the rates of latest P.O (Rs. 43.30 Lakh/unit) with IPDS LOA (Rs. 54.38 Lakh/Unit). Please note that Rs.43.30 Lakh/unit cost is without taxes, however, Gross Rate of switchgears is Rs.52.00 Lakh/unit (Latest P.O.). Cost committee required to be compared the Gross Rates of Latest P.O. (Rs.0.52 Cr) with Gross Rates of IPDS LoA (0.5438 Cr), but cost committee compared the latest P.O. Rates without Taxes with Gross Rates of IPDS LoA, resulting, increase in proposed cost as against PFC approved cost.
- Cost committee considered the final unit cost of Rs.63.09 Lakh/unit by considering 15% escalation factor. For 11 kV Bus Section, 'PFC Approved Per unit cost' is 0.6309 Cr. and per unit cost arrived through 'Actual Tendering' is Rs. 1.19 Cr.

- The main difference between Latest P.O and IPDS LoA is that from latest P.O BEST is purchasing switchgears directly from the firm (Megawin Switchgear Ltd.) whereas in IPDS LoA, PIA (M/s. L & T Ltd) is purchasing switchgears for BEST. P.O. Obviously, the cost of switchgears purchased by PIA is on higher sided as compared to BEST purchasing switchgears directly from the firm,

- For Erection & Transportation cost of switchgear, Committee considered the cost as per BEST SOR. It is to be mentioned that the Erection & Transportation cost of BEST SoR is much lower side as compared with PIA cost (IPDS) due to wage difference.

1.3. (ii) Renovation/ Augmentation of Infrastructure at Power/ RSS, Reason to increase in the projected cost against PFC Approved Cost (13%):

Reply: The comparison table shows details of 'BEST proposal Cost' and PFC Approved Cost' for Replacement /additional of 33/11kV, 16 MVA T/Fs is given in the following table:

Amount in Cr.

Sr. No.	UOM	BEST PROPOSAL			PFC APPROVED		
		Qty	Unit Rate	Amt. (in Cr.)	Qty	Unit Rate	Amt. (in Cr.)
1	Nos.	20	3.2375	64.75	20	2.5116	50.23

While approving the cost of above said item following criteria is considered by the cost approving Committee.

- For material cost, BEST estimation was based on the IPDS LoA (M/s. L & T Ltd., 2018). As per latest P. O. (Voltamp Transformers Ltd., May-22) the cost of 16 MVA, ONAN/ONAF, 33kV/11 kV TF with NIFP is Rs 2.224 Cr/unit. ***For copy of P.O, kindly refer Annexure-CK, Pg. No. 5.***

- Committee adopted final unit cost of Rs. 2.51 Cr/unit considering transportation, Dismantling, Installation, termination cost as 11% of Material Cost.

- Cost committee considered the final unit cost of Rs.2.51 Cr/unit as against Actual Tendering per unit cost' of Rs. 2.85 Cr/unit. However, BEST estimated per unit cost was 3.24 Cr and achieved cost through tender is about 14% lower side.

- The main difference between Latest P.O and IPDS LoA is that from latest P.O BEST is purchasing TFs directly from the firm (Voltamp Transformers Ltd.) whereas, in IPDS LoA, PIA (M/s. L & T Ltd) is purchasing TFs for BEST. P.O. Obviously, the cost of TFs purchased by PIA is on higher sided as compared to BEST purchasing TFs directly from the firm,

- For Erection & Transportation cost of TFs, Committee considered the cost as per BEST SOR. It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference.

1.3. (iii) Renovation/ Augmentation of 33 kV HV cable, Reason to increase in the projected cost against PFC Approved Cost (13%):

Reply: The comparison table shows details of 'BEST proposal Cost' and PFC Approved Cost' for Replacement /additional of 33 kV cable is given in the following table:

Amount in Cr.

Sr. No.	UOM	BEST PROPOSAL			PFC APPROVED		
		Qty	Unit Rate	Amt. (in Cr.)	Qty	Unit Rate	Amt. (in Cr.)
1	Nos.	120	1.3303	159.65	120	1.3268	159.22

While approving the cost of above said item following criteria is considered by the cost approving Committee.

- Cost Committee visited places where Cu cable laying work was in progress and examined the reasons for high laying cost in Mumbai.
- For material cost, BEST estimation was based on BEST SOR (FY2021-22). As per latest purchase order of Sept.2021, the cost of 3CX300 SQ. MM. is Rs 1.33 Cr/unit. For copy of BEST SOR, ***kindly refer Annexure-CM, Pg. No.1.***
- Committee reviewed Cu cable rate analysis and found the rate on lower side when compared with IPDS work LOA (M/s L & T Ltd., FY18) and latest P.O. (M/s. Polycab India Ltd., Sep 21). Accordingly, Cost committee adopted final unit cost of Rs.1.326 Cr/km by considering 05% escalation on latest P.O. (M/s. Polycab India Ltd., dated Sept. 2021) cost and 18% GST. ***For copy of P.O., kindly refer Annexure-CK, Pg. No.8.***
- Cost committee considered the Erection & Transportation cost of cable as per BEST SOR. It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference.
- Cost committee does not consider the RI charges which constitute major costing part of the scheme. Per Km rate arrived in the tender is of Rs. 1.85 Cr as against approved cost of Rs.1.33 Cr. Separate RI Cost per km is about Rs.1.69 Cr.
- In the DPR, cost proposed for RI Charges for 33 kV, 3CX300 SQ. MM Cu XLPE cable (120 km) is about Rs. 193.43 Cr which is 48% of total scheme cost (Rs. 405.12 Cr). Without RI cost, Scheme Cost will be about Rs. 222.27 Cr which is 52% of total scheme Cost. ***For copy of latest BMC RI Circular, kindly refer, Annexure-CC.***

Technical Justification

- Outer Sheath HDPE PVC with Water Swellable Tape.
- Proposed Replacement due to very old cables PILC (> 50 years) and having more number of joints, thus prone to frequent failures.

1.3 (iv) Analysis of Rates received in the Tender:

The estimated amount and Cost Analysis is given in the following table:

Sr. No.	Targeted Interventions for the system Strengthening	Unit	QTY	Per Unit Cost (Rs in Cr)	Estimated outlay (Rs in Cr)
1.	Supply, Installation & Commissioning of 33 kV, 1500 MVA switchgears & replacement of existing switchgears at RSS	Nos.	19	0.198	3.762
2.	Supply, Installation & Commissioning of 11 kV, 350 MVA switchgears & replacement of existing switchgears at RSS	Nos.	32	0.815	26.080
3.	Additional/replacement of T/Fs (Additional-2 Nos. & Replacement -18 Nos.)	Nos.	20	2.700	54.000
4.	Replacement /Additional 33 kV, 3CX300 sq.mm. Cu. XLPE Cable to improve the quality of supply	K..	120	1.600	192.000
	Approx. Total Cost In Cr.				**275.842**

Considering cost of overheads, Goods & Service Tax, Profit Margin, etc. which adds to the above worked out cost, the rates received by the undertaking in the tender seems to be quite competitive and reasonable.

1.4 Replacement of Old kV, 250 MVA Oil Type Switchgears (Qty- 396 Nos.) and 11 kV, Oil Type RMUs (Qty- 95 Nos.) at DSS: - Reason to increase in the projected cost against PFC Approved Cost.

Reply: (i) The comparison table showing details of 'BEST proposed Cost' and 'PFC Approved Cost' for replacement of old Oil Type switchgears/RMUs are given in the following table:

Sr. No.	UOM	BEST PROPOSAL			PFC APPROVED		
		Qty	Unit Rate	Amt. (in Cr.)	Qty	Unit Rate	Amt. (in Cr.)
1	Nos.	564	21.40	120.70	396	0.2140	84.74
2	Nos.	118	9.17	10.80	95	0.0823	7.82

1. **Sr. No. 1, 11 kV, 250 MVA Oil Type Switchgears (Qty- 396 Nos.)** While approving the cost of item following criteria is considered.
   - For material cost, BEST estimation was based on BEST SOR and Committee reviewed the rate analysis submitted by BEST, based on LOA rates in IPDS. The Cost Committee adopted final unit cost of Rs. 21.40 Lakh/unit considering the rate analysis done by BEST. ***Kindly refer Annexure-CM, Pg. No.3.***
   - Cost committee considered the final unit cost of Rs. 21.40 Lakh/unit and Actual Tender cost is Rs.25.53 Lakh/Unit. BEST SOR was for FY 2021-22 and Tender is opened in FY2022-23. Therefore, the cost of tender is on higher side due to market inflation.
2. **Sr. No. 2, 11 kV, Oil Type RMUs (Qty- 95 Nos.)**: While approving the cost of item following criteria is considered.
   - For material cost, BEST estimation was based on BEST SOR (Rs.9.17 Lakh/Unit) and Committee reviewed the rate analysis submitted by BEST, based on LOA rates

in IPDS. 3 Way and 4 Way cost was derived from P.O. Oct 21, considering 5% escalation on cost. The Cost Committee adopted final unit cost of Rs. 8.24 Lakh/unit considering the average cost of 3 Way & 4 Way Type RMUs.

- Cost committee considered the final unit cost of Rs. 8.24 Lakh/unit and Actual Tender cost is Rs. 9.89 Lakh/Unit. BEST SOR was for FY 2021-22 and Tender is opened in FY2022-23. Therefore, the cost of tender is on higher side due to market inflation.

- **Technical justification adopted by committee for higher Rates**:

  (i) Oil RMU technology is old and we have stopped the procurement of the same since 1998.
  (ii) The OCB switchgears have almost outlived their service life (25 years) and depreciated to minimum value being more than 25 years old.
  (iii) Spares are not available hence there is difficulty while attending breakdown.
  (iv) New SF6 RMU can be procured with automation compliant features.
  (v) It is prone to fire hazards and frequent periodic maintenance

1.4 (ii) Renovation/ Augmentation of Infrastructure at Distribution Sub Stations (DTs and SF6 RMUs), Reason to increase in the projected cost against PFC Approved Cost (4%):

Reply: The comparison table shows details of 'BEST proposal Cost' and PFC Approved Cost' for Replacement /additional of DTs and SF6 RMUs is given in the following table:

Sr. No.	UOM	BEST PROPOSAL			PFC APPROVED		
		Qty	Unit Rate	Amt. (in Cr.)	Qty	Unit Rate	Amt. (in Cr.)
1	Nos.	1021	0.3055	311.92	666	0.2895	192.80
2	Nos.	104	0.10	10.40	104	0.0823	8.56

1. **Replacement of DTs**: While approving the cost of DTs replacement, following criteria is considered by the cost approving Committee.
   - For material cost, BEST estimation was based on BEST SOR (2021-22). As per latest P.O. the cost of DT 995 kVA, ONAN type is Rs. 0.1247 Cr/unit. ***For copy BEST SOR, refer Annexure-CM. Pg. No.5 and for copy of latest P.O, kindly refer Annexure-CN, Pg. No.2***.
   - Committee reviewed the rate analysis submitted by BEST, based on LOA rates in IPDS. Accordingly, Cost Committee adopted final unit cost of Rs. 28.95 Lakh/unit (inclusive of ADP & LV pillars) considering the rate analysis done by BEST
   - For Erection & Transportation cost of DT, Cost committee considered the cost of DT as per BEST SOR (FY2021-22). It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference

2. **Replacement of SF6 RMUs**: While approving the cost of SF6 RMU replacement, following criteria is considered by the cost approving Committee.
    - For material cost, BEST estimation was based on BEST SOR (2021-22). As per latest Purchase Order the cost of RMU is Rs. 8.24 Lakh/unit. ***For copy BEST SOR, refer Annexure-CM. Pg. No.7 and for copy of P.O, kindly refer Annexure-CN, Pg. No. 6.***
    - Committee reviewed the rate analysis submitted by BEST, based on LOA rates in IPDS. Accordingly, Cost Committee derived the unit cost of 3 Way and 4 Way RMU from P.O. Oct 21 considering 5% escalation on cost. Accordingly, cost committee adopted final unit cost of Rs. 8.24 Lakh/unit considering average cost of 3 Way and 4 Way Type SF6 RMU's.
    - For Erection & Transportation cost of RMU, Cost committee considered the cost as per BEST SOR (FY2021-22). It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference.

1.4. (iii) Renovation/ Augmentation of 11 kV, 3CX240 SQ.MM HV cable & 1.1 kV, 4CX300 SQ.MM LV cable: Reason to increase in the projected cost against PFC Approved Cost:

Reply: The comparison table shows details of 'BEST proposal Cost' and PFC Approved Cost' for Replacement /additional of 11kV, HV & 1.1 kV LV cable is given in the following table:

Sr. No.	UOM	BEST PROPOSAL			PFC APPROVED		
		Qty	Unit Rate	Amt. (in Cr.)	Qty	Unit Rate	Amt. (in Cr.)
1	KM	413	0.6324	261.17	203	0.6324	128.38
2	KM	400	0.5087	203.48	50	0.5086	25.43

1. **11 kV, 3CX240 SQ.MM HV Cable:** While approving the cost of 11 kV cable, following criteria is considered by the cost approving Committee.
    - For material cost, BEST estimation was based on BEST SOR (Rs. 1552 /Mtr, FY2021-22). As per latest Purchase Order of September, 2021, the cost of 3CX240 SQ. MM. is Rs Rs.1705.10/Mtr. ***For copy BEST SOR, refer Annexure-CM. Pg. No.8 and for* copy of P.O, kindly refer Annexure-*CN, Pg. No.9.***
    - Committee visited places where cable laying work was in progress and examined the reasons for high laying cost in Mumbai. Accordingly, 'Cost Committee' reviewed cable rate analysis and found the rate (Rs.1552/Mtr, SOR 21-22) on lower side when compared with IPDS works LOA (Rs.1808/Mtr FY-18). Finally, Cost Committee approved unit cost of Rs. 0.6324 Cr/km (inclusive of laying, termination, transportation & excavation cost) considering 05% contingency cost and GST 18%.

- Cost committee considered the Erection & Transportation cost of cable as per BEST SOR (FY2021-22). It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference.
- While approving RDSS DPR for HV, LV Cables under Loss Reduction, RI charges are not taken into account by Cost committee. Whereas RI charges constitute major costing part of the scheme. Per Km rate arrived in the tender is of Rs. 0.2235 Cr/km (without RI Cost) as against approved cost of Rs.0.6324Cr/KM (without RI Cost). RI Cost per km is about Rs.1.18 Cr. Cost Committee approved Rs. 0.6324 Cr/km as against proposed cost of Rs. 1.41 Cr/km (with RI cost).
- In the DPR, Cost considered against RI Charges for 11 kV, 3CX240 SQ. MM Al. cable (200 km) is about Rs. 225.66 Cr which is 84% of total scheme cost (Rs. 268.35 Cr). Without RI cost, Scheme Cost will be about Rs. 42.69 Cr which is 16% of total scheme Cost.

2. **1.1 kV, 4CX300 SQ.MM LV Cable:** While approving the cost of 1.1 kV, 4CX300SQ. MM cable, following criteria is considered by the cost approving Committee.
    - For material cost, BEST estimation was based on BEST SOR (Rs. 1210 /Mtr, FY2021-22). As per latest Purchase Order of September, 2021, the cost of 4CX300 SQ. MM. is Rs Rs.1241.36/Mtr. **For copy BEST SOR, refer Annexure-CM. Pg. No.9 and** ***for copy of P.O, kindly refer Annexure-CN, Pg. No. 11.***
    - Committee visited places where cable laying work was in progress and examined the reasons for high laying cost in Mumbai. Accordingly, Cost Committee reviewed cable rate analysis and found the rate (Rs.1210/Mtr, SOR 21-22) on lower side when compared with IPDS work LOA (Rs.1455.36/Mtr, FY-18). Finally, Cost Committee approved unit cost of Rs. 0.5086 Cr/Km (inclusive of laying, termination, transportation & excavation cost) considering 05% contingency cost and GST 18%.
    - Cost committee considered the Erection & Transportation cost of cable as per BEST SOR. It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference.
    - Per Km rate arrived in the tender is of Rs. 0.21 Cr as against approved cost of Rs.0.5086 Cr. RI Cost per km is about Rs.1.69 Cr.
    - While approving RDSS DPR for HV and LV cables under Loss Reduction, Reinstatement (RI) Charges were not considered by Cost Committee. Whereas RI charges constitute major costing part of the scheme.
    - In the DPR, Cost considered against RI Charges for 4CX300 SQ. MM cable is about Rs. 80.59 Cr which is 89% of total scheme cost. Without RI cost, Scheme Cost will be about Rs. 10.02 Cr which is 11% of total scheme Cost.

1.4. (iii) Analysis of Rates received in the tender:

The estimated DPR cost for DSS Infra under Loss Reduction approved by PFC works out to Rs. 447.73 Cr and the LAO Bid received from Rahul Cables Pvt. Ltd. (Tr.1) is Rs. 420.65 Cr which is 6.07% lower. Further, when compared to the earlier tender Rate (i.e. 421.32 Cr) with the LAO rate received in the current tender (i.e. 420.65 Cr) for the same Bill of Quantities (BOQ), the rate received in the current tender is lower by 0.16%.

From the above, it can be concluded that the rates received in the tender seems to be quite competitive and reasonable

1.5 Auxiliary Components costs of Consumer Metering, Reason for increase in Projected cost (Rs. 82.05 Cr.) against PFC Approved Cost (Rs. 72.53 Cr.):

Reply: (i) The comparison table showing details of 'BEST proposed Cost' and 'PFC Approved Cost' for Auxiliary Components of consumer metering is given in the following table:

Sr. No.	UOM	BEST PROPOSAL			PFC APPROVED		
		Qty	Unit Rate	Amt. (in Cr.)	Qty	Unit Rate	Amt. (in Cr.)
1	Nos.	801374	0.0001386	111.05	523357	0.0001386	72.53

(ii) Cost Committee agreed to approve final unit cost of Rs. 1386 per consumer and total Rs. 72.53 Cr for 523357 consumers. However, Actual rates arrived through Tender is of Rs.82.05 Cr which is 13% higher against approved cost.

(iii) Tender No. 76221 was advertised for Appointment of PIA, bid opening and closing date was 09.02.2023 and 10.04.2023 respectively. Tender was postponed for 2 times for better response from the vendors and finally bid was opened on 24.04.2023.

(iv) The cost achieved in the tender is Rs.85.05 Cr as against PFC approved cost of Rs. 72.53 Cr (13 % on higher side).

(v) **Analysis of Rates received in the tender**:

Under RDSS Project, the Undertaking has placed contract for Advance Metering Infrastructure (AMI) for carrying out the work of replacement of existing energy meters by Smart meters. Auxiliary component for this Consumer SMART Metering Project involves work of replacement/ installation of new Meter Board, wiring or rectifying defective/ deteriorated wires / MCB, etc. The Undertaking has estimated the cost of subject project as 72.53 Crores in the base year 2022 which was agreed and approved by PFC under RDSS. Considering the cost escalation towards raw materials, labour, transportation, etc. during the last one year, the rates of LAO received by the Undertaking in the tender seems to be reasonable.

1.6 Project Management Agency (PMA):

Reply: (i) Following table is showing details of 'PFC Approved Cost' and 'BEST proposed Cost' for PMA (Smart Meter + Infrastructure Work).

Sr. No.	Particulars	Cost in Cr.	GBS in Cr.	BEST Part in Cr
1.	PFC Approved Cost	17.07	10.24	-
2.	Actual Tendering Cost	15.58	10.24	5.34
3.	**Revised Actual Tendering Cost**	**15.23**	**10.24**	**4.98**

(ii) A per CAPEX Regulation, 2022, Appendix-3, tender, tender was invited for Appointment of PMA, through open bidding. For getting competitive rates, BEST has advertised the tender in the local as well as all over India. The tender notice was also displayed on the BEST undertaking's e-tender website. **For better response tender was cancelled/postponed 3 times.** Techno-commercial bid and price bid was opened on 08.02.2023 and 16.02.2023 respectively. In the tendering process 3 Nos. of bidders have taken part. Details of offers received are given in the following table.

Tr. No.	Name of the Tenderer	Basic Rate (₹)	Total Contractual Value (₹)	Ranking
1	Wapcos Ltd.	13,20,00,000.00	15,57,60,000.00	1
2	IRCLASS Systems and Solutions Pvt. Ltd	Price Bid Not opened		-
3	REC Power Development and Consultancy Ltd.	23,39,75,280.00	27,60,90,830.00 Revised Rates **15,23,61,600.00**	**2 (#)LAO**

(iii) Initially the tender was awarded to the LAO viz. Wapcos Ltd. with total contractual value of Rs. 15.58 Cr.

(iv) Wapcos Ltd. has not any experience of such work, therefore, management has decided to allot the said work to REC Power Development and Consultancy Ltd. (2nd LAO) who has revised their Rates below of LAO i.e. 15.24 Cr. ***A copy of revised LoA is enclosed as Annexure-CR.***

Data Gap No.2: Submit the PMA Approved Cost and the cost considered under the proposal. Also, how PMA cost is bifurcated for various items in the proposal.

Reply: **(A)** Approved PMA Cost/Charges (Column E), Approved Government Budgetary Support (Column F) for PMA Charges and PMA Charges considered under the proposal (Column G) is given in the following table.

Amount in Cr.

Sr. No.	Particulars	Total Project cost	GBS	Approved PMA Charges/ Cost	Approved GBS for PMA Charges	Proposed PMA Charges
A	**B**	**C**	**D**	**E**	**F**	**G**
1.	Smart Metering Works	659.17	98.8755	2.47	1.48	2.47000
2.	Infrastructure Works – Loss Reduction	972.88	583.728	14.59	8.76	12.76616
	Total	**1632.05**	**682.60**	**17.07**	**10.24**	**15.23616**

1. For Smart Metering- GBS is 15% of approved Cost & for infrastructure works-GBS is 60% of approved cost.
2. For Smart Metering- PMA Charges are 2.5% of approved GBS (Rs.98.88 Cr) & for infrastructure works - PMA Charges are 1.5% of project approved cost.
3. For Smart Metering and infrastructure works GBS for PMA Charges are Rs. 1.48 Cr (60% of approved PMA Charges, Rs. 2.47 Cr) & Rs. 8.76 Cr (60% of approved PMA Charges, Rs. 14.59 Cr) respectively. For detail calculation, ***kindly refer Excel Sheet, enclosed as Annexure-BA.***
4. For Prepaid Smart Meters, PMA Cost is consider / assumed as Rs. 2.47 Cr (PMA approved cost for Smart Meter) and balance PMA Cost of Rs. 12.76616 Cr.

(B) **Total PMA Cost considered under the proposal and Bifurcated of PMA cost for various items in the proposal**:

1. The PMA Cost received through tender (Rs.15.23616 Cr) is for Prepaid Smart Meters and Infrastructure related works. For Smart Metering PMA Cost is consider / assumed as Rs. 2.47 Cr (PMA approved cost for Smart Meter) and balance PMA Cost of Rs. 12.77 Cr is to be divided among the Distribution Infrastructure related works. These are as follows:-
   (i) Renovation/Augmentation of Infrastructure at Power /Receiving Substation
   (ii) Renovation/Augmentation of Infrastructure at Distribution Substation
   (iii) Auxiliary Component required for Smart Metering
   (iv) Implementation of SCADA & DMS (ADMS) and
   (v) ERP, Billing Software and IT/OT enablement works.

2. Please note that PFC has approved GBS for Replacement of old switchgears (RSS & DSS items) and Renovation / Augmentation of HV and LV lines (RSS & DSS items). In the following table costing of RSS & DSS items are separated.

3. **Bifurcated of PMA cost for various items in the proposal is given in the following table:**

							Amount in Cr.
Sr. No.	**Item Description**	**PFC Approved Project Cost**	**Tender Cost**	**PFC Approved GBS**	**PMA Charges**	**GBS for PMA Charges**	**Total PFC Grant / GBS (including PMA)**
A	**B**	**C**	**D**	**D**	**E**	**F**	**G =D+F**
1	Smart Meters	659.17	1303.16	98.88	2.47	1.48	100.36
	Infrastructure work						
2	Receiving / Power Substations (RSS)	232.92	525.16	**139.75**	3.0564	2.10	141.85
3	Distribution Substation (DSS)	447.73	708.74	**268.64**	5.8751	4.03	272.67
4	Auxiliary Equipments	72.53	82.05	**43.52**	0.9517	0.65	44.17
5	ADMS	143.72	182.15	**86.23**	1.8859	1.29	87.53
6	ERP, Billing Software, IT/OT enablement work	75.98	235.93	**45.59**	0.9970	0.68	46.27
7	**TOTAL COST in Cr. (1 to 5)**	**972.88**	**1734.03**	**583.73**	**12.76616**	**8.76**	592.49

4. **Individual item wise PFC Approved costing (RSS and DSS) is given as follows.**

- **Receiving / Power Substations (Tender Cost, Rs.525.16 Cr.)**:-

(i) Replacement of 33 kV, 1500 MVA switchgear with Relays (Qty- 18, Cost Rs. 3.29 Cr)
(ii) Replacement of 11 kV, 350 MVA switchgear with Relays (10 switchgear per panel) (Qty- 32, Cost Rs. 20.18 Cr)
(iii) Additional / Replacement of T/Fs (Power Transformer) 16/20 MVA ONAN/ONAF (Qty- 20, Cost Rs. 50.23 Cr) and
(iv) Replacement / Additional laying of 33 kV with 3CX300 sq. mm cu. XLPE Cables (Qty-120 kM, Cost Rs.159.22 Cr).

- **Distribution Substations (Tender Cost, Rs. 708.74 Cr.)**:-
  - (i) Replacement of 11 kV, OCB switchgears by VCB switchgears at DSS (Qty- 396, Cost Rs. 84.74 Cr)
  - (ii) Replacement of Oil Ring Main Units by SF6 Ring Main Unit (Qty- 95, Cost Rs. 7.82 Cr)
  - (iii) Augmentation of Substations (Additional / Replacement of DTs (995 kVA along with Breakers / Cable) (Qty- 666 , Cost Rs. 192.80 Cr),
  - (iv) Replacement of SF6 RMUs (Qty-104 kM, Cost Rs.8.56 Cr),
  - (v) Replacement / Additional of HV weak/old cable with 3CX240 sq.mm XLPE Al Cables (Qty- 203 kM, Cost Rs. 128.38 Cr) and
  - (vi) Replacement / Additional of LV weak/old cable with 4CX300 sq.mm XLPE Al Cables (Qty-50 kM, Cost Rs. 25.43 Cr.).

5. PFC Approved GBS (Rs. 583.73 Cr) is distributed / divided among the Infrastructure Items (Sr. No. 2 to 6) in the proportion of PFC Approved Project Cost (refer Column C, Sr. No. 1 to 6).

6. Proposed PMA Cost (Rs. 15.24 Cr) is divided between Smart Metering and Infrastructure Works as Rs. 2.47 Cr and 12.77 Cr respectively, kindly refer Column E, Sr. No. 1 and Sr. No. 7.

7. Balance PMA Cost (Rs. 12.77 Cr) is distributed /divided among the all items of the works of Distribution Infrastructure, kindly refer Column E, Sr. No. 2 to 6.

   For detail bifurcation of Approved and Proposed PMA cost under DPR, kindly refer Annexure-BA, Excel Sheet.

Data Gap No.3: Whether the Items in the proposal are overlapping with the DPRs approved by the Commission in the past? If yes submit item wise detail sheet showing scope of work, sanctioned date, approved cost, expenditure till date, Current status, closure report if any, reason for including the items / sub-items in RDSS. Separate Sheet for RSS, DSS, HV/LV Cables, HT/LT switchgears in the form of approved Vs proposed to be submitted.

Reply: **(A)** Yes, in case of Power / Receiving Substation items, some of the items in the proposal are overlapping with the DPRs approved by the Commission in the past.

(B) Item wise detail sheet showing Scope of work, sanctioned date, approved cost, expenditure till date and current status , closure report of if any, is given in the following table.

Sr. No.	MERC Approved Reference	Approved cost of DPR	Sanction Date	Scope of work	Approved cost (in Cr)	Capex till date	Current Status
(I)	**RSS - T/F Replacement**						
1.	MERC/TECH V/ CAP/DPR/20122013/ 02688	36.63 Cr	22.02.2013	Replacement of T/F and associated equipments (Kussara RSS T/F No. 2, Mahalaxmi T/F No. 1 & 3 & Mazgaon Dock T/F No. 2)	5.96 Cr	-	1. T/F not yet taken for replacement. Proposed to be replaced under RDSS. 2. DPR at Sr. No.1 is closed and for *‘Closure Report’ kindly refers, Annexure –BB.* 3. DPR at Sr. No. 2 & 3, T/Fs at Sewree (2 Nos.) & Sitaladevi (1 No.) are to be treated as deleted from list of work, as theses T/Fs are to be replaced under RDSS work.
2.	MERC/Capex/2017-18/4706	58.86 Cr	16.11.2017	Replacement of T/F at Sewree RSS and associated equipments (T/F No. 1 & 3)	2.82	-	
3.	MERC/Capex/2022-23/0556	56.07 Cr	14.11.2022	Replacement of T/F at Sitaladevi RSS T/F No. 4 and associated equipments	1.54 Cr.	-	
4	MERC/Capex/2019-20/135	15.58 Cr	10.05.2019	Installation of additional T/F at Naval Dock and associated equipments including civil work	2.38 Cr.	1.81 Cr	Cost of T/F was not considered in the DPR, since earlier it was proposed to install old T/F at RSS. Copy of cost Sheet submitted in the DPR *is enclosed along with 'Closure Report' as Annexure-BC, Pg. No. 4.*
(II)	**RSS - 33 kV Switchgear Replacement**						
1	MERC/TECH V/ CAP /DPR /2012 2013 / 02688	36.63 Cr	22.02.2013	Replacement of 33 kV Switchgears at Mumbadevi (2 Nos. & Masjid 1 No.)	0.39	-	1. 33 kV switchgears not yet taken for replacement. Proposed to be replaced under RDSS. 2. DPR at Sr. No. 1 is closed and for ‘Closure Report’ *kindly refers, Annexure –BB.* 3. DPR at Sr. No. 2, 3 & 4, 33 kV Switchgears at KEM, Ballard Estate, Mazgaon Dock, Colaba (1 No. each), Kingsway & Mahim (2 Nos. each) are to be treated as deleted from the list of work. Since, the said work is included in the RDSS DPR.
2	MERC/Capex/2017-18/4706	64.09 Cr	16.11.2017	Replacement of 33 kV Switchgears at KEM RSS (1 No.)	0.10	-	
3	MERC/Capex/2017-18/4706	58.86 Cr	16.11.2017	Replacement of 33 kV Switchgears at Ballard Estate (1 No.)	0.10	-	
4	MERC/Capex/2020-21/553	40.60 Cr	15.12.2021	Replacement of 33 kV Switchgears at Mazgaon Dock (1 No.), Colaba (1 No.), Kingsway (2 Nos.) & Mahim (2 Nos.)	1.35	-	

(III)- RSS - 11 kV Switchgear Replacement

1	MERC/TECH V/ CAP/DPR /2012 2013/02688	36.63 Cr	22.02.2013	***Replacement of 11 kV Bus Sections at Wadalba (1 No.) and Grant Road (2 Nos.) are deleted from the DPR while preparing DPR costing Rs.40.60 Cr.)***			1. DPR at Sr. No.1, 11 kV bus sections not yet taken for replacement, as these items is deleted from the list of work while preparing DPR at Sr. 3.
2	MERC/Capex/2017-18/4706	64.09 Cr	16.11.2017	Replacement of 11 kV Bus Sections at Mahim Causeway (2 Nos. and Esplanade (3 Nos.)	2.15		2. Now, DPR at Sr. No. 1 is closed and for 'Closure Report' ***kindly refers, Annexure –BB.*** .
		58.86 Cr		Replacement of 11 kV Bus Sections at Mahim (2 Nos. & Malabar Hill (1 No.)	1.29		
3	MERC/Capex/2020-21/553	40.60 Cr	15.12.2021	Replacement of 11 kV Bus Sections at Grant Road (4 Nos.), Sewree (2 Nos.), Dharavi (2 Nos.), Wadala (2 Nos.), Mahim (2 Nos.), Prabhadevi (2 Nos.), Worli (2 Nos.), KEM (1 No.), Mahalaxmi (2 Nos.) and Nair Hosp (1 No.)	8.79	-	3. DPR at Sr. No. 2 & 3, 11 kV Bus Sections at KEM, Nair Hosp & Malabar Hill, (1 No. each), Mahim Causeway, Mahim , Sewree, Dharavi, Prabhadevi, Wadala, Mahim & Worli & Mahalaxmi (2 Nos. each), Esplanade (3 Nos.), Grant Road (4 Nos.) are to be treated as deleted from the list of work. Since, the said work is included in the RDSS DPR.

After getting Commission's in principle approval, above mentioned DPRs are also to be closed,

(C) Reason for including the items / sub-items in RDSS: -

1. The Government of India's has launched the RDSS for strengthening of supply infrastructure for improvement in the quality, reliability, affordability of power supply to consumers, to improve operational efficiencies and to reduce AT&C losses and to reduce ACS-ARR gap to zero by providing financial assistance to DISCOMs.

2**.** To take benefit of the RDSS for strengthening of electrical network by way of replacing age old Power Transformers, DTs, Oil Type switchgears / Oil Type Ring Main Units, cables etc. BEST has included these items / Sub-items in the RDSS DPR.

(D) Separate Sheet for RSS, DSS, HV/LV Cables, HT/LT switchgears in the form of approved Vs proposed to be submitted:

1. **RSS Items**: The details for RSS items such as Replacement of T/Fs, 33 kV & 11 kV switchgears is given in the following Table-A:

TABLE-A : Approved Vs Proposed in the DPR (RSS items - T/Fs, 33 kV & 11 kV switchgears)					
Sr. No.	**MERC Approved Reference with date**	**Approved cost of DPR**	**Scope of work**	**Approved Cost (in Cr)**	**Proposed Cost in DPR**
I	**Replacement of T/F and associated equipments at RSS**				
1	MERC/TECH V/CAP / DPR /20122 013 /02688 dated 22.02.2013	36.63 Cr	Kussara & Mazgaon Dock (1 No. each), Mahalaxmi (2 Nos.) (Qty-4)	5.96 Cr	11.04
2	MERC/Capex/2022-23/ 0556 dated 14.11.2022	56.07 Cr	Sitaladevi (Qty-1 No.)	1.54 Cr.	2.76
3	MERC/Capex/2017-18/4706 dated 16.11.2017	58.86 Cr	Sewree (2 Nos.)	2.82	5.52
4	MERC/Capex/2019-20/135 dated 10.05.2019	15.58 Cr	Naval Dock (1 No.) (Note: Only T/F Cost)	NIL	2.84
II)	**Replacement of 33 kV Switchgears at RSS**				
1	MERC/TECH V/ CAP /DPR /2012 2013 / 02688 dated22.02.2013	36.63 Cr	Mumbadevi (2 Nos.) & Masjid 1 No.) (Qty- 3 Nos.) ***Refer Para 2.4, Pg. No. 38-39.***	0.39	0.77
2	MERC/Capex/2017-18/4706 dated	64.09 Cr	KEM (Qty-1 No.) ***Refer Para 2.4, Pg. No. 38-39.***	0.10	0.26
3	MERC/Capex/2017-18/4706 dated 16.11.2017	58.86 Cr	Ballard Estate (Qty-1 No.) ***Refer Para 2.4, Pg. No. 38-39.***	0.10	0.26
4	MERC/Capex/2020-21/553 dated 15.12.2021	40.60 Cr	Mazgaon Dock, Colaba (1 No. each), & Kingsway, Mahim (2 Nos. each) (QTY-6) ***Refer Para 2.4, Pg. No. 38-39.***	1.35	1.55
III)	**Replacement of 11 kV Bus Sections (10 Panels) at RSS**				
1	MERC/Capex/2017-18/ 4706 dated16.11.2017	64.09 Cr	Mahim Causeway (2 Nos.) & Esplanade (3 Nos.) (Qty-5) ***Refer Para 1.4, Pg. No. 46.***	2.15	5.86
		58.86 Cr	Mahim (2 Nos. & Malabar Hill (1 No.) ***Refer Para 2.4, Pg. No. 45.***	1.29	3.52
2	MERC/Capex/2020-21/553 dated 15.12.2021	40.60 Cr	Nair Hosp, KEM (1 No. each), Sewree, Dharavi, Prabhadevi, Wadala, Mahim, Mahalaxmi and Worli (2 Nos. each) and Grant Road (4 Nos.) (Qty-20). ***Refer Para 2.4, Pg. No. 45.***	8.79	23.44
IV)	**Replacement of 33 kV, 3CX300 SQ. MM Cu XLPE cable**				
1	MERC/Capex/2017-18/ 4706 dated16.11.2017	64.09 Cr	L.T. Marg from Metro Junction to Mohd. Ali Rd for G. T. Hosp, Esplanade, Girgaum, Malabar Hill, Marine Drive, cable on Apollo RSS (Qty-22km)	22	62.48
2	MERC/Capex/2017-18/ 4706 dated16.11.2017	58.86 Cr	Hutatma Chowk, Marine Drive, G T Hospital, Colaba, Naval Dock, Ballard Estate (Qty-29.26 km)	29.26	83.09
3	MERC/Capex/2022-23/ 0556 dated 14.11.2022	56.07 Cr	1. TPC Parel RS to Marathon Future (5.722 Km) 2. Part portion of Cumbala Hill T/F 1,2 & 3 (5.5 km), 3) Sitaladevi T/F 1,2,3 &4 (2.210 km), 4) DBA to Futurex , Parel to Futurex (3.420 km) (Qty-16.90 km)	24.66	47.99

2. **DSS items**: Please kindly note that for DSS items such as replacement of DTs, Oil Type switchgears/RMUs and HV and LV cables; there is 'No duplication'. Because, for RDSS work BEST has identified the schemes and handed over to the PIA. Further to this, for identification purpose Separate Location Codes are also allotted for all schemes which are to be executed under RDSS. These Location Codes are intimated to the Executing Agencies (PIA).

Data Gap No.4: Cost benefits analysis in line with MTR Order to be submitted.

Reply: The submitted CBA was also in line with latest MTR Order 212 of 2022 dated 31.03.2023. Now, the Cost of total DPR is revised due to due to revision in RI Charges, Revision in cost of ADMS and deletion of MDM part from the DPR.

The benefits of the capital expenditure proposed to be incurred under the RDSS may be divided into two parts; namely- Tangible benefits and Intangible benefits.

The capital expenses basically made for Implementation of following RDSS projects does not directly contribute to increase sale of power. However, these expenses too are necessary for reliable supply of power in the long run and hence have been included in the cost benefit analysis (CBA).

i. Auxiliary components for Smart Metering Project
ii. ADMS and
iii. ERP, Software billing & IT/OT enablement works

The benefit of the augmentation will accrue for the entire life of the equipment installed; they have been projected for a period of five years only.

1. **Benefits of Auxiliary Components for Smart Metering**: Replacement of existing meter boards with refurbished Meter Boards of various sizes with facility of installation of Single / Three Phase Meter, Wire and 40/63/100 Amps MCB would help in installation of Smart Meters in BEST resulting following benefits/objectives:

   - By connecting new meters to release new load will increase revenue.
   - Availability of information and online services.
   - Improved Billing and Billing Accuracy.
   - Improved billing Accuracy.
   - Higher reliability of the system.
   - Elimination of manual meter reading
   - Outage Management and real time data.
   - Remotely Connect and Disconnection of meters

2. **Benefits of ADMS:**

   After installation & commissioning of ADMS, BEST will be able to achieve the Following Benefits:

Real time monitoring: All electrical parameters like voltage, current, power factor, power transformer tap and loading etc. of the RSS, Strategic DSS are monitored on real time basis.

On-line control: The switchgears are operated on-line for switching and load transfers. The power factor of the DSS/RSS is monitored by on-line operation of the Capacitors. OLTCs are operated / monitored on-line to regulate the voltage profile.

Archiving of data: All above electrical parameters are archived at 10 to 15 min. interval. Report generation of archived data is utilized for various purposes like DMS, load forecasting, preparation of Equipment Maintenance Schedules of RSS/DSS, etc.

Reduction of Skilled manpower at RSS: After implementation of ADMS in BEST, all the operations at RSS/DSS are to be carried out from the MCC, BCC remotely. Subsequently, the requirement of manning RSS by skilled officer at every 33/22 kV RSS will be reduced resulting saving cost on manpower. However, the proposed skilled manpower at 110kV RSS will be remain unchanged by considering the importance and voltage level of RSS.

Reduction in fault isolation time and restoration time and average interruption time will be reduced.

Other benefits are as follows:

- Better quality of supply.
- Reduction in revenue loss.
- Efforts in travelling of Fault Engineer & its crew are minimized.
- Load forecasting & useful for future network system design.
- Increase in life of electrical equipments.
- Safety of operation staff enhances.
- Useful in Disastrous conditions like flooding, earthquake, etc
- Useful in festivals like Ganesh Utsav, Diwali, etc.
- System generated SOP parameters

3. **Benefits of ERP, Billing Software and IT/OT enablement works**

Though there is no direct tangible cost benefit, however, Implementation of ERP, Billing Software and IT/OT Enablement work envisaged under RDSS scheme will help BEST to achieve the objective of increasing productivity of its Human Resources. It also, gives following benefits:

- Strengthen the availability and responsiveness of existing online applications by having appropriate hardware & software resources and its integration.
- Strengthen agility, scalability, multi-tenancy, governance of its IT applications and maintain these for a foreseeable future.

- Utilization of the modern technologies such as Cloud Computing consisting of Compute, Storage and software to improve the scalability, availability, maintainability & performance of IT based systems.

4. **Benefits due to replacement of age old switchgears (RSS &DSS), RMUs (DSS):-**

   Tangible benefits can be achieved by replacement of age old equipments such as 33 kV and 11 kV (350MVA) switchgears, 11 kV Oil Type Switchgears (250 MVA) / RMUs, etc. Due to reduction in off supply period, considerable amount of cost will be saved. Further to this, it will improve reliability and quality of power supply.

5. **Tangible Benefits due to replacement of old Power Transformers with New Power Transformers**:

   Under RDSS, total 18 Nos. of T/Fs are proposed to be replaced. Existing old T/Fs were procured with total 63 kW (NLL- 9 kW & TL - 63 kW) losses. However, these losses are now reduced to 52.50 kW (NLL- 8.5 kW & TL – 52.50 kW) from 63 kW, because of which there is net saving of 10.50 kW. Yearly about 26,83,843.20 units will be saved costing of Rs. 2.10 Cr. ***For detail calculation, kindly refer Annexure-CO, Pg. No.1.***

   Please note that due to ageing losses of the T/Fs are increased. Current losses of T/Fs are more than 15% of initial losses (Losses at the time of installation). While calculating the losses, existing losses due to ageing are not considered.

6. **Tangible Benefits due to replacement of age old 33 kV, 11 kV and 1.1 kV cables:**

   Please note that existing PILC/XLPE cables are more than 30 years old & having number of joints resulting increase in **I^2R loss**. It is estimated that about **Rs. 12.02 Cr** (33 kV cable, 100 kM, Rs. 0.53 Cr, 11 kV cable, 200 kM, Rs. 9.99 Cr & 1.1 kV cable, 50 kM, Rs. 1.50 Cr) cost will be saved against up-gradation HV & LV cables under RDSS. ***For detail calculation, kindly refer Annexure-CP.***

7. **Tangible Benefits due to replacement of age old DTs (666 Nos.):**

7.1 We have tested 2 Nos. of DTs of same rating i.e. 630 kVA; it is found that losses of DTs are increased by 39% to 40% of the losses at the time of purchase. ***For details, kindly refer Annexure-CQ, Pg. No.1.***

7.2 For loss estimation purpose, it is assumed that 39% losses of each DT is increased as against the total losses at the time of purchase.

7.3 Please note that existing Dry Type and ONAN Type DTs are more than 30 years old. It is estimated that about Rs. 23.21 Cr (ONAN Type DT -21.94 Cr & Dry Type DT -1.27 Cr) cost will be saved against up-gradation/replacement of 666 Nos. of DTs under RDSS. ***For detail calculation, kindly refer Annexure-CQ, Pg. No.2/C to 3/C.***

8. Due to replacement of 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA and upgrading the voltage level from 22 kV to 33 kV, there will be substantial reduction in distribution losses. ***Kindly refer Annexure-BD.***

Revenue due to additional sales

RSS Capacity Addition

i. Additional T/Fs = 2X16 MVA
ii. Replacement 11X10 MVA to 11X16 MVA = 66 MVA Addition
iii. Replacement 6X15 MVA to 6X16 MVA = 6 MVA

DSS Capacity Addition

Replacement 3X1000 kVA to 3X1600 kVA = 1.8 MVA Addition

Table MVA Capacity addition

Sr. No.	Particulars	Units	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27
1	Capacity added	MVA	16.60	70.60	18.60	-
2	Average P. Factor	--	0.9900	0.9900	0.9900	0.9900
3	RoE/ unit	Rs./Unit	0.3013	0.2961	0.2961	0.2961

Calculations of RoE for FY 2023-24 (Case No.212 of 2022 dtd.31.03.2023)

Return on Equity for FY2023-24= Rs.143.82 Cr) Refer ---Annexure-BE, Pg No.7/C
Distribution Loss = 4.18% ---- Annexure-BE Pg No.4/C
Energy sale = 4772.81 Mus. --- Annexure-BE Page No.4/C
R0E per unit = $143.82 \times 10^7 / 4772.81 \times 10^6 = 0.3013$

Calculations of RoE for FY 2024-25 (Case No.212 of 2022 dtd.31.03.2023)

Return on Equity for FY24-25= Rs.148.72 Cr) Refer --- Annexure-BE, Pg. No. 7/C.
Distribution Loss = 4.18% ------- Annexure-BE Page No. 4/C
Energy sale = 5023.20 Mus. ------ Annexure-BE Page No. 4/C
R0E per unit = $148.72 \times 10^7 / 5023.20 \times 10^6 = 0.2961$

For calculation of RoE per unit, the values of RoE, Distribution Loss, and Energy Sales are taken from ***MERC Order Case No. Case No.212 of 2022 dtd.31.03.2023 and same is enclosed as Annexure –BE.***

Projections for the additional revenue accrued due to potential additional sales for a period of Five Years is given below:

Table- Calculation of revenue from additional sales

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Capacity Addition (MVA)	16.60	70.60	18.60	-	-
Cumulative capacity Added (MVA)	16.60	87.20	105.80	105.80	105.80
Incremental loading	20%	30%	40%	50%	60.04%
Distribution losses	4.18%	4.18 %	4.18 %	4.18 %	4.18 %
System power factor	0.9900	0.9900	0.9900	0.9900	0.9900
Additional sales (MU)	27.59	158.72	262.09	350.01	437.99
RoE per Unit (Rs/ unit)	0.3013	0.2961	0.2961	0.2961	0.2961
Total revenue (Rs. Crore)	0.83	4.70	7.76	10.36	12.97

For estimation of additional MUs saleable, only incremental loading of the RSS has been considered. It is assumed that in the first year of commissioning, a new transformer shall be loaded to the extent of 20%, in the 2nd year at 30%, in the third year at 40%, in the 4th year at 50% and finally in the fifth year at 60.04% or equivalent to the average load factor of the system. The load factors for each year shown in the table above are the weighted average of the transformer capacity and their incremental loading for that year.

A sample calculation for estimating the additional units sold is given below:

No. of units realized in FY 2023-24

= Load * Power Factor * Incremental load * No. of hours per day * No. of days * (1- Distr. Loss) / 10^6

= 16.60 * 0.9900 * 20% * 24 * 365 * 1000 * (1-4.18%)/10^6 = 27.59 MUs

Based on the above calculations the total benefit that can be accrued from the proposed capital expenditure under this scheme is as below:

Table: Benefits from RSS project schemes **Amount in Cr.**

Particulars	FY 23-24	FY 24-25	FY 25-26	FY 26-27	FY 27-28
Revenue due to additional sales	0.83	4.70	7.76	10.36	12.97
Revenue realized	0.83	4.70	7.76	10.36	12.97

For Revenue calculation, kindly refer Annexure-BF.

Intangible Benefits

1. The replacement of old age cables help in meeting increasing load in its area of installation and to improve quality and reliability of supply.

2. In addition to above replacement of outlived Switchgears & Transformers with New Switchgears & Transformers, the scheme will enhance the safety and also reduce supply interruptions and thus will generate additional revenues.

Summary of the Benefits /Savings due to up-gradation of Distribution Infrastructure:

Amount in Cr.

Sr. No.	Particulars	FY 23-24	FY 24-25	FY 25-26
1.	Replacement of Power Transformers	2.10	2.10	2.10
2.	Replacement of 33kV, 11 kV & 1.1 kV cables	12.02	12.02	12.02
3.	Augmentation of RSS & DSS	0.83	4.70	7.76
4.	Replacement of age old DTs	23.21	23.21	23.21
	GRAND TOTAL SAVING in Cr.	**38.16**	**42.03**	**45.09**

Data Gap No.5: Reliability indices for last five years to be submitted.

Reply: Reliability Indices for last five years (April to March) are given in the following Table and Reliability Indices are also available on BEST's website.

Sr. No.	Particulars	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1	SAIFI	73.97	71.86	62.99	70.56	67.71
2	SAIDI	2.91	2.88	2.63	2.75	2.32
3	KAIDI	25.42	24.94	23.92	25.67	29.17
4	HV Consumer (KAIDI)	-	-	-	26.59	29.34

Data Gap No.6: Whether competitive bidding carried out before placing LOI to the respective Agencies?

Reply: Yes, for awarding contract to respective Agencies, competitive bidding was carried out (As per MERC Capex regulation, 2022, Appendix-3). Also, for most of tenders for getting better response from vendors, extensions in bid opening dates were allowed.

RSS ITEMS:

- **Data Gap No.1:** Currently how many transformers are installed at Pratiksha Nagar RSS? What is the current loading? Substantiate the demand in the area with the documentary proof. Justify the installation of additional transformer in respect of cost and load as compared to feeding the additional load from nearby RSS such as Sion Fort, Lodha Crown etc when the current loading of transformer at Pratiksha Nagar is 30%. Submit copy of STU application.

  Reply: **A). Transformers Installed at Pratiksha Nagar RSS**: It is 3 T/F RSS and at present, 1X16 MVA, 33/11 kV T/F is installed under IPDS on 03.02.2020.

  B). Current Loading of T/F: At present T/F is loaded about 30%.

  C). Demand in the area with the documentary proof:

  (i) Vide mail dated 28.12.2022, Dy.CM (OP-South) has informed that M/s Chalo had been started their operation of premium AC Service buses from Anik Depot by using **760 kW** load supplied by BEST (***kindly refer Annexure-BH, Load Application, Pg. No.17***) and they have already applied for additional **2250 kW** load at Anik Depot on 28.11.2022 (***kindly refer Annexure-BI, Load Application, Pg. No. 8***). Further to this, Chalo Mobility Pvt. Ltd and Sargo Overseas Pvt Ltd. has applied for **2250 kW** and **30 kW** load and BEST has sanctioned the load (***kindly refer Annexure-BJ, Load Application, Pg. No. 49 & Annexure-BG, Load Application, Pg. No. 9 respectively***).

  (ii) Vide said mail, Dy.CM (OP-South) further informed that there is additional 15.50 MW load requirement for EV charging. This load will be required in near future on urgent basis. ***For Details of load requirement at Depots, kindly refer Annexure-BK, Pg. No. 1-2.***

D). Installation of additional transformer in respect of cost and load as compared to feeding the additional load from nearby RSS such as Sion Fort, Lodha Crown etc when the current loading of transformer at Pratiksha Nagar is 30%:-

1. Present Peak Loading of Pratiksha Nagar, Sion Fort and Lodha Crown RSS is given in the following table.

Sr. No.	Name of RSS	Tr. No	Primary Voltage (in kV)	Existing Installed Capacity (in MVA)	PEAK Load (in Amp)	Existing Load (in MVA)	% Loading
1	SION FORT	1	33	16	135	7.72	48
		2	33	16	145	8.29	52
2	Pratiksha Nagar	1	33	16	88	5.03	31
3	LODHA CROWN	1	33	16	136	7.77	49

2. From the above table, it is seen that at Sion Fort RSS there is about 30% spare capacity available on each T/F, Further to this, there is 50% and 30 % spare capacity available on the T/Fs at Pratiksha Nagar and Lodha Crown RSS respectively. ***For route length of these RSS and SLD at Pratiksha Nagar RSS, kindly refer Annexure-BL.***

3. Justification for releasing Load from Pratiksha Nagar RSS instead of nearby network:

(a) In Near future BEST Transport Division has decided to purchase Electric Charging Buses (instead of Diesel buses) and charging of these Buses, EV Chargers are required to be installed in Depot. Further to this, total 15.50 MW load requirement is also received from Dy.CM (OP-South) vide their e-mail dated 28.12.2022. There is also 3.98 MW additional load requirement from nearby consumers. (***Kindly refer Annexure-BK, Pg. No. 4 & 5).***

(b) The total additional load 19.29 MVA (EV Charging -15.35 MVA and from nearby consumers -3.94 MVA), can be released either by **(Option-1)** installing additional T/F at Pratiksha Nagar RSS or **(Option -2)** by laying addition 11 kV cables from nearby Lodha Crown RSS or **(Option -3)** by laying addition 11 kV cables from nearby Sion Fort RSS.

Laying of additional 11 kV cable involves, the costing of 11 kV cable and associated material like, HT Tiles, St. Joint kits, HDPE Pipes, Termination kits, Switchgears, Way Leave Charges to Harbour Line Railway and RI Charges, etc.

Please kindly note that out of 19.29 MVA Load, in either option (option 1 or option-2 or option-3) about 8 MVA load is to be released from Pratiksha Nagar RSS T/F No.1.

Balance 11.29 MVA load can be released either by **(Option-1)** installing additional T/F at Pratiksha Nagar RSS or **(Option -2)** by laying addition 11 kV cables from nearby Lodha Crown RSS or **(Option -3)** by laying addition 11 kV cables from nearby Sion Fort RSS.

Common costing for each option: Cost estimate for releasing 8 MVA load from Pratiksha Nagar RSS T/F No.1

No. of 11 kV cables required to be laid from Pratiksha Nagar RSS T/F No.1 up to Load Center:-

Current Carrying Capacity of 1X3CX240 sq.mm Al XLPE cable = 327 Amp (in Air)

It is assumed that cable is carrying safely 180 Amp current continuously.

Average system P.F is 0.99

8 MVA = 11kV* I (KA)* 0.99

I (Amp) = 8 000 kVA/ (11kV*0.99) = 8000 kVA/10.89 kV = 734.62 Amp

No. of 3CX240 sq.mm cables required = 734.62/180 =4.08 = 4

For releasing about 8 MVA load total 4X3CX240 sq.mm able is required to be laid from Pratiksha Nagar RSS up to Load Center. The Load center is about 500 Mtr away from this RSS. The estimated cost with RI charges for laying 4 Nos. of cables is given in the following table.

Sr. No.	3CX240 sq. mm cable to be laid from To	Unit	Total Qty	Per KM laying Cost (in Cr.)	Total Cost (in Cr.)
A	**B**	**C**	**D**	**E**	**F =D*E**
1.	PN RSS to Load Center	KM	4X0.500	0.2234	0.45
2.	RI Cost in Rs.	KM	1X0.500	1.18.47	0.59
3.	**Total Cost in Cr.**		**-**	**-**	**1.04**

Please kindly note that total cost of Rs.1.04 Cr is not considered in the DPR. This cost is to be added in the "HV & LV network and Associated equipments" Approved DPR (MERC Reference Letter No. MERC/CAPEX /2021-22/552 dated 15th December, 2021). This is HV cable strengthening work for EV Charging and same need not be included in the RDSS DPR.

Option 1: **To meet the total Load Requirement of 19.29 MVA (EV Charging-15.35 MVA + Consumer -3.94 MVA) by installing additional T/F at Pratiksha Nagar RSS:**

Out of 19.29 MVA Load, 8 MVA load is proposed to be released from Pratiksha Nagar RSS T/F No.1 and cost estimate of the same is Rs. 1.04 Cr.

No. of 11 kV cables to be laid from Pratiksha Nagar RSS T/F No.2:-

It is proposed to release 11.29 MVA load from Pratiksha Nagar T/F No.2.

11.29 MVA = 11kV*I (KA)* 0.99

I = 11.29 MVA/ (11kV*0.99) = 11290 kVA/10.89 kV = 1036.73 Amp

No. of 3CX240 sq.mm cables required = 1036.73/180 =5.75 = 6

For releasing about 11.29 MVA load total 6X3CX240 sq.mm cable are required to be laid from Pratiksha Nagar RSS up to Load Center. The Load center is about 500 Mtr away from this RSS. The estimated cost with RI cost for laying 6 Nos. of cables is given in the following table.

Sr. No.	3CX240 sq. mm cable to be laid from To	Unit	Total Qty	Per KM laying Cost (in Cr.)	Total Cost (in Cr.)
A	B	C	D	E	F =D*E
1.	PN RSS to Load Center	KM	6X0.500	0.2234	0.67
2.	RI Cost in Rs.	KM	1X0.500	1.1847	0.59
3.	**Total Cost in Cr.**		**-**	**-**	**1.26**

Total cost required for releasing additional Load from Pratiksha Nagar RSS = Total Commissioning cost of T/F No.2 at RSS + total cost incurred on laying of 11 Kv cable and accessories from PN T/F No. 1 & 2 up to load center.

Total cost for installation of additional T/F at RSS is Rs. 4.32 Cr. For ***Cost Sheet, kindly refer Annexure-BM, Pg. No.1.***

Total cost estimate for releasing additional Load = Rs. 4.32 Cr. + **Rs. 1.04**+ Rs.1.26
= Rs. 6.62 Cr.

Please kindly note that total cost of Rs. 2.30 Cr. (11 Kv cable laying estimate, from T.F No.1, Rs.1.04 Cr and from T/F No. 2, Rs.1.26 Cr.) is not considered in the DPR. This cost is to be added in the "HV & LV network and Associated equipments" Approved DPR (MERC Reference Letter No. MERC/CAPEX /2021-22/552 dated 15th December, 2021). This is HV cable strengthening work for EV Charging and same need not be included in the RDSS DPR.

Net cost required to be releasing Load by Option is Rs.4.32 Cr.

Option 2: Meeting 19.29 MVA load requirement by laying 11 Kv cables from Lodha Crown RSS.

Out of 19.29 MVA Load, 8 MVA load is proposed to be released from Pratiksha Nagar RSS T/F No.1 and cost estimate of the same is Rs. 1.04 Cr.

11.29 MVA Load can be released by laying 6X3CX240 sq.mm cable from Lodha Crown RSS:–

Lodha Crown is 2XT/F RSS and at present having 1X16 MVA, 33/11 Kv T/F. Feeder Nos. are as follows:

Lodha Crown Tr. & Feeder No.	Feeder Name	Sion Fort Tr. & Feeder No.	Feeder Name
Tr. No. 1	**Primary**	**Tr. No. 1**	**Primary**
LC 1.1	Kokari Camp No.1 DSS	SF1.1	Capacitor no. 1
LC 1.2	Enchant DSS No.6	SF1.2	New Sion East
LC 1.3	Lodha House Bldg. DSS No.13	SF1.3	Sion Circle
LC 1.4	Lodha Elesium DSS No.7	SF1.4	**Spare**
LC 1.5	Enchant DSS No.5	SF1.5	Vallabhadas Marg
LC 1.6	Wadala Casting Yard	SF1.6	Sion Fort DSS
LC 1.7	**Spare**	SF1.7	Air Force Qtrs.
LC 1.8	Spare for Capacitor No.1	-	-
BC 1-2	**Bus Coupler**	**BC 1-2**	**Bus Coupler**
Tr. No. 2	Primary	**Tr. No. 2**	Primary

BC 2-1	**Bus Coupler**	BC2-1	**Bus Coupler**
LC 2.1	Car Road S/S	SF2.1	Boots Drugs
LC 2.2	Adarsh Gharkul DSS	SF2.2	Metal Factory
LC 2.3	Lodha Commercial Tower DSS	SF2.3	Mun. Sion Industries
LC 2.4	Lodha DSS No.9	SF2.4	**Spare**
LC 2.5	Lodha Crown No.15	SF2.5	Angan Apartment
LC 2.6	Raoli Hill Static S/S	SF2.6	Sion Rly. Qtrs.
LC 2.7	**Spare**	SF2.7	Capacitor no. 2
LC 2.8	Spare for Capacitor No.2	-	-

It is assumed that 1X3CX240sq. mm. cable carrying 180 Amp current.

Total current flowing through 11 kV for 11.29 MVA) = 11.29 MVA/ (11 kV*0.99)

I =11290kVA/10.89 kV =1036.73A

No. of HV cables required to be laid from nearby network **= I/180 =1037/180 =5.76 =6**

For releasing 11.29 MVA load about 6 Nos. of 11 kV, 3CX240 sq.mm cables are to be laid from Lodha Crown RSS.

Total costing for laying 6 Nos. of 11 kV cables from Lodha Crown RSS up to Load center is given in the following Table.

Sr. No.	3CX240 sq. mm cable to be laid from To	Unit	Total Qty	Per KM laying Cost (in Cr.)	Total Cost (in Cr.)
A	**B**	**C**	**D**	**E**	**F =D*E**
1.	Lodha Crown to Load Center	KM	2X1.734	0.2234	0.77
2.	RI Charges	KM	1X1.734	1.1847	2.05
3.	DSS to Load Center	KM	4X1.870	0.2234	1.67
4.	RI Charges	KM	4X0.136	1.1847	0.64
3.	**Total Cost in Cr.**		**-**	**-**	**5.13**

Total length from Lodha Crown RSS up to Load Center = 1.734 Km, ***kindly refer Annexure-BL for route length. For Per KM RI cost and cable laying cost, kindly refer Annexure-CS, Pg. No.6.***

Total cost required for releasing additional Load = Total cost incurred on laying of 11 kV cable and accessories from (i) Pratiksha Nagar T/F No. 1, (ii) Lodha Crown RSS (2 cables) and nearby DSS of Lodha Crown RSS (4 cables) up to Load Center.

Total cost proposed for releasing additional Load (in Cr.) = Rs. 1.04 + Rs. 5.13

= Rs.6.17 Cr

Please kindly note that total cost of Rs. 1.04 Cr. (11 kV cable laying estimate, from T.F No.1, Rs.1.04 Cr) is not considered in the DPR. This cost is to be added in the "HV & LV network and Associated equipments" Approved DPR (MERC Reference Letter No. MERC/CAPEX /2021-22/552 dated 15th December, 2021). This is HV cable strengthening work for EV Charging and same need not be included in the RDSS DPR.

Net cost required to be releasing Load by Option is Rs. 5.13 Cr.

Option 3: Part-C: 11.29 MVA Load can be released by laying 6X3CX240 sq.mm cable from Sion Fort RSS: –

Out of 19.29 MVA Load, about 8 MVA load is proposed to be released from Pratiksha Nagar RSS T/F No.1 and cost estimate of the same is Rs. 1.04 Cr.

T/Fs at Sion Fort are loaded about 50% each and about 30 % Load can be released from each T/F for EV Charging. However, by considering T/F capacity, 9.60 MVA (2X4.8 MVA) additional load can be released from Sion Fort network.

For releasing 11.29 MVA load about 6 Nos. of 11 kV, 3CX240 sq.mm cables are to be laid from Sion Fort RSS.

Total costing for laying 6 Nos. of 11 kV cables from Sion Fort RSS Network up to Load center is given in the following Table.

Sr. No.	3CX240 sq. mm cable laid From To	Unit	Total Length	Unit Cost (in Cr.)	Total Cost (in Cr.)
A	B	C	D	E	F =D*E
1.	Sommaya College to Load Center	KM	0.564	0.2234	0.13
2.	Sion Tel Exchange to Load Center	KM	1.920	0.2234	0.43
3.	Raheja Residency to Load Center	KM	1.770	0.2234	0.40
4.	SF2.4 to Load Center	KM	2.230	0.2234	0.50
5.	Boot s Drug to Load Center	KM	2.064	0.2234	0.46
6.	SF1.4 to Load Center	KM	2.230	0.2234	0.50
7.	R.I Charges	KM	**3.238**	1.1847	3.84
8.	No. of Switchgears required	Nos.	4	0.0477	0.19
	Total Cost in Cr.				**6.45**

Common Excavation =1.770 KM, Total Excavation = 0.564+**0.15+1.770+0.46+0.294 =3.238 KM,** ***for cable route of Lodha Crown & Sion Fort RSS, kindly refer Annexure-BM, Pg. No.2. Also, for 11 kV radial networks, kindly refer Annexure-BM, Pg. No.3.***
Total cost required for releasing additional Load = Total cost incurred on laying of 11 kV cable and accessories from (i) Pratiksha Nagar T/F No. 1, (ii) Lodha Crown RSS (2 cables) and nearby DSS of Lodha Crown RSS (4 cables) up to Load Center.

Total cost proposed for releasing additional Load (in Cr.) = Rs. 1.04 + Rs. 6.45
= Rs.6.45 Cr

Please kindly note that total cost of Rs. 1.04 Cr. (11 kV cable laying estimate, from T.F No.1, Rs.1.04 Cr) is not considered in the DPR. This cost is to be added in the "HV & LV network and Associated equipments" Approved DPR (MERC Reference Letter No. MERC/CAPEX /2021-22/552 dated 15th December, 2021). This is HV cable strengthening work for EV Charging and same need not be included in the RDSS DPR.

Net cost required to be releasing Load by Option is Rs. 6.45 Cr.

Cost comparative of Option -1, Option -2 & Option -3

Option No.	Capital Expenditure (in Cr.)			Total CAPEX (in Cr.)	Cable Length (in KM)	Losses (in kW)	Economical Option
	PN T/F No.2	8 MVA	11.29 MVA				
A	B	C	D	E	F	G	H
1	4.32	1.04	1.26	**6.62**	3.00	**23.43**	**1**
2	-	1.04	6.17	**7.21**	10.95	**85.52**	**-**
3	-	1.04	6.45	**7.49**	10.78	**84.19**	**-**

Per KM cable Losses = 7.81 kW

In view of above, Option No.1 is more economical as compared with Option No. 2 & Option No.3. For more clarity, reasons / drawbacks of Option-2 & Option-3 are mentioned below:

Drawbacks of Option-2:-

1. At Lodha Crown RSS, 1X16 MVA, 33/11 kV T/F is installed, in contingency point of view, it is essential to install T/F No. 2 at Lodha Crown RSS. On 2 Nos. of 11 kV bus Sections, only 2 Nos. of spare breakers are available for laying additional cable.
2. At nearby DSS No additional Space is available for installation of additional switchgears for laying 4 Nos. of 11 kV cables which are proposed in the above estimation.
3. Load Center is far away from Lodha Crown RSS. More the cable length (about 10.95 KM), losses will be more, RI cost will be more and ultimately maintenance cost will be more which is not economical.
4. For execution of this scheme, about Rs. 6.17 Cr. Capital expenditure is required to be made.
5. Due to this, in future additional load demand from this area cannot be fulfilled from Lodha Crown RSS without installing 2nd T/F.
6. In view of above, 2nd Option is not viable, hence not proposed in the DPR.

Drawbacks of Option-3:-

1. At Sion Fort RSS, 2X16 MVA, 33/11 kV T/Fs with 2 Nos. of 11 kV bus Sections are installed. For laying of 11 kV cables directly from Sion Fort RSS 11 kV Bus Section, only 2 Nos. of Spare Breaker are available.
2. At nearby 4 DSS mentioned in the estimation, No additional Space is available for installation of additional switchgears for laying 4 Nos. of 11 kV cables which are proposed in the above estimation.
3. Load Center is far away from Sion Fort RSS or from 4 DSS. More the cable length, losses will be more, RI cost will be more and ultimately maintenance cost will be more.

4. All these 6 nos. of cables are crossing the Harbour Railway Line, hence ‘Way Leave Charges’ are required to be paid to Railway Authority for every 10 years and same is not considered in the above estimation.

5. For Option-3, capital expenditure is about Rs. 6.45 Cr. + Way Leave Charges. This capital Expenditure is more as compared to Option-1 & Option-2.

6. Due to this, in future additional load demand from this area cannot be fulfilled from Sion Fort RSS.

7. In view of above, 3rd Option is also not viable.

Benefits of Option-1:

1. Space for installation of Additional 16 MVA, 33/11 kV T/F is available at RSS.
2. Load Center is very close to the RSS. Hence, required cable length, RI Cost etc. at lower side as compared to Option-2 & Option-3.
3. Due to lesser length of cable, losses are less and maintenance cost is also lower side.
4. For execution of this scheme, capital expenditure required is at lower side as compared to Option-2 & Option-3.
5. Due to less length, future load can also be released from this RSS.

In view of above, Option No.1 is more economical as compared to Option No. 2 & Option No.3, hence Option-1 is considered in the DPR.

E) **STU application Status**: - (1) Vide Application No, PR/Adm.9A (14)/STU/1068/2017 dated 03.04.2017 connection application was made to Chief Engineer STU for allotment of 33 kV outlets to BEST from TPC Mahalaxmi RS & TPC Antop Hill RS.

(2) Accordingly, vide Letter No. MSETCL/CO/STU/Sys/BEST/00919 dated 22.01.2018, Chief Engineer (STU) has allotted 33 kV outlets to BEST from TPC Mahalaxmi RS & TPC Antop Hill RS and ***copy of allotment letter is enclosed as Annexure-BN***.

- **Data Gap No. 2:** The Commission vide letter dated 10.05.2019 has approved installation of Transformer at Naval Dock. Then why it is considered under RDSS. Current status of that DPR including expenditure till date. Submit copy of STU application. What is the current loading of Naval Dock? How it is catered? Justification for additional Transformer? Whether there is increase in demand? If yes, requested to substantiate the same.

Reply: **A) Naval Dock T/F to be installed under RDSS**:

1. We agree, that the additional T/F installation work at Naval Dock RSS is required to be completed before March, 2020. However, due to delay in completion of civil work at Naval Dock RSS, the T/F commissioning work is deferred. The civil work is delayed due to security reasons i.e., strict restrictions imposed on outside personnel entering in the naval premises by the Naval Authority. Because of which, considerable time had elapsed for security check of

contractor personnel before entering in the naval premises each time. The work is also deferred due to EHV cable diversion for MMRC (Mumbai Metro Rail Corporation) as the work was required to be completed urgently. Now, civil work completed.

2. T/F installation work at Naval Dock is also pending due to non-availability of 33/11-6.6 kV D/R T/F. Earlier it was decided to install old 10/12.5 MVA, 22/11-6.6 kV, Sr. No. 90WF-003/6, Kirloskar Make, T/F Manufacturing year 1992 removed from Cumbala Hill RSS. The T/F had been completed their service life of 25 years. Further to this, there was heavy oil leakage observed from LV/HV bushings and OLTC. Then, it was decided 'Not to Install' age old T/F at RSS.

3. In the mean time, Govt. of India has launched the RDSS for strengthening of supply infrastructure for improvement in the quality, reliability, affordability of power supply to consumers, to improve operational efficiencies and to reduce AT&C losses and to reduce ACS-ARR gap to zero by providing financial assistance to DISCOMs. To take benefit of the RDSS for installation of Additional T/F at Naval Dock RSS has been included in the RDSS DPR.

B) Current status of that DPR including expenditure till date: - The DPR is closed on 16.10.2023. For detail Capital Expenditure against approved cost, ***kindly refer Closure Report as Annexure-BC.***

C) STU application Status: - (1) Vide Application No, PR/Adm.9A (14)/STU/196/2023 dated 07.08.2023 connection application was made to Chief Engineer STU for allotment of 3 Nos. of 33 kV outlets to BEST to meet new Load Demand of HT consumer from TPC Carnac RS.

(2) Accordingly, vide Letter No. MSETCL/CO/CE/STU/BEST/6791 dated 25.09.2023, Chief Engineer (STU) has allotted 3 Nos. of 33 kV outlets to BEST from TPC Carnac RS ***and copy of allotment letter is enclosed as Annexure-BO.***

D) Current loading of Naval Dock RSS & How it is catered: -

Current Load of all the T/Fs at Naval Dock RSS is given in the following table:

Tr. No.1	Installed Capacity (MVA)	Current	Base Load		% Loading	Max. Load		% Loading	Spare Cap MVA
			Amp	MVA		Amp.	MVA		
1	10	Before work	108	4.12	41	210	8	80.00	1.60
		After work	-	-	-	-	-	-	
2	10	Before work	95	3.62	36	210	8	80.00	1.37
		After work	-	-	-	-			
3	16	Before work	120	6.86	43	215	8.19	81.93	
		After work	-	-	-	-	-	-	
4	16	Before work	-	-	-	-	-	-	
		After work	-	-	-	157	6.00	60.00	

Catering of Load given below: Existing 22/11-6.6 kV complete feed-in arrangement of Naval Dockyard RSS

Incoming Feeder, Name: TPC CARNAC RS (CND1) to Naval Dockyard RSS Tr. No.1, 10 MVA, Voltage level : 22kV	Outgoing 6.6 kV Feeder Nos. (B.S. No.1)	6.6 kV Outgoing feeders
		I/C 1-3
	1.1	MR 98
	1.2	MR 28
	1.3	MR 11
	1.4	MR 66
	1.5	MR 83
	1.6	Spare
Incoming Feeder, Name: TPC CARNAC RS (CND2) to Naval Dockyard RSS Tr. No.2 , 10 MVA Voltage level : 22kV	**Outgoing 6.6 kV Feeder Nos. (B.S. No.2)**	**6.6 kV Outgoing feeder**
		I/C 1-2
	2.1	MR 04
	2.2	MR 40
	2.3	MR 16
	2.4	MR 60
	2.5	MR 75
	2.6	Spare
Incoming Feeder, Name: TPC CARNAC RS (CND3) to Naval Dockyard RSS Tr. No.3, 16 MVA, Voltage level : 33kV	**Outgoing 6.6 kV Feeder Nos. (B.S. No.3)**	**6.6 kV Outgoing feeders**
		I/C 2-3
	3.1	MR 100
	3.2	MR 35
	3.3	MR 06
	3.4	MR 58
	3.5	MR 77
	3.6	Spare
Incoming Feeder, Name: TPC CARNAC RS (CND3) to Naval Dockyard RSS Tr. No.4, 16 MVA, Voltage level : 33 kV	4.1	MR45
	4.2	MR30
	4.3	MR21
	4.4	MR52
	4.5	MR89
	4.6	Spare

For current peak Load and catering of Load at Naval Dock RSS, ***kindly refer Annexure- BP***.

E) Justification for additional Transformer at Naval Dock RSS: -

1. The commissioning work of Naval Dockyard RSS with 3 nos. of power transformers (2x 8 MVA & 1 x 10/12.5 MVA), 22/6.6 kV were take up during 1985-86 and above said power transformers were actually installed in the year 1989. At that time two transformers were on load and third transformer serves as “stand-by” to give reliable and uninterrupted power supply to the consumer.

2. Naval Authority, vide Letter No. DYT/YAS/4151 dtd.15.02.1999, addressed to DGM (Supply) had informed that the existing 22/6.6 kV BEST's Substation was set up during 1985-86 with Max. Capacity of 30 MVA. At that time 2 x 8 MVA transformers were on load and remaining third 1 x 10/12.5 MVA transformer serves as "Standby". This has limitation of max. Power utilization to 80% of 2X8 MVA i.e. approx. 13 MVA only. Further Navy was informed that in the next 2 to 4 years the power requirement of Naval Dockyard RSS expected to increase to 22 MVA and accordingly a case for revision of Max. Contract Demand from existing 17.059 MVA to 25 MVA would be forwarded separately. ***Copy of letter is enclosed as Annexure- 'BQ', Pg. 1 & 2***.

3. 11 kV conversion letter:
BEST vide our Letter No. PR/22kV RSS/ 275/1999 dated 22.03.1999 was informed to the Naval Dock Authority that, BEST has already changed over the entire Electric Supply Network of South Mumbai to 11 kV, except Naval Dock RSS. Because of 6.6 kV network, it's interconnection with the outside 11 kV BEST Network is not possible and as such part of the capacity of the T/F at Naval Dockyard is required to be kept as standby for meeting failures. In spite of these constraints, it is possible to meet the additional load requirement with the existing system by increasing the capacities of the existing power transformers. However, considering the reliability of electric supply, in absence of interconnection with BEST's 11 kV network, it would be worth establishing an additional 33 kV RSS in Naval Dock's premises. ***Copy of letter is enclosed as Annexure 'BQ', Pg. 3 & 4.***

3.1 Further, to this, at that time Naval Dock Authority was informed that the proposal offered by M/s BEST to change over to 11kV distribution system had thoroughly examined and it was concluded that, changeover from 11 kV to 6.6 kV is **not feasible** being **cost prohibitive** for Navy. **The existing 6.6 kV distribution systems should continue**. It was also informed to BEST that, alternative 33kV source of supply from other RSS may be planned for quick restoration of supply and for that existing network of 22/6.6 kV required to be upgraded to 33/6.6 kV to enhance the capacity. For setting up new 11 kV DSS for checking feasibility would be communicated later on. ***Copy of letter is enclosed as Annexure 'BQ', Pg.1 & 2.***

4. In the meantime, considering additional load requirement of Naval Dockyard, 2X8 MVA, 22/6.6 kV T/Fs were replaced by 2 X 10 MVA 22/11-6.6 kV T/Fs on 21.11.2005. **Copy of letter is enclosed as Annexure 'BP' pg. 5 &6.**

4.1 From the year 1999 up to 2009 above said matter is not materialized. Since 2009 BEST was negotiating with the Naval Dockyard authorities for suitable additional space to meet their additional load for their new project of Dry Dock along with Wharves coming up in Naval Dockyard. Later Admiral Superintendent of Naval Dockyard registered the requisition 27976 dated 10.12.2010 for their additional load of 13980 kW at 6.6 kV level. Further, party has revised their load requirement to 10 MVA (8000 kW) with 11 nos. of consumer feeders against 13.980 kW, vide their letter dated 21.03.2013. ***Refer enclosed Annexure 'BQ', pg. 8 to 11.***

4.2 The revised TC No. 110130 dated 21.02.2011was cleared by asking additional space of 8m X 8m admeasuring 64 sq. mtrs. to the existing RSS for installation of 4th T/F. Admiral Supdt. Naval Dockyard had much later registered the new revised requisition 296045 dated 11.04.2017 for the load of 8000 kW (10 MVA) at 6.6 kV voltage level against earlier load requirement 13980 kW. The party has handed over the land admeasuring 73 sq. mtrs. to the BEST on 12.01.2017 for the purpose of construction of additional fourth transformer bay and underground water storage tank with pump house. ***Refer enclosed Annexure 'BQ', Pg. 1 to 5.***

In view of above, for giving uninterrupted power supply to the Naval Authority and it is proposed to install additional 4th T/F at Naval Dock RSS.

F) Whether there is increase in demand? If yes, requested to substantiate the same:-

No, there is no any more demand. However, the T/F is required to be installed for fulfilling earlier load requirement and for contingency. A **copy of Requisition is enclosed as Annexure-BR.**

- **Data Gap No. 3:** In Case of Replacement of 18 Nos. of Power transformers, it is seen that age is the criteria for selection of the same. What is the policy of the BEST for replacement of Power Transformers? What is the life of power transformers in general? Submit Breakdown reports and O&M Expenditure for the last five years on these transformers. Further substantiate the replacement in terms of demand if any. Reasons in the proposal are covered under O&M and not under Capex expenditure.

Reply: **A) In Case of Replacement of 18 Nos. of Power transformers, it is seen that age is the criteria for selection of the same**: - No sir / Madam, BEST has been never replaced or proposed for replacement of T/Fs by considering age factor.

B) Policy of the BEST for replacement of Power Transformers: -

(i) Till date BEST has not replaced Power Transformers (T/Fs) by considering life as criteria. BEST is having various rating of T/Fs in the System which are given below:

- 110/33 kV, 100 MVA
- 33/11 kV, 45 MVA
- 33/11kV, 16 MVA
- 33/11-6.6 kV, 16 MVA
- 22/11 kV, 10-12.5 MVA and
- 22/11-6.6 kV, 10 MVA

(ii) In case of Mill Land development or SRA Project, BEST receives huge load demand from the developer, for fulfilling that much load requirement, as per prevailing practice and Office Order 90 D, BEST either demands space for commissioning of new RSS or installs additional T/F in the existing RSS (if Space is available for installation of additional T/F). If huge load requirement is received in the nearby area of existing 22/11 kV, 10 MVA RSS, the load demand will be fulfilled either by installing additional T/F at existing RSS or by replacing 22/11 kV, 10 MVA T/F with 33/11 kV, 16 MVA T/F i.e. 33 kV changeover.

(i) Now, TPCL has also started up-gradation (22kV to 33 kV changeovers) in the system at TPC Carnac, TPC Parel, TPC Mahalaxmi, and TPC Dharavi. In this case, BEST has also proposed to replace 22/11 kV, 10 MVA T/Fs with 33/11 kV, 16 MVA T/Fs.

(ii) **Scrapping Policy**: - If replaced T/F has completed their useful life of 25 or more then such T/F is scrapped and if replaced T/F having balance life, then such T/F will be re-installed at new location.

C) **Life of power transformers in general: -** As per MYT Regulation, 2019, life of T/F is considered as 25 years and above. Accordingly, BEST is also considers the same.

D) Breakdown reports and O&M Expenditure for the last five years on these transformers:

(i) For Break down reports of the T/Fs under replacement, ***kindly refer Annexure- BT.***

(ii) O&M Expenditure for last five years on all equipments is given in the following table:-

Sr. No.	R & M Expenses	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1	Power / Distribution T/F, Cables (33kV/11kV/1.1kV) , Switchgears (33 kV, 11 kV), etc.	21.03	22.01	9.65	17.38	22.32

BEST has not maintained item wise R&M Expenditure. The R&M expenditure made on Power / Distribution T/F, Cables (33kV/11kV/1.1kV), Switchgears (33 kV, 11 kV), etc. are maintained under “Lines & Cable Networks” head in Books of Accounts. Therefore, item wise R&M Expenses are not available.

E) Substantiate the replacement of T/Fs in terms of demand:-

Most of the developers are reluctant to spare some space for commission of RSS. Moreover, New RSS were also hard to come due to space constraint, we could meet load only by 33kV changeover. For commissioning of new RSS, capital cost on civil structure is required to be made. Also, due to space constraints, there is competition between TPC (D) and BEST for attracting consumer. Therefore, BEST has proposed to replace existing 22/11 kV T/Fs with 33/11 kV, 16 MVA T/Fs at following RSS.

1. Mahalaxmi RSS (T/F No. 1& 3):- From the consumers at Mahalaxmi and Sat Rasta area about 66 requisitions are received having Load requirement of about 34.34 MVA (34 MW) and after replacement of 2X10/12.5 MVA, 22/11 kV T/Fs with 16 MVA, 33/11 kV at Mahalaxmi RSS, only 12 MVA spare capacity will be made available. To fulfill the balance load (22.34 MVA) requirement, space for new RSS at New Dhobhighat is finalized and we are waiting for the approval of CFO for taking over of the site. ***For copy of requisitions, kindly refer Annexure-BU, Pg. No.1-4.***

2. KEM RSS (T/F No. 1) and Sewree (T/F No. 1& 3):- From the consumers of nearby KEM area and Sewree area 18 Nos. and 78 Nos. of requisitions are received having load requirement of 4.36 MVA and 13.70 MVA respectively. Therefore, for meeting the load requirement, it is proposed to replace 3X22/11 kV, 10/12.5 MVA T/Fs with 3X33/11 kV, 16 MVA T/Fs at RSS. ***For copy of requisitions, kindly refer Annexure-BU, pg.5 of 13 & Annexure-L, 6 to 9 of 13.***

3. Kussara (T/F No. 2) and Mazgaon Dock (T/F No. 1):- From the consumers of nearby area, 20 Nos. of requisitions are received having load requirement of 4.44 MVA. Therefore, for meeting the load requirement, it is proposed to replace the existing 22/11 kV, 10/12.5 MVA T/Fs with 33/11 kV, 16 MVA T/Fs at RSS. ***For copy of requisitions, kindly refer Annexure-BU, pg.10 of 13.***

4. Sitaladevi RSS (T/F No. 4): - From the nearby consumers of Sitaladevi area, 58 Nos. of requisitions are received having load requirement of 7.32 MVA. Therefore, for meeting the load requirement, it is proposed to replace 22/11 kV, 10/12.5 MVA T/F with 33/11 kV, 16 MVA T/F at RSS. ***For copy of requisitions, kindly refer Annexure-BU, pg.11 to 13of 13***

F) Reasons in the proposal are covered under O&M and not under Capex expenditure:-

As per MERC/Technical /Capex Regulations, 2022/315, Regulation 3, (g), [replacement of the entire assets after completion of Useful Life and which has gone beyond repair;], the replacement of T/Fs, Switchgears, Cables etc considered under this DPR have already completed their useful life and the assets are beyond repair, hence, the proposed replacement is considered under Capex Expenditure instead of O&M.

Gap No.10: Replacement of 33 KV Switchgear/ 11 KV Switchgear: - Details of previously approved DPRs, Overlapping if any, Reasons for non execution of the same? Is there any duplication? Reasons in Proposal are covered under O&M. Justification for proposing the same under RDSS. Submit Break down reports and O& M expenditure on these switchgears for last five years. Letter from the original manufacturer for obsolete technology if any.

Reply: - (A) Details of previously approved DPRs of 33 KV Switchgear/ 11 KV Switchgear, Overlapping if any.

For details of previously approved DPRs of Power Transformers, 33 KV Switchgears, 11 KV Switchgear and 33 kV cables, ***kindly refer reply of Data Gap No. 3 (B). Also, the reply is reproduced in Annexure-BV & kindly refers the same.***

(B) Reasons for non execution of the same:-

(1) During FY 2019-20, the replacement work of switchgears (33 kV & 11 kV) is deferred due to urgent EHV cable diversion work of MMRC (Mumbai Metro Rail Corporation).

(2) During FY 2020-21& FY 2021-22, the replacement work was not completed in the target scheduled period due to due to COVID -19 and delay in material deliveries from the suppliers.

(C) Is there any duplication:-No, as the items included in the previously approved DPR are deleted from the list of work. These DPRs are closed and for copies of the same, ***kindly refer Annexure-BB and Annexure-BC.***

(D) Reasons in Proposal are covered under O&M: - As per MERC/Technical /Capex Regulations, 2022/315, Regulation 3, (g), [replacement of the entire assets after completion of

Useful Life and which has gone beyond repair;], the replacement of Power / Distribution Transformers considered under this DPR have already completed their useful life and the assets are beyond repair, hence, the proposed replacement is considered under Capex Expenditure instead of O&M.

(E) Justification for proposing the same under RDSS.

1. The Government of India's has launched the RDSS for strengthening of supply infrastructure for improvement in the quality, reliability, affordability of power supply to consumers, to improve operational efficiencies and to reduce AT&C losses and to reduce ACS-ARR gap to zero by providing financial assistance to DISCOMs.

2. To take benefit of the RDSS for strengthening of electrical network by way of replacing age old Power Transformers, DTs, Oil Type switchgears / Oil Type Ring Main Units, cables etc. BEST has included these items / Sub-items in the RDSS DPR.

(F) Submit Break down reports and O& M expenditure on these switchgears for last five years. Letter from the original manufacturer for obsolete technology if any:-

(1) For break down report of 33kV and 11 kV switchgears, ***kindly refer Annexure-BW***.

(2) O&M Expenditure for last five years on all equipments is given in the following table:-

Sr. No.	R & M Expenses	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1	Power / Distribution T/F, Cables (33kV/11kV/1.1kV) , Switchgears (33 kV, 11 kV), etc.	21.03	22.01	9.65	17.38	22.32

BEST has not maintained item wise R&M Expenditure. The R&M expenditure made on all electrical equipments are maintained under "Lines & Cable Networks" head in Books of Accounts. Therefore, separate R&M expenditure on switchgears is not available.

(3) For obsolete technology, a letter from the OEMr is enclosed as ***Annexure-BX.***

- **Data Gap No.5:** Replacement/ Laying of additional 33 kV Cable: - Details of previously approved DPRs, Overlapping if any, Reasons for non execution of the same? Is there any duplication? Excel Sheet showing existing length , proposed length, loss reduction, Number of faults , No of joints, Breakdown history, O& M expenditure, Reliability Indices for last 5 years.

Reply: **(A) Replacement/ Laying of additional 33 kV Cable, details of previously approved DPRs and Overlapping if any**:-

Sr. No.	MERC Approved Reference	Approved cost of DPR	Sanction Date	Scope of work	Approved cost (in Cr)	Capex till date	Current Status
(IV)	**33 kV 3CX300 SQ.MM Cu XLPE cables**						
1.	MERC/TECH V/ CAP/DPR/20122013/ 02688	36.63 Cr	22.02.2013	Replacement of 33 kV cable (Worli RSS, Mahalaxmi RSS, Ballard Estate and Colaba RSS) 6.18 KM	14.46 Cr	-	1. Ballard Estate, Colaba & Mahalaxmi RSS (balance) cables not yet taken for replacement. Proposed to be replaced under RDSS. 2. Cable at Worli RSS and Mahalaxmi (partly) replaced under IPDS and same deleted from this DPR. 3. Now, DPR at Sr. No.1 is closed and for '***Closure Report' kindly refers, Annexure –BB.***
2.	MERC/Capex/2017-18/4706	64.09 Cr	16.11.2017	33 kV cable replacements on L T Marg from Metro Junction to Mohd. Ali Rd., for G T Hospital, Esplanade, Girgaum, Malabar Hill, Marine Drive, cable on Apollo Bunder and diversion of KEM & Kingsway RSS, TPC Mahalaxmi to Prabhadevi RSS (32.59 KM).	32.59	0.82+3.24	1. DPR at Sr. No. 2, diversion of 33 kV cable at KEM & Kingsway RSS is completed under this DPR. .Hence, not taken under RDSS. 2. Partly cable laid under IPDS at Junction of L T Marg for G T Hospital, Esplanade RSS etc. hence this part is deleted from this DPR. 3. Balance cable is to be replaced under RDSS, hence deleted from this DPR. 4. After approval of RDSS DPR this DPR will be closed.
		58.86 Cr	16.11.2017	33 kV cable replacements in part of Hutatma Chowk, Marine Drive, G T Hospital, Colaba, Naval Dock, Ballard Estate & Navy Nagar (29.26 kM)	29.26 Cr.	-	
3.	MERC/Capex/2022-23/0556	56.07 Cr	14.11.2022	Diversion & replacement of 33 kV cables of part portion of 33 kV feeders DBA1 to Futures HT Room LHS, DBA2 to Futures HT Room RHS below western Railway Track (3.420 kM).	4.94 Cr	-	1) Cables not yet taken for replacement. Proposed to be replaced under RDSS. It is to be deleted from this DPR.

(B) Reasons for non execution of Schemes: -It is not true that the scheme of cable laying is not executed.

- In the above table, Sr. No.1, 33 kV cable at Worli and Mahalaxmi RSS (partly) is replaced under IPDS and same deleted from this DPR. Now, DPR at Sr. No. 1 is closed.
- In the above table, Sr. No.2, diversion of 33 kV cable at KEM & Kingsway RSS is completed under this DPR. Further to this, partly cable laid under IPDS from the Junction of L T Marg for G T Hospital, Esplanade RSS etc. hence this part is deleted from this DPR.
- During FY 2019-20, the 33 kV cable replacement work was deferred due to urgent EHV cable diversion work of MMRC (Mumbai Metro Rail Corporation).
- During FY 2020-21& FY 2021-22, the 33 kV cable replacement work was not completed in the target scheduled period due to COVID -19 and delay in material deliveries from the suppliers.

(C) Is there any duplication?-Yes. Kindly refer above table for **current status** of previously approved DPRs.

(D) Excel Sheet showing existing length , proposed length, loss reduction, Number of faults, No of joints:-

For Excel Sheet showing existing length, proposed length, loss reduction, Number of faults and No of joints of 33 kV cable, ***kindly refer Annexure-BY***.

(E) Breakdown history, O& M expenditure:-

(1) For break down report of 33kV cables, ***kindly refer Annexure-BZ***

(2) O&M Expenditure for last five years on all equipments is given in the following table:-

Sr. No.	R & M Expenses	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1	Power / Distribution T/F, Cables (33kV/11kV/1.1kV) , Switchgears (33 kV, 11 kV), etc.	21.03	22.01	9.65	17.38	22.32

BEST has not maintained item wise R&M Expenditure. The R&M expenditure made on all electrical equipments are maintained under the head “Lines & Cable Networks” in Books of Accounts. Therefore, separate R&M expenditure on 11 kV cable is not available.

(F) Reliability Indices for last 5 years: Reliability Indices for last five years (April to March) are given in the following Table and Reliability Indices are also available on BEST’s website.

Sr. No.	Particulars	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1	SAIFI	73.97	71.86	62.99	70.56	67.71
2	SAIDI	2.91	2.88	2.63	2.75	2.32
3	KAIDI	25.42	24.94	23.92	25.67	29.17
4	HV Consumer (KAIDI)	-	-	-	26.59	29.34

DSS ITEMS:

- **Data Gap No.1:** In Case of Replacement of 666 Nos. of Distribution transformers, it is seen that age is the criteria for selection of the same. What is the policy of the BEST for replacement of Distribution Transformers (~~Power Transformers~~)? What is the life of Distribution Transformers (~~power transformers~~) in general**?** Submit Breakdown reports and O&M Expenditure for the last five years on these transformers**.** Further substantiate the replacement in terms of demand if any. Reasons in the proposal are covered under O&M and not under Capex expenditure.

Reply: **(A) Replacement of 666 Nos. of DTs, age is criteria for selection of the DTs**: It is true that due to aging DT failure rate is increased. Hence, the DTs who has completed their service life 30 years and above are only proposed for replacement under RDSS. Further to this, while Approving the Loss Reduction DPR, PFC has also considered the same. DT failure data for last 5 years is given in the following Table.

FY	315/400 kVA		630 kVA		995/1000 kVA		1600 kVA		TOTAL
	ONAN	DRY	ONAN	DRY	ONAN	DRY	ONAN	DRY	
2018-19	0	0	11	1	4	0	0	1	**17**
2019-20	1	0	8	3	7	5	0	0	**24**
2020-21	1	0	4	4	5	2	2	0	**18**
2021-22	3	0	16	3	12	1	0	0	**35**
2022-23	1	0	8	3	7	1	4	1	**25**
TOTAL	**6**	**0**	**47**	**14**	**35**	**9**	**6**	**2**	**119**

(B) Policy of the BEST for replacement of Distribution Transformers (DTs): -

(i) Till date BEST has not replaced Distribution Transformers (DTs) by considering useful life criteria. BEST is having various rating of DTs (ONAN & Dry Type) in the System which are given below:

- 11/0.415 kV, 2500 kVA
- 11/0.415 kV, 2000 kVA
- 11/0.415 kV, 1600 kVA
- 11/0.415 kV, 1000/995 kVA
- 11/0.415 kV, 630 kVA and
- 11/0.415 kV, 400/315 kVA

(ii) **Need of replacement of Distribution Transformers (DTs)**:

- The DTs which have completed their service life of 25 years and more than 30 years in service, the DTs have completed their service of 25 years and becomes faulty and the DTs have completed their service of 20 years and become faulty, are to be replaced with new star rated and low losses DTs. The DTs which completed their service of 20 years and become faulty are to be scrapped if repairing of DT is not economical.

- **Policy for replacing DTs with Higher Capacity DTs**: - The augmentation of DSS has been undertaken based on clearances and permits issued by Municipal Corporation of

Greater Mumbai (MCGM) and availability of sufficient space in existing DSS for installation of such equipments. The capacities of DSS are planned to be augmented either by installation of additional DTs or remodeling of DSS or by replacing the DTs with higher capacity DTs.

(C) Life of ~~Power /~~ Distribution Transformer: - As per MYT Regulation, 2019, life of DT is considered as 25 years and above.

(D) Breakdown reports and O&M Expenditure for the last five years:-

(1) For Breakdown Reports of the DTs under replacement is NIL.

(2) O&M Expenditure for last 5 years is on all equipments is given in the following table:-

Sr. No.	R & M Expenses	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1	Power / Distribution T/F, Cables (33kV/11kV/1.1kV) , Switchgears (33 kV, 11 kV), etc.	21.03	22.01	9.65	17.38	22.32

BEST has not maintained item wise R&M Expenditure. The R&M expenditure made on all electrical equipments are maintained under the head "Lines & Cable Networks" in Books of Accounts. Therefore, separate R&M expenditure on 11 kV cable is not available.

(E) Further substantiate the replacement in terms of demand if any:-BEST has proposed to replace 666 Nos. of old DTs having more losses under RDSS and having useful life either 30 years or more. Therefore, about 663 Nos. DTs are to be replaced with same capacity and only 3 Nos. of 1000 kVA DTs are to be replaced with 1600 kVA DTs since these 3 Nos. of DTs are more than 80% loaded.

(F) Reasons in the proposal are covered under O&M and not under Capex expenditure:-

As per MERC/Technical /Capex Regulations, 2022/315, Regulation 3, (g), [replacement of the entire assets after completion of Useful Life and which has gone beyond repair;], the replacement of Power / Distribution Transformers considered under this DPR have already completed their useful life and the assets are beyond repair, hence, the proposed replacement is considered under Capex Expenditure instead of O&M.

- **Data Gap No. 2**: Justification for replacement of SF6 RMUs. Date of installation of these SF6 Units. Breakdown reports? Whether they have outlived their Lives? Total No of OCB in the system. Already approved under DPR, Duplication of work if any.

  Reply: **(A) Justification for replacement of SF6 RMUs**: -

  For integration of SCADA System with Distribution Management System (DMS), Operation Management System (OMS), Field Force Automation (FFA), it is essential to replace SF_6 RMUs which are not compatible for Distribution Automation. There are about 104 Nos. of SF_6

RMUs which has not completed their useful and working satisfactorily in the system, are proposed for replacement because these RMUs are not compatible for Distribution Automation.

(i) After replacement these 104 Nos. of RMUs can be utilized/ installed where Distribution Automation is not proposed or in upcoming new DSS.

(B) Date of installation of these SF6 Units, Breakdown reports and life of RMU:-

For Make, Date of Installation and Life of these SF_6 RMUs and for Breakdown Reports, ***kindly refer Annexure-CA and Annexure-CB respectively.***

© Total No of OCB in the system and: -There are about 565 Nos. of Oil Type Circuit Breakers (OCBs) in the system. ***For list of total OCB, kindly refer Annexure-CD.***

(D) Already approved under DPR, Duplication of work if any:-

Please kindly note that for DSS items such as replacement of DTs, Oil Type switchgears/RMUs and HV and LV cables; there is 'No duplication'. Because, for RDSS work BEST has identified the schemes and handed over to the execution Agency. Further to this, for identification purpose Separate Location Codes are also allotted to each RDSS.

- **Data Gap No.3: Replacement/ Laying of additional 11 Kv Cable**: - Details of previously approved DPRs, Overlapping if any. Reasons for non execution of the same? Is there any duplication? Excel Sheet showing existing length, proposed length, loss reduction, Number of faults, No of joints, Breakdown history, O&M expenditure.

Reply: **(A) Details of Previously approved DPR**: Vide MERC reference Letter No. MERC /CAPEX/2020-21/ dated 22nd June, 2020 the Hon'ble Commission has given in-principle approval for "Laying of HV and LV Cable & Associated equipments for FY 2020-21 to FY 2024-25". The details of the scope of work and cost are given below. ***Copy of the approved DPR is enclosed as Annexure-CE.***

Sr. No.	Item Description	CABLE TYPE	Rs. Crore PER KM	Per Year QTY	FY 20-21	FY 21-22	FY 22-23	FY 23-24	FY 24-25
A	**HV CABLE**		UNIT COST	in KM	**CAPITAL EXPENTITURE (In CRORE)**				
1	Laying of 11 KV HV Cables	AL, XLPE	0.2566	**25.000**	**6.41**	**6.41**	**6.41**	**6.41**	**6.41**
B	**LVCABLE**								
1	Laying of 1.1 KV 4CX300 SQ.MMCABLE	AL, XLPE	0.2061	36.000	7.42	7.42	7.42	7.42	7.42
2	Laying of 1.1 KV 4CX120 SQ.MMCABLE	AL, XLPE	0.1349	5.500	0.74	0.74	0.74	0.74	0.74

3	Laying of 1.1 KV 4CX70 SQ.MM CABLE	AL, XLPE	0.1232	1.000	0.12	0.12	0.12	0.12	0.12
4	Laying of 1.1 KV 4CX25 SQ.MM CABLE	AL, XLPE	0.1042	2.500	0.26	0.26	0.26	0.26	0.26
5	Laying of 1.1 KV 2CX25 SQ.MM CABLE	AL, XLPE	0.1003	0.500	0.05	0.05	0.05	0.05	0.05
6	Laying of 1.1 KV 2CX50 SQ.MM CABLE	AL, XLPE	0.1051	1.000	0.11	0.11	0.11	0.11	0.11
7	Laying of 1.1 KV 3CX95 SQ.MM CABLE	AL, XLPE	0.1195	0.500	0.06	0.06	0.06	0.06	0.06
8	Laying of 1.1 KV 1CX400 SQ.MMCABLE	CU. XLPE	0.2920	9.000	2.63	2.63	2.63	2.63	2.63
	TOTAL OF B			**56.000**	**11.39**	**11.39**	**11.39**	**11.39**	**11.39**
C	**R I Cost (HV+LV)**		0.7708	**24.27**	**18.71**	**18.71**	**18.71**	**18.71**	**18.71**
D	**Auxiliary Distribution Pillars (ADP)**								
1	6 WAY ADP	-	0.0087	95	0.83	0.83	0.83	0.83	0.83
2	10 WAY ADP	-	0.0110	30	0.33	0.33	0.33	0.33	0.33
3	12 WAY ADP	-	0.0125	10	0.12	0.12	0.12	0.12	0.12
	TOTAL OF D			**135**	**1.28**	**1.28**	**1.28**	**1.28**	**1.28**
E	**SERVICE CABLE (QTY IN KM)**								
1	Laying of 1.1 KV 4CX300 SQ.MMCABLE	AL, XLPE	0.2061	26.000	5.36	5.36	5.36	5.36	5.36
2	Laying of 1.1 KV 4CX120 SQ.MMCABLE	AL, XLPE	0.1349	4.000	0.54	0.54	0.54	0.54	0.54
3	Laying of 1.1 KV 4CX70 SQ.MM CABLE	AL, XLPE	0.1232	2.000	0.25	0.25	0.25	0.25	0.25
4	Laying of 1.1 KV 4CX25 SQ.MM CABLE	AL, XLPE	0.1042	2.800	0.29	0.29	0.29	0.29	0.29
5	Laying of 1.1 KV 2CX25 SQ.MM CABLE	AL, XLPE	0.1003	5.200	0.52	0.52	0.52	0.52	0.52
	TOTAL OF E			**40.000**	**6.96**	**6.96**	**6.96**	**6.96**	**6.96**
F	**R I Cost (SERVICE CABLE) (kms)**	**-**	0.7708	**5.830**	**4.49**	**4.49**	**4.49**	**4.49**	**4.49**
	GRAND TOTAL (A+B+C+D+E+F) in Cr	**246.20**			**49.24**	**49.24**	**49.24**	**49.24**	**49.24**

Laying of 11 kV HV cable:-25 km per year

(B) Overlapping if any: - For DSS Schemes, there is no any overlapping of any scheme. It is because for identification purpose, separate Location Code (LC) is allotted for each RDSS.

(C) Reasons for non execution of the same. Is there any duplication? : - It is not true that above approved scheme is note executed.

Details of CAPEX and Capitalization for FY 2020-21, FY 2021-22, FY 2022-23 are given in the following table.

Sr. No.	Particulars	MERC Approved	FY 2020-21	FY 2021-22	FY 2022-23	Total	Balance
1	Capex in Cr	246.20	57.37	44.15	57.01	158.53	**87.67**
2	Capitalization in Cr.	246.20	57.37	44.15	57.01	158.53	**87.67**

The Schemes executed under this DPR and under RDSS DPR are different. Also, there is 'No' any duplication in schemes due allotment of separate Location Code (LC) for RDSS Schemes.

(D) Excel Sheet showing existing length, proposed length, loss reduction, Number of faults and No of joints of 11 kV cable:-
For Excel Sheet showing existing length, proposed length, loss reduction, Number of faults and No of joints of 11 kV cable***, kindly refer Annexure-CF.***

(E) Breakdown Report & O&M Expenditure: -

(1) For break down report of 11kV cables, ***kindly refer Annexure-CG.***

(2) O&M Expenditure for last five years on all equipments is given in the following table:-

Sr. No.	R & M Expenses	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1	Power / Distribution T/F, Cables (33kV/11kV/1.1kV) , Switchgears (33 kV, 11 kV), etc.	21.03	22.01	9.65	17.38	22.32

BEST has not maintained item wise R&M Expenditure. The R&M expenditure made on all electrical equipments are maintained under the head "Lines & Cable Networks" in Books of Accounts. Therefore, separate R&M expenditure on 11 kV cable is not available.

Auxiliary Component Cost for Metering:-

Data Gap No.1: Why FRP Box not considered in the estimate? Only plywood is considered in DPR, Allied accessories are not required such as copper wires, nut bolts.

Reply: **FRP Not Considered in the Estimate**:

1. In the tender, water Tight Aluminum Meter Box with Cover Type along with supply and remaking of the cable gland is considered instead of FRP Box or any other Box.
2. However, vide mail dated 16 August, 2023, M/s. ATL (Arvind Rai) has informed that the RF signal is blocked by Aluminum material. Hence, M/s ATL has requested for alternate box instead of Aluminum Box. ***For details of Mail, Kindly refer Annexure- CH.***
3. In this context, we have discussed the matter with the Meter Board Suppliers viz. M/s ASTS & M/s. Ramelex Pvt. Ltd. for checking alternate options.
4. Subsequently, vide e-mail dated 06.10.2023, Meter Board Suppliers has given confirmation for "Supplying SMC Boxes in place of Aluminum Boxes without any implication in the pricing". ***For e-mail details, kindly refer Annexure-CI.***
5. Further to this, in the DPR estimation allied accessories such as Meter Boards, Cu wire, Clip, MCB (40 A/63 A/100A), Screw, Nail, Earthing wire etc is already considered. ***For the same, kindly refer Annexure-CJ.***

ADMS:-

Data Gap No.1: Why EAPBX is considered for replacement in ADMS Scheme. Difference between existing SCADA and Proposed SCADA.

Reply: The EAPBX inadvertently added in the DPR. However, costing of the same is not considered in the DPR. Hence, same may be considered as deleted from the DPR.

Many technologies that were popular a few years back have started to disappear today. This is only because of the continuous change and innovation in technology.

Difference between existing SCADA and Proposed SCADA:

(A) Existing SCADA system

(i) The SCADA system is having distributed architecture. Numerical relays are installed on individual 33kv, 11 KV switchgears for bay level data acquisition; protection & control. Separate Numerical relays are provided for Transformer primary & secondary switchgears, Bus-coupler and OLTC Tap change control/indication on switchgear itself. All these devices are connected to Remote Terminal Unit (RTU), Gateway in FO network. RTU is mainly used to collect Analog data, Station alarms, Digital Inputs of respective RSS.

(ii) In existing SCADA System, the Gateway communicates with their respective Zonal Control Center & Local HMI using MTNL Leased line connectivity and Local Area Network (LAN). The Communication between RSS SCADA Systems and ZCC SCADA systems is through IEC-104 protocol

(iii) The existing Local SCADA system (HMI PC & Gateway) works on Windows-XP, e-terra Control 3.4 SCADA software. The above SCADA systems communicate on IEC-61850 Edition –I protocol to bay level Numerical Relays.

(iv) At Zonal Control Centres, system consists of SCADA servers, FEP server & WEB cum ICCP server. The servers are redundant and are in hot-standby mode. Apart from these servers, two workstations connected as Human Machine Interface (HMI) operate on dual LAN connectivity.

(v) Existing SCADA System is not cyber security compliant.

(B) ADMS system

(i) Proposed ADMS system consists of SCADA, Distribution Management System (DMS), Outage Management System (OMS), Field Force Automation (FFA), & Communication for ADMS. The proposed ADMS system brings together the Distribution and Outage Management Applications with the SCADA system in a single UI, which is designed to improve the performance of the distribution operators and their managers to manage the network more efficiently.

(ii) The proposed ADMS system is for an open system integrated platform design built upon the latest release of GE's standard, field proven GE Digital Energy suite of products. Being based on a standard product suite, means that future upgrades and enhancements to the system are made significantly easier than would be the case if a custom application were to be developed.

(iii) The Proposed ADMS System will be integrated with other Automation System such as AMI, ERP, GIS, Call Center, etc.

(iv) For proposed ADMS System MPLS communication network main & backup will be installed for RSS, MCC, and BCC. Dual SIM based communication will be installed for all DSS.

(v) The Proposed ADMS System will be integrated with State Load Dispatch Center (SLDC), Kalwa.

(vi) The proposed ADMS System is Cyber security compliant. To ensure Cyber Compliance, Cyber Audit of ADMS will be carried out on half yearly basis from Cyber Security Agency.

ERP System:-

Data Gap No.1: MDM system is not the part of project cost considered by PFC. Justification for including the same in ERP and not in Smart meter.

Reply: (i) We agree, since. The Cost of MDM is not considered by PFC while Approving Loss Reduction DPR.

(ii) BEST management has decided to open separate tender for Smart meter and MDM. Accordingly, Separate tender was invited through open bidding process for each item. Tender details are given in the following table:

Sr. No.	Particulars	Technical Bid date	Price date	No. of time bid date Extended	No. of Bidder	Price Opened	Contractual Value (in Cr)
1.	Smart Meter	**21.07.2022**	**06.09.2022**	5	6	3	1303.16
2.	MDM	**06.02.2023**	**14.02.2023**	1	4	4	20.91

(iii) Tender for Smart meters was already opened, hence by considering the quoted rates, DPR for Smart Meter was prepared and submitted to MERC on 25.10.2022 for the Hon'ble Commissions in-principle approval. After submission of DPR, PFC has approved Loss Reduction DPR on 21.11.2022. Therefore, by considering Grant Approved by PFC, revised DPR is submitted on 31.01.2023. While Approving Loss Reduction DPR, the cost of MDM was not considered, Also, Rates for MDM were not available; hence, MDM was not included in the Smart Meter DPR.

(iv) While Preparing the DPR for ERP, Billing Software & IT/OT enablement work, the quoted rates of MDM was available. Further to this, MDM and Billing Software are the part of Smart Metering and hence, MDM is included in the ERP.

(v) Now, MDM is removed from this DPR and for the same separate DPR will be submitted in due course.

Appendix-B

Reply to the Data Gaps raised by Hon'ble Commission on "RDSS DPR of Rs. 1578.39 Cr submitted to MERC on 05.10.2023".

Data Gap: In continuation to the mail dated 09.10.2023, you are requested to submit the basis of the cost estimate. Separate excel sheet of the cost proposed and combined excel sheet of the total scheme.

You are requested to give the reference in the excel sheet from which the per unit cost is considered. You are also requested to attach the reference P.Os.

For RI charges, you are requested to attach the recent circular of BMC and details about RI charges computation in excel sheet.

Reply: **A) Basis of the cost estimate of the RDSS DPR and reference POs**: - The estimated cost considered in the DPR is based on the recent placed Letter of Award (LoA) on the respective firms which are given below.

- For RSS items LoA is placed on **"The Tata Power Co. Ltd."** (Total contractual value Rs. 344.64 Cr.). ***For Copy of LOA, kindly refer Annexure-CV, Pg. No. 4 to17.***
- For DSS items LoA is placed on "**Rahul Cables Pvt. Ltd**." (Total contractual value Rs. 420.65 Cr.). ***For Copy of LOA, kindly refer Annexure -CW, Pg. No.4 to11.***
- For Auxiliary Component LoA is placed on **"RAMELEX Pvt. Ltd. (Rs. 32.82 Cr.) and ASTS Smart Infrastructure Pvt. Ltd. (Rs. 49.23 Cr.)** (Total contractual value Rs. 82.05 Cr.). ***For Copy of LOA, kindly refer Annexure-CX, 9 to14.***
- For ADMS LoA is placed on **"Larsen & Toubro Ltd."** (Total contractual value Rs. 182.15 Cr.). ***For Copy of LOA, kindly refer Annexure-CY.***
- For ERP, Billing Software and IT/OT Enablement Work LoA is placed on **"Infinite Computer Solution India Ltd."** (Total contractual value Rs. 235.93 Cr.). ***For Copy of LOA, kindly refer Annexre-CZ,4 to17 and***
- For PMA LoA is placed on **"**REC Power Development and Consultancy Ltd.**"** (Total contractual value Rs. 15.24 Cr.). ***For Copy of LOA, kindly refer Annexure-CR.***

  B) **Excel sheet from which the per unit cost is considered with Reference:**
  - For RSS costing, kindly refer Annexure -DA.
  - For DSS costing, kindly refer Annexure -DB.
  - For Auxiliary Component Costing, kindly refer Annexure -DC.
  - For ADMS Costing, kindly refer Annexure -DD and
  - For ERP, Billing Software and IT/OT Enablement works costing, kindly refer Annexure -DE.
  - For combined costing of all items to be proposed under RDSS (Loss Reduction) costing, kindly refer Annexure -DF.
  - For PMA Charges, kindly refer Annexure -CR.

C) **For RI charges, the recent circular of BMC and details about RI charges computation in excel sheet**: -

For recent Circular of BMC for RI charges, kindly refer, Annexure-CC.

For detail calculation of RI Charges (Excel Sheet), kindly refer Annexure-DG.

Appendix-C

Reply to the Data Gaps raised by Hon'ble Commission on "RDSS DPR of Rs. 1749.27 Cr submitted to MERC on 05.10.2023".

Data Gap 1: In addition to above you are requested to clarify why the tender amount is not restricted to the amount approved by PFC?

Response: The proposed projects are approved under RDSS with GOI Support. Further for the additional expenditure excluding RI, BEST has approached PFC for the loan amount of Rs 1140.45 Cr vide letter dated 19.05.2023. A copy of Ref Letter for the same is attached herewith ***as Exhibit-4***. BEST will approach separately to PFC for RI charges. Please note that 33 kV cable work is already started.

Data Gap 2: In past BEST is not in a position to complete the projects due to constraints in the fund. Now in this case when the budgetary cost proposed is higher than the approved cost, considering past experience, justify how the projects under the proposed DPR will be completed in time.

Response: Earlier, IPDS Turnkey contract was allotted to L&T Pvt. Ltd. for execution of the project costing Rs.104.62 Cr. In similar line, GoI has approved Rs.972.88 Cr for execution of Infrastructure works related to Distribution System projects under RDSS with GBS/Grant Rs.583.73 Cr. To complete the RDSS project in time, BEST has applied PFC for Long Term Loan of Rs.1140.45 Cr. However, PFC has approved total Rs.778.30 Cr (vide letter dated 09.08.2023 against Loan No. 2198501 and Loan No. 2198502 each Rs. 389.15 Cr) ***(refer Exihibit-1 & Exihibit-2.)***.

Data Gap 3: In addition kindly submit the reason for increase in meter boxes in the tender as compared to the approved by PFC.

Response: Initially BEST was submitted the proposal for replacement of Meter Boards for single phase (15 Nos. per Board), Three Phase (4 Nos. per Board), Single Phase for Hutment area (10 Nos. per Board) and water tight Aluminum Meter Boxes along with Board wiring and MCBs accommodating 8,01,374 Nos. of meters. Subsequently, PFC has approved meter Boars of various sizes for accommodating 5,23,357 Nos. of meters. However, to accommodate the same nos. of meters BEST was invited tender. All the tenderer were quoted for 74,666 Nos. of meter boxes/boards of various sizes which can accommodate total 4,50,090 Nos. meters. Therefore, BEST has decided to replace 74,666 Nos. of meter boxes/boards of various sizes to accommodate 445090 No. of meters.

ERP System:-

Data Gap 4: Reason for not considering item wise cost as per IPDS proposal while submitting the proposal to Govt. of India and why it is considered while submitting capex for approval of the Commission. Explanation given for cost increase due to rates used in IPDS schemes is not in line with the Ministry approval.

Reply: (i) It is true that item wise cost was not submitted while submitting the proposal to GoI. BEST is implementing ERP project first time and had no any field experience about this project. Therefore, for implementation of project detail study such as background of existing system, present scenario and what to do, how to implement the project in BEST was carried out by outside party. Accordingly, the proposal was submitted to PFC. For successful implementation of this project in BEST and to avoid any ambiguity, item wise details were considered in the RFP and accordingly tender was invited. Subsequently, vendors have also quoted in the tender.

(ii) For finalizing Rates of ERP, Billing Software and IT/OT enablement works PFC has used various criteria. For "Network connectivity across all sites, head office and central cloud infrastructure" PFC has simply considered the rates approved for MSEDCL. It is appropriate to consider the cost item for BEST as the working conditions of two companies are different. Infrastructure Hardware cost is also restricted to 20% of the proposal cost for the infra required for ERP deployment. BEST and MSEDCL are two different utilities.

Data Gap 5: Further reason for not submitting the proposal to the ministry with latest Technology and considering the same at the time of capex.

Reply: 1. BEST had no any field experience about this project. Therefore, for implementation of project detail study such as background of existing system, present scenario and what to do, how to implement the project in BEST was carried out by outside party. Accordingly, proposal was submitted to the ministry. However, in the RFP latest technology is considered and accordingly tender was invited for "Implementation of ERP, Billing Software and IT/OT enablement works".

2. As per Capex Regulation, 2022 Clause, 3.9

(e) Capital Nature funded schemes partially by Central Government of India.
(o) Improvement in consumer services.

The proposal is submitted under Capex.

Data Gap 6: Reason for including maintenance charges in the proposal of ERP. Justify the same with respect to NAV instead of considering it under O&M.

Response: Considering AMC cost (FMS Charges & O&M Cost) as capex in Option 1 and annual AMC cost (FMS Charges & O&M Cost) considered under Opex in Option 2.

Options	Scheme cost (Rs. Cr.)
Option I: AMC cost considered as part of capex cost	235.93
Option II: AMC cost considered as Opex	196.65

If the scheme is executed under Opex, all the cost except for AMC will be incurred in year 1 itself and only AMC cost will be annual, whereas if it is incurred under Capex, the whole investment will be incurred in year 1, which will include lumpsum advance payment of AMC, which will also be capitalised. In capex model, the sum total of depreciation, interest and return will be the annual impact on ARR corresponding to the total capitalised cost of Rs. 235.93 Cr.

The time period for PV is considered as 7 years as per the depreciable useful life as provided in the Tariff Regulations (15% depreciation rate). As shown above, the Present Value of tariff impact of capex execution phased over the period of the asset is better compared to, if the scheme is executed as Opex. Thus, there is no disadvantage to consumers, if the scheme is carried out under Capex.

Further, the impact per unit of sales & the present value of the same under the following four scenarios is provided below. The working is attached as Exhibit- 3.

Scenario I: Capex cost of Rs. 196.65 Cr with AMC cost being considered as Opex in the respective years.

▪ Scenario II: Rs. 196.65 Cr being considered as Opex in the first year of incurrence in addition to AMC cost being considered as Opex in the respective years.

▪ Scenario III: Capex cost of Rs. 235.93 Cr inclusive of AMC cost being part of Capex.

▪ Scenario IV: Rs. 235.93 Cr being considered as Opex in the first year of incurrence.

Scenarios/ Rs/U	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	PV
I	0.047	0.099	0.089	0.084	0.070	0.066	0.065	0.018	0.39
II	0.424	(0.003)	(0.002)	(0.000)	(0.008)	(0.008)	(0.008)	(0.008)	0.40
III	0.058	0.115	0.102	0.093	0.086	0.081	0.080	0.023	0.46
IV	0.510	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	0.47

The present value (PV) over the life of the asset in above four scenarios is similar. In fact, executing the project under Opex will have huge impact on tariff in the first year. In order to avoid such huge impact on tariff, smoothening of the impact is a preferable option, which can be achieved by executing the project under Capex. ***Kindly refer Exihit-3.***

Further, the scheme involves procurement of access control system, server, and setting up of control room, etc., which are of nature of capex. The licensee fee kind of recurring expense forms very small portion of entire Capex. On the scheme being executed under Opex, there will be an immediate tariff impact as demonstrated above.

The Hon'ble Commission has also adopted the philosophy of smoothening of tariff and not burdening the consumer at a single instance. For this, BEST would like to extract the philosophy from the certain Orders of the Hon'ble Commission.

Order of the Hon'ble Commission dated 22-08-2013 in Case No. 9 of 2013:

"Further, under a MYT regime, it would be better to have a smooth tariff trajectory. Hence, the Commission has adjusted the revenue requirement of each year, by deferring adjustment of surpluses in future periods, in such a manner that the average tariff increase for all three years is similar."

Order of the Hon'ble Commission dated 21-10-2016 in Case No. 34 of 2016:

"

This cumulative Revenue Gap should be recovered in the minimum number of years required to minimise the burden of carrying cost while at the same time ensuring that there is no tariff shock to consumers and that the tariff trajectory is smooth."

Thus, there is no disadvantage to consumers, if the scheme is carried out under Capex.

- **SCADA:-**

Data Gap 7: Justification for considering 5 years FMS charges in terms of NAV instead of considering it under O&M.

Response: As per MERC Regulation 2019, Annexure-I, Depreciation Rate (Straight Line Method) for IT equipments is 15% and Depreciation Rate for Software is 30%. Accordingly, life of IT equipment and current installed software shall be 6 years and 3 years respectively.

ADMS is a state of art system and requires skilled manpower in Electronic, Telecommunication, IT and Cyber security, however BEST don't having experts in these fields. Further to this, ADMS project includes 77 Nos. of RSS, 870 Strategic Located DSS and 1900 eFPI DSS. BEST doesn't have manpower for maintaining these many sites on our own. By considering above facts, BEST proposed FMS charges in the proposal as against O&M.

- **33 kV Switchgears and 11 KV Switchgears:-**

Data Gap 8: Justification for increase in cost from the tendered value is not clear. If higher rate (Latest PO and IPDS) is considered for tendering, reason for increase in cost when the latest P.O. of BEST has lower value.

Response: 1. **33 kV switchgears (Qty- 19 Nos.)**: (i) BEST cost estimation was based on the IPDS P.O. (M/s. L&T Ltd. in 2018) with unit Cost of Rs. 0.1499 Cr with escalation the cost is Rs.0.1979 Cr (Rs.0.1499*120% Cr = Rs.0.1799 Cr, Rs.0.1799 * 110% = Rs.0.1979 Cr). However, PFC material cost estimation was based on latest P.O. (issued in Feb.-22, M/s. Stelmec Ltd.) with unit cost of Rs 0.1478 Cr. Cost committee compared the rates of latest P.O (Rs. 0.1478 Cr/unit) with IPDS LOA (Rs. 0.1979 Cr/Unit). Cost Committee considered BEST SOR for Erection & Transportation cost. Thus, Total cost considered for replacement by PFC is Rs. 0.1732 Cr/unit including Erection & Transportation cost.

(ii) Please note that the Per unit cost derived in the tender in year 2022 for material supply, Installation and commissioning of 1500 MVA, 33 kV Switchgears is Rs. 0.2581 Cr.

(iii) The main difference between Latest P.O and IPDS LoA is that from latest P.O BEST is purchasing switchgears directly from the firm whereas in IPDS LoA, PIA is purchasing switchgears for BEST. Obviously, the cost of switchgears purchased by PIA is on higher sided as compared to BEST purchasing switchgears directly from the firm, Stelmec Ltd.

(iv) For Erection & Transportation, the cost of BEST SOR is at lower side as compared to PIA (IPDS) cost.

2. 11kV, 350 MVA old Switchgears (Qty- 32 Nos.): (i) BEST estimation was based on the IPDS P.O. (M/s. L&T Ltd. in 2018), Rs.0.8148 Cr/unit. However, PFC has considered the latest P.O. of BEST with cost Rs.0.4330 Cr/unit without taxes (Megawin Switchgear Pvt. Ltd.). The Committee recommended final unit cost of Rs. 0.6309 Cr/unit considering escalation factor of 15% and transportation, Dismantling & installation cost as per BEST SOR

(ii) The main difference between Latest P.O and IPDS LoA is that from latest P.O BEST is purchasing switchgears directly from the firm (Megawin Switchgear Ltd.) whereas in IPDS LoA, PIA (M/s. L & T Ltd) is purchasing switchgears for BEST. P.O. Obviously, the cost of switchgears purchased by PIA is on higher sided as compared to BEST purchasing switchgears directly from the firm,

(iii) It is to be mentioned that the Erection & Transportation cost of BEST SoR is much lower side as compared with PIA cost (IPDS) due to wage difference.

- **RSS**:-

Data Gap 9: Reason for estimating on IPDS rates when latest P.O. rates are available while doing tender process and deviate from the proposal submitted to Central Govt.

Response: The RDSS project is to be executed on Turnkey contract basis, therefore estimation of the project shall be based on earlier executed turnkey project and not on current P.O. rates. The main difference between IPDS P.O and latest P.O. is that "from latest it clears that BEST purchasing material directly from the manufacturers whereas in IPDS P.O. Turnkey contractor is purchasing material from manufacturers for BEST. Obviously, the cost of material purchased under IPDS will be on higher side as compared to Latest P.O. Therefore, for getting proper realistic estimation, IPDS Rates were considered.

In view of this, tender cost is on higher side as compared to PFC considered cost.

Data Gap 10: DTs and SF6 RMU replacement reason for cost increase is not clear.

Response: 1. **DT Replacement**: (i) For replacement of DTs, BEST's material cost estimation was based on BEST Schedule of Rates (SOR) of FY2021-22. Wherein 995 kVA DT cost is considered as Rs 14.17 Cr and total estimation was Rs. 0.31 Cr. However, Committee reviewed the rate analysis submitted by BEST and finally Cost Committee adopted final unit cost of Rs. 28.95 Lakh/unit (inclusive of ADP & LV pillars).
(ii) For Erection & Transportation cost of DT, Cost committee considered BEST SOR (FY2021-22). The cost for FY2022-23 is worked out by considering 5% inflation where as actual inflation as per WPI and CPI is more. It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with IPDS project (PIA) cost due to wage difference.

2. SF6 RMU replacement: (i) For SF6 RMU replacement, BEST's material cost estimation was was based on BEST SOR (in FY2021-22). However, Committee reviewed the rate analysis submitted by BEST and Cost Committee derived the unit cost of 3 Way and 4 Way RMU from P.O. Oct 21 considering 5% escalation on cost. Accordingly, cost committee adopted final unit cost of Rs. 8.24 Lakh/unit considering average cost of 3 Way and 4 Way Type SF6 RMU's.

(ii) For Erection & Transportation cost of RMU, Cost committee considered the cost as per BEST SOR (FY2021-22). It is to be mentioned that the Erection & Transportation cost of BEST SOR is much lower side as compared with PIA cost due to wage difference.

In view of this, tender cost is on higher side as compared to PFC considered cost.

- **33 KV and 11 KV cables and LV cables:-**

Data Gap 11: Justification for not submitting the proposal for approval inclusive of RI charges to Central Govt. when it is known fact that RI charges constitute major part of the cabling work?

Response: As per Guidelines issued by MoP, Chaper-4, Para 4.1, it is specified that project cost shall not include road cutting Charges and because of which same cost is not included in the PFC DPR.

Data Gap 12: BEST has not justified the escalation in terms of WPI and CPI for each scheme for year FY 2022-23 in comparison with FY 2021-22**.**

Response: The retail inflation, as measured by Consumer Price Index (CPI) moderates to 5.2% in 2021-22 (April-December) from 6.6% in the corresponding period of 2020-21. Wholesale Price Index (WPI) inflation has shown an increasing trend and has remained high touching 12.5% during 2021-22. However BEST has not considered the CPI and WPI for estimation purpose in FY2021-22 and FY2022-23. While submitting the proposal to PFC, for cost estimation purpose BEST was considered the material rates as per IPDS and Latest P.Os and Erection and Transportation costing as per BEST SOR. PFC has considered the average rate in terms of latest PO of BEST and the PO executed under IPDS Scheme. Also, in some cases PFC has considered its benchmark cost for the approval.

Data Gap 13: How much loss reduction BEST is expecting after execution of the proposals under RDSS.

Response: After execution of the proposal under RDSS, as per CBA report submitted by BEST, it is expected to save about Rs. 125.28 Cr (Rs. 38.16 Cr in FY 2023-24, Rs.42.03 Cr in FY2024-25 and Rs. 45.09 Cr in FY2025-26).

Annexure 24

"सुधारित वितरण क्षेत्र योजना-सुधारणा-अधिष्ठित आणि निष्पत्ती- आधारित योजना (Revamped Distribution Sector Scheme Reforms-Based and Results-Linked)" (RDSS) राज्यात महावितरण व बेस्ट उपक्रमामार्फत राबविण्यास मान्यता देणेबाबत.

महाराष्ट्र शासन

उद्योग, ऊर्जा व कामगार विभाग

शासन निर्णय क्रमांक : संकिर्ण-२०२१/प्र.क्र.२१५/ऊर्जा-५

मादाम कामा रोड, हुतात्मा राजगुरु चौक, मंत्रालय, मुंबई- ४०० ०३२.

दिनांक : २५ ऑगस्ट, २०२२.

संदर्भ :- १. ग्रामीण विद्युतीकरण महामंडळ मर्या यांचे पत्र क्र.REC/RDSS/21-22/81, दि.१८.११.२०२१

२. बेस्ट उपक्रमाचे पत्र क्र. DO/GM/CEM/३४५००/२०२०-२१, दि.१४.१२.२०२१

३. ग्रामीण विद्युतीकरण महामंडळ मर्या यांचे पत्र क्र.REC/RDSS/21-22/निरंक, दि.०३.०१.२०२२

४. महावितरण कंपनीचे पत्र क्र. संचालक (वित्त)/मराविविकं मर्या./२०२२-२३/२१८, दि.१९.०५.२०२२

५. महावितरण कंपनीचे पत्र क्र.महावितरण/ RDSS/१५७०७, दि.१३.०६.२०२२

प्रस्तावना:-

विद्युत वितरण क्षेत्राला अधिक सक्षम करण्याकरीता केंद्र शासनाने सन २०१४ मध्ये राज्यातील ग्रामीण भागातील विद्युत पायाभूत सुविधांचे सक्षमीकरण करण्याकरीता दिनदयाळ उपाध्याय ग्राम ज्योती योजना (DDUGJY) तसेच शहरी भागातील विद्युत पायाभूत सुविधांचे सक्षमीकरण करण्याकरीता एकात्मिक ऊर्जा विकास योजना (IPDS) राबविण्यात आल्या. या दोन्ही योजनांद्वारे महावितरण कंपनीचे राज्यातील वितरण प्रणालीचे बळकटीकरण करण्यात आले. सद्यस्थितीत या दोन्ही योजना पूर्णत्वास आल्या आहेत. या शिवाय केंद्र पुरस्कृत सौभाग्य (प्रधानमंत्री सहज बिजली हर घर योजना) योजनेद्वारे विद्युतीकरण न झालेल्या घरकुलांचे विद्युतीकरण करण्यात आले आहे. ज्या अंतर्गत ऑक्टोबर २०१७ ते दि.३१.०३.२०१९ या योजना कालावधी मध्ये राज्यातील १५,१७,९२२ घरकुलांना ग्रीड कनेक्टिव्हिटीद्वारे व ३०,५३८ घरकुलांना सौर ऊर्जेद्वारे वीज जोडण्या देण्यात आल्या आहेत.

उपरोक्त केंद्र पुरस्कृत विद्युत पायाभूत सुविधा योजना राबविल्यानंतरही एकूण तांत्रिक व वाणिज्यिक हानी (Aggregate Technical & Commercial (AT & C) Loss) तसेच सरासरी वीजपुरवठा खर्च व सरासरी प्राप्त महसूल (Average Cost of Supply वजा Average Revenue Realized (ACS वजा ARR)) या मधील अंतर (gap) जास्त असल्याचे केंद्रशासनाच्या निदर्शनास आले आहे. याकरिता वितरण कंपन्यांनी त्यांची कार्यरत कार्यक्षमता (Operational Efficiency) व आर्थिक स्थिरता (Financial Sustainability) यामध्ये सुधारणा करण्याकडे लक्ष केंद्रीत करण्याची गरज आहे असे निदर्शनास आले आहे. जेणेकरुन ग्राहकसेवा मानकांप्रमाणे ग्राहकांना सेवा मिळेल. हे साध्य करण्याकरिता सध्याच्या वितरण प्रणालीमध्ये मोठया प्रमाणावर सुधारणा करणे व अशा योजना राबविणे ज्यामध्ये वितरण हानी कमी होण्याबरोबरच वितरण कंपन्या आर्थिकदृष्टया सक्षम होतील व Operational कार्यक्षमता सुधारेल हे लक्ष्य समोर ठेवून ग्राहकांना अखंडीत, दर्जेदार, विश्वसनीय व परवडणारा वीज पुरवठा देण्याची कटीबध्दता याचे भान ठेवून केंद्र शासनाने "सुधारित वितरण क्षेत्र योजना-सुधारणा-अधिष्ठित आणि निष्पत्ती- आधारित योजना (Revamped Distribution Sector Scheme Reforms-Based and Results-Linked)" (RDSS) हा कालबध्द कार्यक्रम राबविण्याचे जाहीर केले आहे.

महाराष्ट्र राज्याकरिता पॉवर फायनान्स कॉपोरेशन (PFC) या संस्थेस सुकाणू अभिकरण (Nodal Agency) म्हणून केंद्रशासनाद्वारे नेमण्यात आले आहे.

२. "सुधारित वितरण क्षेत्र योजना-सुधारणा-अधिष्ठित आणि निष्पत्ती-आधारित योजना (Revamped Distribution Sector Scheme Reforms-Based and Results-Linked)" (RDSS) योजनेची ठळक वैशिष्ट्ये खालीलप्रमाणे आहेत:-

(१) योजनेची उद्दिष्टे:-

(२) योजनेचे घटक : -

भाग (अ) :-

घटक (१) :- मिटरींग :-

घटक (२) वितरण पायाभुत सुविधा विषयक कामे :-

१) वितरण हानी कमी करण्याअंतर्गत कामे :-

२) वितरण प्रणाली बळकटीकरण करण्याअंतर्गत कामे:-

घटक (३) :- प्रकल्प व्यवस्थापन (Project Management) :-

भाग (ब) :-

(३) RDSS योजनेअंतर्गत निधी व्यवस्थापन:-

(४) योजना समाप्ती दिनांक (Sunset Date):-

३. महावितरण कंपनीद्वारे सादर करण्यात आलेल्या DPR मधील राज्यशासनाने केंद्रशासनास शिफारस केलेली कामे:-

(अ) मिटरींग कार्यक्रम (Totex Modeद्वारे)

१) RDSS योजने अंतर्गत ग्राहकांना प्रिपेड/स्मार्ट मीटर:-

.क्र.	पशील	ंख्या
१	एकूण ग्राहक संख्या (वितरण फ्रॅन्चायजी ग्राहक वगळून)	२,८१,३४,८७६
२	प्रस्तावित प्रिपेड मीटर्स (कृषीपंप ग्राहक व ग्रामीण भागातील विखुरलेले ग्राहक वगळून)	१,६६,१८,८३३
	या घटकांतर्गत खर्च-	**रु.१०,०५१ कोटी**

२) प्रिपेड मीटर्स बसविण्याचा कार्यक्रम:-

अ.क्र.	तपशील	कालमर्यादा	संख्या
१	टप्पा-१	डिसेंबर २०२३	९४,१९,३०२
२	टप्पा-२	मार्च २०२५	७१,९९,५३१

३) वितरण रोहित्र व फिडर स्मार्ट मिटरिंग कार्यक्रम:-

अ.क्र.	**वितरण रोहित्र स्मार्ट मिटरिंग कार्यक्रम**	**संख्या**
१	एकूण वितरण रोहित्र	७,७९,९५७
२	रोहित्र स्मार्ट मिटरिंग	४,०७,५०७ *
३	वितरण वाहिनी स्मार्ट मिटरींग	२७,८२६
	या घटकांतर्गत खर्च	**रु.१०५४ कोटी**

*(कृषीपंप रोहित्र, HVDS व २५ KVA पर्यंतच्या क्षमतेचे रोहित्र यांना स्मार्ट मिटर्स बसविण्यात येणार नाही.)

४) वितरण रोहित्र व फिडर यांना स्मार्ट मीटर बसविण्याचा कार्यक्रम:-

अ.क्र.	**तपशील**	**कालमर्यादा**	**संख्या**
१	टप्पा-१	डिसेंबर २०२३	२,५८,०१५ *
२	टप्पा-२	मार्च २०२५	१,७७,३१८

* यामध्ये २७,८२६ फिडर मिटर्स अंर्तभूत आहेत

(ब) वितरण पायाभूत सुविधा विषयक कामे :-

(१) वितरण हानी कमी करण्या अंतर्गत कामे:-

अ.क्र.	**कामाचा तपशील**	**प्रमाण**	**परिमाण**	**खर्च (रु. कोटी)**
१	वाहिनी विलगीकरण	४७१२	संख्या	७११३.९१
२	एरियल बंच केबल	३०,३३२	किमी	१८२०.१५
३	उच्चदाब / लघुदाब वाहिनी अपग्रेडेशन	१९,८८४	किमी	१२९६.७०
४	मल्टी मिटर सर्विस बॉक्स	३,९८,०८०	संख्या	६३८
५	उच्च दाब वाहिनी विभाजन	९,९९७	किमी	११८०.११
६	HVDS रोहित्र	५,१७०	संख्या	३१३.७१
७	कॅपॅसीटर बॉक्स	२,०५१	संख्या	१८८.७०
८	IT/OT	-	-	८४९
९	इलेक्ट्रीक व्हेईकल चार्जिंग	२५०	संख्या	१७४
१०	कव्हर्ड कंडक्टर	३३३	स.किमी	६१.२०
११	लघुदाब उपरी तारमार्ग रुपांतरण व उच्चदाब भूमिगत वाहिनी रुपांतरण	-	किमी	३००.९०
१२	इतर कामे	-	-	२९५
			या घटकांतर्गत खर्च	**१४,२३१**

(२) वितरण प्रणाली बळकटीकरण अंतर्गत कामे:-

.क्र.	ामाचा तपशील	माण	रिमाण	र्च रु. ोटी)
१	नवीन उपकेंद्र	३७७	संख्या	९९८
२	अतिरिक्त उपकेंद्र रोहित्र	२९९	संख्या	३४१
३	उपकेंद्र रोहित्र क्षमतावाढ	२९२	संख्या	२९८
४	उच्चदाब वाहिनी	२१,६९१	किमी	२२०४
५	उच्चदाब भूमिगत वाहिनी	४,१७१	किमी	१३७७
६	नवीन लघुदाब वाहिनी	१४,४८०	संख्या	८८३
७	नवीन वितरण रोहित्र	२९,८९३	संख्या	१२६४
८	वितरण रोहित्र क्षमतावाढ	१६,३५१	संख्या	८४३
९	SCADA/DMS	२१	संख्या	१३०२
१०	फॉल्ट पॅसेज इंडिकेटर्स	५१,१२८	संख्या	२२२.४
११	आपत्ती संवेदनक्षम क्षेत्रातील पायाभूत सुविधा	--	--	२१०३
१२	औद्योगिक क्षेत्रातील पायाभूत सुविधा	--	--	६५०
१३	संवेदनशील भागातील कामे	--	--	५४८
१४	फिडर बे	१२०४	संख्या	१७८
१५	स्विचिंग केंद्र	२२	संख्या	५७.१
१६	इतर कामे	--	--	९९६
		या घटकांतर्गत खर्च		**१४,२६६**

(क) योजनेअंतर्गत प्रकल्प खर्च (DPR) :-

(रु.कोटी)

अ.क्र.	कामे	खर्च
१	स्मार्ट मिटरिंग	११,१०५
२	वितरण हानी कमी करणे	१४,२३१
३	प्रणाली बळकटीकरण	१४,२६६
	एकूण	**३९,६०२**

(ड) महावितरणद्वारे निश्चित केलेला व राज्यशासनाने मान्य केलेला कृती आराखडा:- AT & C Loss Reduction & ACS- ARR Gap Reduction:-

	Base Year FY २०-२१	उद्दिष्टे			
		FY २१-२२	FY २२-२३	FY २३-२४	FY २४-२५
AT& C Loss %	२०.७३	१९.१६	१८.१६	१६.०९	१४.१
ACS- ARR Gap (Rs./per KWH)	१.३	०.६२	०.३५	०.२०	०.००

(इ) कृती आराखड्याअंतर्गत भौतिक उद्दिष्टे :-

१.वितरण हानी कमी करणे:-

.क्र.	ामाचा तपशील	माण	रिमाण	ौतिक उद्दिष्टे		
				सन २२-२३	सन २३-२४	सन २४-२५
१	वाहिनी विलगीकरण	४,७१२	संख्या	४७१	२,३५६	१,८८५
२	एरियल बंच केबल	३०,३३२	किमी	३,०३३	१५,१६६	१२,१३३
३	उच्चदाब / लघुदाब वाहिनी अपग्रेडेशन	१९,८८४	किमी	१,९८८	९,९४२	७,९५४
४	मल्टी मिटर सर्विस बॉक्स	३,९८,०८०	संख्या	३९,८०८	१,९९,०४०	१,५९,२३२
५	उच्च दाब वाहिनी विभागणी	९,९९७	किमी	१,०००	४,९९९	३,९९८
६	HVDS रोहित्र	५,१७०	संख्या	५१७	२,५८५	२,०६८
७	कॅपसीटर बॉक्स	२,०५१	संख्या	२०५	१,०२६	८२०
८	इलेक्ट्रीक व्हेईकल चार्जिंग	२५०	संख्या	२५	१२५	१००
९	आवरीत तारमार्ग (Covered Conductor)	३३३	स.किमी	३३	१६७	१३३

२.वितरण प्रणाली बळकटीकरण:-

अ.क्र.	कामाचा तपशील	प्रमाण	परिमाण	भौतिक उद्दिष्टे			
				सन २०२२-२३	सन २०२३-२४	सन २०२४-२५	सन २०२५-२६
१	नवीन उपकेंद्र	३७७	संख्या	०	३८	१८९	१५१
२	अतिरिक्त उपकेंद्र रोहित्र	२९९	संख्या	०	३०	१५०	११९
३	उपकेंद्र रोहित्र क्षमतावाढ	२९२	संख्या	०	२९	१४६	११७
४	उच्चदाब वाहिनी	२१,६९१	स.किमी	०	२१६९	१०८४६	८६७६
५	उच्चदाब केबल	४,१७१	स.किमी	०	४१७	२०८५	१६६८
६	लघुदाब वाहिनी बदलणे	१४,४८०	संख्या	०	१४४८	७२४०	५७९२
७	नवीन वितरण रोहित्र	२९,८९३	संख्या	०	२९८९	१४९४७	११९५७
८	वितरण रोहित्र क्षमतावाढ	१६,३५१	संख्या	०	१६३५	८१७६	६५४०
९	SCADA/DMS	२१	संख्या	०	१	११	९
१०	फॉल्ट पॅसेज इंडिकेटर्स	५१,१२८	संख्या	०	५११३	२५५६४	२०४५१
११	फिडर बे	१२०४	संख्या	०	१२०	६०२	४८२
१२	स्विचिंग केंद्र	२२	संख्या	०	२	११	९

४. **बेस्ट उपक्रमाद्वारे सादर करण्यात आलेल्या DPR मधील राज्यशासनाने केंद्रशासनास शिफारस केलेली कामे:-**

(अ) मिटरींग कार्यक्रम (Totex Modeद्वारे)

१) RDSS योजने अंतर्गत ग्राहकांना प्रिपेड/स्मार्ट मीटर:-

अ.क्र.	तपशील	कालमर्यादा	संख्या
१	टप्पा-१	डिसेंबर २०२३	१०,६२,५९२
२	टप्पा-२	मार्च २०२५	१३,२८९
		या घटकांतर्गत खर्च	रु.६९४.६९ कोटी

२) वितरण रोहित्र व फिडर स्मार्ट मिटरिंग कार्यक्रमः-

.क्र.	पशील	ालमर्यादा	ंख्या
१	टप्पा-१	डिसेंबर २०२३	४७२६*
२	टप्पा-२	मार्च २०२५	६०*
		या घटकांतर्गत खर्च	**रु.१३.८५ कोटी**

*** यामध्ये १३८८ फिडर मिटर्स अंतर्भूत आहेत.**

(ब) वितरण पायाभूत सुविधाविषयक कामे:-

(१) वितरण हानी कमी करण्याअंतर्गत कामे:-

(रु.कोटी)

अ.क्र.	कामाचा तपशील	प्रमाण	परिमाण	खर्च
१	संग्राही उपकेंद्रामध्ये रिलेसह ११ केव्ही स्विचगिअर्स बदलणे. (RSS)	३२	संख्या	२७.३०
२	वितरण उपकेंद्रामध्ये ११ केव्ही ओसीबी स्विचगिअर्स बदलणे. (DSS)	५६४	संख्या	११०.८३
३	संग्राही उपकेंद्रामध्ये रिलेसह ३३ केव्ही स्विचगिअर्स बदलणे.	१९	संख्या	४.०१
४	वितरण उपकेंद्रामध्ये जुने RMU बदलणे.	११८	संख्या	९.६९
५	इतर (रिले, नियंत्रण पॅनेल, पॉवर पॅक, सुटे भाग इत्यादी)	-	-	५५.७६
	या घटकांतर्गत खर्च		**"अ"**	**रु.२०७.५९ कोटी**

(२) वितरण प्रणाली बळकटीकरण अंतर्गत कामे:-

(रु.कोटी)

अ.क्र.	कामाचा तपशील	प्रमाण	परिमाण	खर्च
१	उपकेंद्राचे नुतनीकरण (अतिरिक्त रोहित्र किंवा बदलणे)	१०२१	संख्या	२८०.४७
२	नवीन उपकेंद्र स्थापित करणे	१००	संख्या	१३४.९०
३	३३ केव्ही केबल बदलणे	१२०	किमी	१९२.००
४	उच्चदाब, कमकुमवत किंवा जुनी केबल बदलणे	४१३	किमी	२०६.५०
५	लघुदाब, कमकुमवत किंवा जुनी केबल बदलणे	४००	किमी	१६०.००
६	संग्राही उपकेंद्र प्रगत करणे (SCADA & DMS)	७७	संख्या	
७	वितरण उपकेंद्र प्रगत करणे (SCADA & DMS)	१०७०	संख्या	२२३.२०
८	इंटरप्राईझ संसाधन नियोजन (ERP), एकसंधता (युनिफाइड) विद्युत प्रणाली आणि माहिती तंत्रज्ञान (IT/OT) सक्षमीकरण करणे	-	-	७१४.२६
९	इतर (नवीन संग्राही केंद्रे, अर्थिंग, बॅटरी चार्जिंग, नवीन आर.एम.यू. इत्यादी)	-	-	२०२.०८
	या घटकांतर्गत खर्च :- "ब"			**२११३.४१**
	एकूण खर्च (अ+ब)- रु. २३२१.०० कोटी			

(३) प्रणाली आधुनिकीकरण :-

(रु.कोटी)

.क्र.	ामाचा तपशील	माण	रिमाण	र्च
१	वितरण केंद्राचे रिमॉडेलिंग	१५०	संख्या	१२२.२२
२	वितरण उपकेंद्र स्थापन करणे	१००	संख्या	१२७.७२
३	संग्राही केंद्रामधून अतिरिक्त ३३ केव्ही एच.टी. लाईन	३९	किमी	१८.३
४	नरीमन पॉईंट संग्राही केंद्र (११० केव्ही) उपकरणे बदलणे, अग्निशमन यंत्रणा, नवीन संग्राही उपकेंद्र, संग्राही उपकेंद्राची उपकरणे बदलणे, ए.डी.पी. बदलणे व इतर	-	-	१६२.३९
	या घटकांतर्गत खर्च :-रु.४३०.६३ कोटी			

(४) क्षमता निर्मिती (Capacity Building) - रु.०.८१ कोटी.

(क) योजने अंतर्गत एकूण प्रकल्प खर्च (DPR):-

(रु.कोटी)

अ.क्र.	कामे	खर्च
१	स्मार्ट मिटरिंग	७०८.५४
२	वितरण हानी कमी करणे	२३२१.००
३	प्रणाली आधुनिकीकरण	४३०.६३
४	क्षमता निर्मिती	०.८१
	एकूण खर्च	**३४६०.९८**

(ड) बेस्ट उपक्रमाद्वारे निश्चित केलेला व राज्यशासनाने मान्य केलेला कृती आराखडा:- AT & C Loss Reduction & ACS-ARR Gap Reduction :-

AT & C Loss %	Base year	उद्दिष्टे			
	FY २०-२१	FY २१-२२	FY २२-२३	FY २३-२४	FY २४-२५
	६.६४	६.६४	६.५५	६.५०	६.४५
ACS-ARR Gap (Rs./KWH)	१.११	०.१५	०.१४	०.०९	०.००

केंद्रशासनाच्या मार्गदर्शक सुचनांनुसार RDSS योजना राज्यात महावितरण व बेस्ट उपक्रमामार्फत त्यांच्या त्यांच्या कार्यक्षेत्रात राबविण्यासाठी महावितरण व बेस्ट उपक्रमामार्फत तयार करण्यात आलेला सविस्तर प्रकल्प अहवाल (DPR) व कृती आराखडा (Action Plan) राज्य शासनाच्या मान्यतेने केंद्रशासनास पाठविण्याचे विचाराधीन होते. त्याअनुषंगाने शासनाने खालीलप्रमाणे निर्णय घेतले आहेत:-

शासन निर्णय :-

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DPR Action plan

www.maharashtra.gov.in या संकेतस्थळावर उपलब्ध करण्यात आला असून त्याचा सांकेतांक क्रमांक २०२२०८२५१५०३५००९१० असा आहे. हा आदेश डिजीटल स्वाक्षरीने साक्षांकीत करुन काढण्यात येत आहे.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नांवाने,

(प्र. पुं. बडगेरी)
उप सचिव, महाराष्ट्र शासन

प्रत,

१. मा.राज्यपाल यांचे प्रधान सचिव
२. मा. मुख्यमंत्री यांचे प्रधान सचिव

३. मा. उपमुख्यमंत्री यांचे खाजगी सचिव
४. मा. विरोधी पक्षनेता, विधानसभा/विधान परिषद, विधानमंडळ सचिवालय, विधानभवन, मुंबई-३२.
५. मा.मंत्री (ऊर्जा) यांचे खाजगी सचिव
६. मा.राज्यमंत्री (ऊर्जा) यांचे खाजगी सचिव
७. मा .मुख्य सचिव, मंत्रालय, मुंबई-३२.
८. अपर मुख्य सचिव (वित्त विभाग), मंत्रालय, मुंबई-३२.
९. अपर मुख्य (नियोजन विभाग),मंत्रालय, मुंबई-३२.
१०. अपर मुख्य सचिव/प्रधान सचिव/ सचिव, सर्व मंत्रालयीन विभाग, मंत्रालय, मुंबई-३२.
११. अध्यक्ष तथा व्यवस्थापकीय संचालक, महाराष्ट्र राज्य विद्युत वितरण कंपनी, प्रकाशगड,बांद्रा, मुंबई-५१
१२. महाव्यवस्थापक, बेस्ट उपक्रम, बेस्ट भवन, बेस्ट मार्ग, कुलाबा, मुंबई-४०० ००१.
१३. महालेखापाल (लेखा व अनुज्ञेयता), महाराष्ट्र-१, मुंबई / महाराष्ट्र-२, नागपूर.
१४. महालेखापाल (लेखापरीक्षा),महाराष्ट्र-१, मुंबई.
१५. अधिदान व लेखा अधिकारी, मुंबई.
१६. निवासी लेखापरीक्षा अधिकारी, मुंबई.
१७. अवर सचिव (ऊर्जा-३), उद्योग,ऊर्जा व कामगार विभाग, मंत्रालय, मुंबई-३२.
१८. कक्ष अधिकारी, (अर्थसंकल्प/व्यय-१६), वित्त विभाग, मंत्रालय, मुंबई-३२.
१९. कक्ष अधिकारी (नियोजन विभाग),मंत्रालय, मुंबई-३२
२०. निवड नस्ती (ऊर्जा-५), उद्योग, ऊर्जा व कामगार विभाग, मंत्रालय, मुंबई-३२.
२१. ऊर्जा विभागातील सर्व कार्यासने.

पावर फाइनेंस कॉर्पोरेशन लिमिटेड
POWER FINANCE CORPORATION LTD.
(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)
(आई.एस.ओ. 9001:2015 प्रमाणित) (ISO 9001:2015 Certified)

150 YEARS OF CELEBRATING THE MAHATMA

02:10: RDSS: 2021: I: BEST 21.11.2022

The Principal Secretary
Department of Energy, Govt. of Maharashtra,
3rd Floor, Main imarat, Madamkama Road,
Huttama Rajguru Chowk Mantralaya,
Mumbai Maharashtra - 400032

Sub: Financial assistance to BEST for implementation of Projects under Revamped Distribution Sector Scheme (RDSS) of Govt. of India in the State of Maharashtra.
Grant No. 21981001 (RDSS Metering Works)
Grant No. 21982001 (RDSS Loss Reduction Works)
Grant No. 21984S01 (RDSS PMA for Smart Metering Works) and
Grant No. 21984L01 (RDSS PMA for Loss Reduction Works)

Sir,

1. With reference to BEST letter dated 22.08.2022 regarding financial assistance under Revamped Distribution Sector Scheme (RDSS), we are pleased to convey that Monitoring Committee for RDSS constituted under the Chairmanship of Secretary (Power), Govt. of India, in its 13th meeting held on 28.10.2022 has approved the Action plan and Detailed Project Report (DPRs) for Loss Reduction works and Prepaid Smart Metering works of Brihanmumbai Electricity Supply and Transport Undertaking (BEST) under RDSS scheme as per below mentioned details:

   a) Results Evaluation Matrix for BEST as enclosed at **Annexure A** along with pre-qualifying criteria.
   b) DPR for Prepaid Smart metering works with total Project Cost of Rs. 659.17 Cr with Government Budgetary Support (GBS) of Rs. 146.69 Cr including incentive for Phase-I as per details in **Annexure B**.
   c) DPR for Infrastructure– Loss reduction works with total Project Cost of Rs. 972.88 Cr with GBS of Rs. 583.73 Cr as per details in **Annexure C**.
   d) Project Management Agency (PMA) charges of Rs. 17.07 Cr for Prepaid Smart Metering works and Infrastructure- Loss reduction works with GBS of Rs. 10.24 Cr as per details in **Annexure D**.

   Summary of approved projects cost and GBS for Projects and PMA is attached at **Appendix-I**.

2. **Funding Pattern:**

   a. The funding Pattern for BEST in the State of Maharashtra is given below:

Item Description	GBS % (Max)
Prepaid Smart metering solution at consumer, DT, and feeder level including integration of existing infrastructure	15% of the approved cost of metering including the operational cost, provided that it is not more

पंजीकृत कार्यालय : "ऊर्जानिधि", 1, बाराखंबा लेन, कनॉट प्लेस, नई दिल्ली - 110001 दूरभाष : 23456000 फैक्स : 011-23412545
Regd. Office : "Urjanidhi", 1, Barakhamba Lane, Connaught Place, New Delhi-110001 Phones : 23456000 Fax : 011-23412545
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	than Rs. 900 per meter for consumer metering only.
Distribution Infrastructure works	60% of the approved cost of Distribution infrastructure works
PMA Charges for Metering and Infrastructure works	60% of the approved cost of PMA

b. The project cost approved by the Monitoring Committee or actual cost incurred whichever is less, shall be the eligible cost for determining the grant under the scheme for Infrastructure works and PMA Components. Any cost overrun after approval of the project by Monitoring Committee due to any reason whatsoever shall not be eligible for any grant and shall be borne by the BEST/respective State Government.

c. The release of GBS by Government of India will be subject to prescribed scheme guidelines and would be contingent to award of prepaid smart metering works & its satisfactory progress.

3. The terms and conditions of the sanction are as given below:

a) BEST to ensure implementation of the scheme in accordance with all the prescribed scheme guidelines (including SBDs).

b) **Prepaid Smart Metering works:**

i. DISCOM to submit the timelines for completing ongoing Smart Metering works. Further nodal Agency to ensure that timelines for completing Smart Metering (both Consumer and System metering) are adhered to and all consumers in the State/ DISCOM area are covered under Smart Metering within these timelines as per scheme guidelines.
ii. Funding under Metering component will be available only to Prepaid smart meters operating in prepayment mode for consumers, and in accordance with the uniform approach indicated by the Central Government, with implementation in OPEX/TOTEX mode.
iii. The Grant for smart metering works would be released in three equal yearly instalments subject to fulfilment of performance criteria including prescribed SLAs. Further, the grant per meter would also be rationalized considering exclusion of MDM from the scope of AMISP.
iv. A feeder and DT level automated online energy accounting system shall be put in place.
v. All feeders are to be metered with communicable & AMI/AMR meters by 31st December 2022, and shall be integrated with the National Feeder Monitoring System (NFMS) proposed to be put in place shortly.
vi. BEST to complete 100% DT Metering in Phase - I areas by March 2023 and in remaining areas by December 2023 to facilitate energy accounting.
vii. BEST while implementing the prepaid smart metering projects, shall ensure that the remotely readable metering at DT level; Consumer indexing; integration of feeder level data; and the consumer billing database under the AMI contracts are prioritised to be completed latest by March 2023.
viii. Prepaid Smart Meters may be installed outside the consumer premises, may be pole mounted, ground mounted panels, incoming service cables that may be armoured etc.

c) **Infrastructure works & PMA Charges:**

i. All feeders segregated for Agriculture should be solarized under the PM- KUSUM scheme of MNRE or any other similar scheme of State Government.
ii. BEST to carry out feeder level analysis to identify high loss feeders for reduction of losses through appropriate measures proposed in the DPR. The details of such feeders to be included in the DPR and submitted to Nodal Agency to verify the same. Feeder level analysis should be completed as early as possible but within 90 days of sanction.
iii. PMA charges over and above the permitted amount shall be borne by the BEST/ State Government.
iv. Also, services of PMA shall be retained up to completion of the project, without any financial implications beyond that already provided.
v. The Monitoring committee has advised nodal agency to review the tender documents already floated by the BEST in accordance with the respective SBD's. The fund release under RDSS shall be subject to compliance of RDSS guidelines and provisions of SBD's. Some minor deviations may be allowed subject to approval of Nodal Agency and Monitoring Committee.

The detailed terms & conditions of sanction letter is enclosed as **Annexure E**.

4. **Result Evaluation Matrix and pre-qualifying criteria:**

a) The AT&C losses and ACS-ARR Gap trajectories approved by Monitoring Committee are as given below:

Parameter	**Units**	**Max marks**	**Base Year**	**Baseline values**	**Targets**			
					FY 2022	**FY 2023**	**FY 2024**	**FY 2025**
ACS-ARR Gap								
(i) On Cash Basis	Rs./ kWh	**30**	**2021**	**0.94**	**0.30**	**0.20**	**0.10**	**0**
(ii) On subsidy received basis,				**0.705**	**0.15**	**0.15**	**0.09**	**0**
AT&C loss	%	**30**	**2021**	**8.18%**	**8.00%**	**7.80%**	**7.60%**	**7.50%**

b) BEST to mandatorily meet the pre-qualifying criteria and achieve the specified marks in the Evaluation Matrix based on which DPR for Modernisation & System Augmentation shall be sanctioned and grant for both loss reduction works (other than the advance for DPR for Loss Reduction) and for the Modernisation & System Augmentation works will be released.
c) BEST to ensure timely adoption of all suitable measures to meet the prequalifying criteria and to score at least 60% marks on the agreed Result Evaluation Matrix.
d) If by the end of year 2025-26, the BEST is not eligible for release of any grant, the initial advance of 10% of the grant component of the cost of DPR for Loss Reduction will have to be refunded by the DISCOM.

e) Approval of the Competent Authority shall be taken for changes in Action Plan made after approval of the Cabinet in accordance with direction of RDSS Monitoring Committee/ MOP/ Nodal Agency.

5. **Fund Management:**

a. BEST shall ensure that funds released under the scheme are utilized for the purpose for which it is released and will not be diverted for any other purposes whatsoever. The grant release from Nodal Agencies to the BEST shall be done through PFMS and the BEST shall use PFMS for fund flows to the lowest level as specified by the Government of India's instructions on the subject under the scheme.
b. BEST shall submit utilization certificates (UC) for the funds released during the financial year in prescribed format latest by 30th April of succeeding year in addition to the UC along with every claim.
c. For release of funds under the Scheme, BEST has to ensure updation of baseline data, physical & financial progress, Quality Monitoring, Fund Management, Asset identification through Geo-tagging, outcomes and achievements for evaluation under Result Evaluation Framework, closure, etc. on the digital platform to be developed by the Nodal Agencies.
d. For works other than metering works under Part A, counterpart funding will be provided by the BEST/ State Government. If BEST takes loan for counterpart funding, such loan will be taken from REC and PFC only. Further, counterpart funding from bilateral/multilateral funding agencies can also be leveraged for which the Government of India would extend benefits of reduced Government Guarantee fee.
e. In case loan component of the project cost is funded by the NBFCs under MoP, then in order to secure the loan, the existing TPA (Tri-partite Agreement) arrangement among Government of India, the State Government and the RBI shall be suitably amended to provide that the loan servicing payments in case of default can be recovered through RBI.

6. A Scheme Implementation Agreement will be signed between the Government of Maharashtra, BEST and Nodal Agency on behalf of MoP within 30 days of issuance of sanction letter. Copy of approved agreement format is attached at **Appendix-II**.

7. The Monitoring Committee is empowered to recall the grant released to the BEST at any stage of the scheme, in case the sanctioned works are left incomplete, or the assets could not be put to use, or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines.

8. BEST to undertakes to seek full authorization by way of its Resolution passed in subsequent meeting of its Board / State Govt. in order to implement the RDSS Scheme on the said terms and conditions to the satisfaction of the Government of India / Nodal Agency.

9. Any unrecovered/ outstanding dues amounts of earlier Schemes of Ministry of Power, GOI shall also be allowed to be adjusted against releases in the current scheme.

10. It is requested to kindly acknowledge and accept the sanction letter within 15 days from the date of issue of this sanction letter as per the acceptance letter enclosed as **Annexure- F**.

11. The appointment of PMA and/or PIA, if any, should be in line with the RDSS Guideline and MoP letter dated 18th May 2022 & subsequent amendment thereof.

12. District wise and Project area wise bifurcation of work and project cost approved for Infrastructure – Loss reduction works etc. is to be submitted by BEST within 15 days of the issuance of the 13th MCM minutes as per the requirement of MOP/ Nodal Agency.

13. The sanction is subject to undertaking / commitment and implementation by BEST of the SOP issued by Ministry of Power as mentioned in para (o) of the decisions mentioned in minutes of 13th meeting of Monitoring Committee for RDSS.

Yours sincerely,

Encl: As Above

Saurav Kumar Shah
Executive Director
for **Power Finance Corporation**

Copy to:

1. Chairman & Managing Director, Brihanmumbai Electricity Supply and Transport Undertaking, BEST Bhawan, BEST Marg , Colaba, Mumbai, Maharashtra - 400001.
2. Joint Secretary (Distribution), MoP, Shram Shakti Bhawan, Rafi Marg, New Delhi-110001

Result Evaluation Framework for BEST (Maharashtra) **Annexure A**

S No.	Result Parameter	Units	Maximum Marks	Base Year and Baseline values (FY2021)	Targets			
					FY2022	FY2023	FY2024	FY2025
A	**Financial Stability (60% weightage; 65% in 1st year)**							
1	ACS-ARR Gap – Cash basis	Rs./ kWh	30	0.94	0.30	0.20	0.10	0.00
	ACS-ARR Gap – Subsidy received basis			0.705	0.15	0.15	0.09	0.00
2	AT&C loss	%	30	8.18	8.00	7.80	7.60	7.50
3	Outstanding/ Overdue Government Dues	Rs. Crore	15	41.43	30	20	10	0
4	Progress in putting Govt. Offices on prepaid meters (Total: 7634 Nos.)	%	15	0%	0%	5%	100%	100%
5	No. of creditor days (including payment to Gencos for supply of power)	Days Payable	5	9.5	Less than 45 days			
6	No. of debtor days	Days Receivable	5	53.5	Less than 45 days			
			100					
B	**Outcomes of Infra works (20% weightage)**							
1	Hours of supply (Urban)	Avg. Hours/ Day	20	23:53	23:54	23:55	23:56	23:57
2	%age of Feeder Level Energy accounting being published - BEE	%	20	0	0%	100%	100%	100%
3	%age of DT Level Energy accounting being published	%	20	0	0%	100%	100%	100%
4	Reliability of power supply - SAIFI (System Average Interruption Frequency Index)	Nos/ Year	20	2.63	2.50	2.25	2.0	1.50
5	Data availability in the National Feeder Monitoring System / NPP	%	20	0	0%	100%	100%	100%
			100					
C	**Infrastructure Works (10% weightage)**							
	Metering							
1	Consumer Metering [Target : 10,44,000]	%	20	0%	0%	25%	99%	100%

2	DT Metering [Target : 3356]	%	20	0	0%	100%	100%	100%
3	Feeder Metering [Target : 1239]	%	20	0	0%	100%	100%	100%
4	% of Consumers with Prepaid Smart Meters (other than Govt. Dept.)	%	15	-	-	15%	55%	100%
5	Augmentation of substations (add/ replace of DT's) – (Target : 666 Nos)	Nos	15	-	-	35	400	666
6	Replacement of weak/Old UG cables (33, 11KV & 22KV) to improve the quality of supply (Target : 373 Km)	Kms	10	-	-	35	180	373
			100					
D	**Policy and Structural Reforms (10% weightage)**							
1	SCADA	No. of Towns/ %	25	-	0	0%	100%	100%
3	ERP Implementation & Billing Module (Target: 6 Modules)	Yes/ No	25	0	0	0	3	6
4	Training of Discom Officials	Mandays	20	0	0	800	800	800
5	DT Failure rate	%	15	0.54	0.54	0.50	0.45	0.45
6	Digital Payments : as a % of total revenue collected	%	15	64%	65%	67%	70%	75%
			100					

Smart Metering DPR (BEST- Maharashtra) **Annexure – B**

Sl No.	Major Component	Item Particulars	Expected Life cycle unit cost (Rs. per meter)	Quantity (Phase I)	Quantity (Phase II)	Total Quantity	Estimated cost in Rs. Crores
				No.	No	Nos.	
(1)	(2)	(3)	(4)	(5)	(6)	(7) = (5)+(6)	(8) = (4)x(7)
1	**Consumer Metering**						
1.1		1 Phase Whole Current Smart Consumer Meter	6,000	8,90,071	11,131	9,01,202	**540.72**
1.2		3 Phase Whole Current Smart Consumer Meter	6,000	1,66,339	2,080	1,68,419	**101.05**
1.3		3 Phase LT-CT Operated Smart Consumer Meter	6,000	5,978	75	6,053	**3.63**
1.4		3 Phase CT-PT Operated HT Smart Consumer Meter	6,000	204	3	207	**0.12**
	Sub-Total			**10,62,592**	**13,289**	**10,75,881**	**645.53**
2	**DT Metering***	3 Ph LT-CT Operated DT Meter	23,000	3,356	42	3,398	**7.82**
3	**Feeder Metering**	3 Ph CT-PT Operated feeder Meter	42,000	1,239	16	1,255	**5.27**
4	**Boundary Metering**	3- phase CT/PT operated Boundary meter	42,000	131	2	133	**0.56**
	Total			**10,67,318**	**13,349**	**10,80,667**	**659.17**
	Total GBS excluding incentive for Phase – I						**98.88**
	Incentive for Phase – I						**47.82**
	Total GBS including Incentive of Phase - I						**146.69**

***100% DT metering to be completed by December 2023**

Infrastructure works under Loss Reduction (BEST-Maharashtra) **Annexture C**

S.No.		Description	Unit	Unit Cost (in Rs Lakhs)	Qty.	Total Cost (in Rs. Crore)
A	**ERP, Billing Software and IT/OT enablement works**					
	1	New MBC solution (SaaS mode)	LS	2259.00	1	22.59
	2	ERP Solutions incl. License cost & Implementation cost etc. (MM, FICO, HCM, AM, DMS, BI/BW)	LS	3219.00	1	32.19
	3	Infrastructure Hardware (IaaS) Cost for ERP deployment	LS	870.00	1	8.70
	4	Network connectivity across all sites, head office and central cloud infrastructure	LS	667.00	1	6.67
	5	Complete setup of centralized Customer Call Centre	LS	221.00	1	2.21
	6	Contingency Charges@5% of Project Cost	LS	362.00	1	3.62
		Sub Total (A)				**75.98**
B	**Implementation of SCADA & DMS**					
	1	**Implementation of SCADA & DMS**	LS	14372.00	1	143.72
		Sub Total (B)				**143.72**
C	**Replacement of old Switchgear**					
	1	Replacement of 33 KV, 1500MVA Switchgears with relays	Nos.	17.32	19	3.29
	2	Replacement of 11 kV, 350MVA Switchgears with relays at RSS (10 switchgear per panel)	Panels	63.06	32	20.18
	3	Replacement of 11 kV OCB Switchgears by VCB Switchgears at DSS (No. given of DSS)	Nos.	21.40	396	84.74
	4	Replacement of Oil Ring Main Unit by SF6 Ring Main Unit	Nos.	8.23	95	7.82
		Sub Total (C)				**116.03**

D	**Renovation /Augmentation of Infrastructure at Power/Receiving Substations**					
	1	Additional / Replacement of Transformer (Power Transformer) - 16/ 20 MVA ONAN/ONAF	Nos.	251.16	20.00	50.23
		Sub Total (D)				**50.23**
E	**Renovation /Augmentation of Infrastructure at Distribution Substations**					
	1	Augmentation of substations (additional / replacement of Distribution transformer (995 KVA) along with Breakers/Cable)	Nos.	28.95	666	192.80
	2	No of New RMUs	Nos.	8.23	104	8.56
		Sub Total (E)				**201.36**
F	**Renovation /Augmentation of HV and LV lines**					
	1	Replacement / Additional of 33KV, with 3cx 300 sq.mm Cu. XLPE Cables	Kms	132.68	120	159.22
	2	Replacement / Additional of HV weak/Old cable with 3C X 240 SQ. MM XLPE AL. cables	Kms	63.24	203	128.38
	3	Replacement / Additional of LV weak/Old cable with LV 4C X 300 SQ. MM XLPE AL. cables	Kms	50.86	50	25.43
		Sub Total (F)				**313.03**
G	**Auxiliary component cost for Consumer metering**					
	1	Auxiliary component cost for Consumer metering (Single pole MCB, Copper service cable etc)	NOS	0.01	523357	**72.53**
		Sub Total (G)				
	Total Cost of Loss Reduction in Crs. (A+B+C+D+E+F+G)					**972.88**
	Total GBS @ 60%					**583.73**

Details of PMA Charges (BEST Maharashtra) **Annexure – D**

Sl. No.	Particulars	Total Project Cost	GBS*	PMA Charges**	GBS for PMA Charges***
1	Smart Metering Works	659.17	98.88	2.47	1.48
2	Infrastructure Works – Loss Reduction	972.88	583.73	14.59	8.76
	Total	**1632.05**	**682.60**	**17.07**	**10.24**

* Excluding incentives in case of Smart Metering works of Phase-I.
** 2.5% of GBS for Smart Metering (excluding incentive) and 1.5% of total project cost for Infrastructure works.
*** 60% of PMA Charges.

Appendix-I

Approved DPR Cost and Government of India (GoI) Grant for BEST, Maharashtra

All amount in Rs. Cr.

Sl. No.	Grant No.	Name of the Project	Approved Project Cost	GoI Grant* Sanctioned	Additional Incentive** for Phase-I Smart Metering (GoI Grant)
1	21981001	RDSS Smart Metering Works	659.17	98.88	47.82
2	21984S01	RDSS PMA Grant for Smart Metering works	2.47	1.48	NA
Total			**661.64**	**100.36**	
3	21982001	RDSS Loss Reduction Works	972.88	583.73	NA
4	21984L01	RDSS PMA Grant for Loss Reduction Works	14.59	8.76	NA
Total			**987.47**	**592.49**	
Grand Total			**1649.11**	**692.85**	**47.82**

** 15% of the approved cost of the metering including the operational cost, provided that it is not more than Rs. 900 per meter for consumer metering only.*

*** Maximum incentive GBS for deployment of prepaid Smart meters by December, 2023- 7.50% of the cost per consumer meter including operational cost or Rs. 450 per consumer meter, whichever is lower*

General Terms and Conditions Applicable for Availing Financial Assistance under Revamped Distribution Sector Scheme

The terms and conditions of financial assistance as set out here under shall be binding on the DISCOM and State Government in accordance with the Scheme Implementation Agreement to be executed amongst PFC (on behalf of MoP), State Government & State Discom.

A. Project Financing & Fund Management:

1. The funding pattern under the scheme is as given below:

Part	Item Description	GBS % (Max)
Part A	Component I: Prepaid Smart consumer metering solution including Communicable/Smart System Metering at DT, feeder and boundary level including integration of existing infrastructure.	15% / 22.5% of meter lifecycle cost as the case may be (limited up to Rs.900 or Rs.1350 respectively per meter for Consumer metering only)
	Component II: Distribution Infrastructure works including SCADA, DMS, AB cables, feeder segregation etc.	60% or 90% of project cost as the case may be

2. The project cost approved by the Monitoring Committee or actual cost incurred whichever is less, shall be the eligible cost for determining the grant under the scheme for Component II and III of Part A. Any cost overrun after approval of the project (by Monitoring Committee) due to any reason whatsoever shall not be eligible for any grant and shall be borne by the DISCOM/respective State Government.

3. Part A: Component I- Metering:

3.1. The operation and maintenance cost of the meter over the life of the meter as per the SBD shall be included in the project cost.

3.2. Prepaid Smart metering for consumers, and System metering at Feeder and Distribution Transformer level with communicating feature along with associated Advanced Metering Infrastructure (AMI) will be done in TOTEX mode through PPP, to facilitate reduction of Distribution losses and enable automatic measurement of energy flows and energy accounting as well as auditing in line with the BEE regulations which will help in identifying high loss packets.

3.3. Funding under Metering component of Part A will be available only if the DISCOM agrees to the operation of smart meters in prepayment mode for consumers, and in accordance with the uniform approach indicated by the Central Government, with implementation in TOTEX mode. Pre-paid smart metering works carried out after 1st January, 2020 will be eligible for funding, if they were carried out in TOTEX mode, after obtaining approval from Monitoring Committee in this regard

3.4. In areas which do not have communication network, installation of prepayment meters, may be taken up.

3.5. The financial support for Metering Component under Part A of the scheme shall be as under:

General Terms and Conditions Applicable for Availing Financial Assistance under Revamped Distribution Sector Scheme

3.5.1. *Other than Special Category States:* 15% of the project cost of the metering works including the operational cost, limited upto Rs. 900 per meter for consumer metering only would be provided as grant by Government of India. Further, an incentive @ 7.5% of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter, whichever is lower, would be for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023.

3.5.2. *Special Category States (All North Eastern States including Sikkim, Himachal Pradesh & Uttarakhand and union Territories of Jammu & Kashmir, Ladakh, Andaman & Nicobar Islands & Lakshadweep)*: 22.5% of the project cost of the metering works including the operational cost, limited upto Rs. 1350 per meter for consumer metering only would be provided as grant by Government of India. Further, an incentive @ 11.25% of the cost per consumer meter worked out for the whole project or Rs. 675 per consumer meter, whichever is lower, would be for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023.

4. Part A: Component II- Distribution Infrastructure works:

4.1. The eligible project cost shall include Central taxes and all fees like forest clearance, highway and railway crossing fee etc. The project cost shall however not include the cost of land, cost of buildings other than sub stations and anti-theft police stations, service lines to new consumers, compensation towards ROW (except forest clearance, highway and railway crossing fee), office equipment & fixtures, spares (other than mandatory spares prescribed by manufacturer), T&P, road cutting charges, vehicles and salaries and establishment expenditure. Further, the project cost shall be reduced to the extent of any Liquidated Damages actually levied, but the encashment of performance security or bid security (EMD) shall not reduce the project cost.

4.2. Feeders having significant agricultural load (30% or more) may be considered for separation under the loss reduction part of DPR and the same should also be proposed for solarization under the PM- KUSUM scheme of MNRE or any other scheme of Government.

4.3. Discom to submit feeder wise analysis of high loss feeders being taken up on priority under loss reduction works, within the 3 months of sanction to Nodal Agency.

4.4. The financial support for Part A: Component II under the scheme shall be as under:

4.4.1. Other than Special Category States:

a) 60% of project cost of works other than metering works under Part A and approved cost of PMA would be provided as grant by Government of India.

b) 40% of project cost of works and approved cost of PMA shall be arranged through own sources of State Government/ Utility or may avail loan from PFC & REC. Funding from bilateral/multilateral funding agencies can also be leveraged for which the Government of India would extend benefits of reduced Government Guarantee fee.

4.4.2. Special Category States (All North Eastern States including Sikkim, Himachal Pradesh & Uttarakhand and union Territories of Jammu & Kashmir, Ladakh, Andaman & Nicobar Islands & Lakshadweep) *a)* 90% of project cost of works and approved cost of PMA would be provided as grant by Government of India.

b) 10% of project cost of works and PMA works shall be arranged through own sources of State Government/ Utility or may avail loan from PFC & REC. Funding from bilateral/multilateral funding agencies can also be leveraged for which the Government of India would extend benefits of reduced Government Guarantee fee.

5. Part A: Component III- Project Management:

5.1. 2.5% of the GBS of metering component and 1.5% of project cost of Distribution infrastructure works component, shall be allowed as PMA charges under the Scheme. PMA charges, over and above the permitted amount shall be borne by the respective DISCOM / State government.

5.2. 60% of the PMA charges allowed under the scheme for metering and Distribution infrastructure work components would be provided as grant by Government of India for other than Special Category States. For Special Category States, Government of India grant would be 90% of the allowed PMA charges.

5.3. Services of PMA shall be retained up to physical completion of the project, without any financial implications beyond that already provided

6. Release of grant to Discom by PFC:

6.1. Release of grant for Metering:

a) Grant for metering works, will be due when a meter is successfully installed and commissioned, and essential services and data related to it are provided for a period of one month to the DISCOM. It will be essential that a consumer meter is recharged at least once, for the release of grant pertaining to it to become due.

b) The DISCOM may submit claim for release of grant in a phased manner when grant becomes due against 5% of the total meters planned to be installed, or such number of meters or such period that the Nodal Agencies deem practical and convenient. After the first release, subsequent releases shall be subject to submission of utilization certificate of the previous releases.

6.2. Release of grant for Distribution Infrastructure works:

6.2.1. **Phase I- 10% of the grant for Loss reduction part of Project** (5% on sanction and further 5% on award of works)

a) Approval of the project by the Monitoring Committee
b) Execution of Scheme Implementation agreement

6.2.2. **Phase II**
30% of the grant for Loss reduction part of project in FY 2022-23 (including the advance 10%):

a) Qualification as per the Results Evaluation Framework of the Action Plan for FY 2021-22.
b) Submission of a certificate regarding utilization of grant already released in the Format prescribed by Ministry of Finance;

c) Submission of a certificate regarding receipts and expenditure on the project certified by a Chartered Accountant ;
d) Submission of physical and financial (grant and counterpart funding) progress report;
e) Sanction letter for counter-part funding / DISCOM's own resources / State Government funding for Distribution Infrastructure Works.
f) Award of prepaid Smart Metering works to be covered in the first phase to be completed by December 2023, as per the clause 3.2.2.2 of scheme guidelines.

30% of the grant for Modernization & System Augmentation part of project in FY 2022-23 (10 % on sanction and 20% on award of works.)

a) Approval of the project by the Monitoring Committee
b) Execution of Scheme Implementation agreement
c) Award of prepaid Smart Metering works to be covered in the first phase to be completed by December 2023, as per the clause 3.2.2.2 of scheme guidelines.

6.2.3. **Phase III: Cumulative release of 60% of grant component of the project cost of DPRs in FY 2023-24:**

a) Qualification as per the Results Evaluation Framework of the Action Plan for FY 2022-23.
b) Submission of a certificate regarding utilization of grant already released in the Format prescribed by Ministry of Finance;
c) Submission of a certificate regarding receipts and expenditure on the project certified by a Chartered Accountant;
d) Submission of physical and financial (grant and counterpart funding) progress report;
e) Sanction letter for counter-part funding / DISCOM's own resources / State Government funding for Distribution Infrastructure Works.

6.2.4. **Phase IV: Cumulative release of 95% of grant component of the project cost of DPRs in FY 2024-25:**

a) Qualification as per the Results Evaluation Framework of the Action Plan for FY 2023-24.
b) Submission of a certificate regarding utilization of grant already released;
c) Submission of a certificate regarding receipts and expenditure on the project certified by a Chartered Accountant;
d) Submission of physical and financial (grant and counterpart funding) progress report;
e) Sanction letter for counter-part funding / DISCOM's own resources / State Government funding for Distribution Infrastructure Works.

6.2.5. **Cumulative release of 100% of grant component of the project cost of DPRs in FY 2024-25:**

a) Submission of project completion report as per clause 4.9.1 of scheme guidelines.

6.2.6. Release of grant for PMA

Grant for PMA component shall be released, subject to the following conditions:
(i) Grant shall be released on the basis of the sanctioned cost or award cost, whichever is lower;

(ii) Grant will be released in the month of March, every year;
(iii) 10% shall be released as advance in the year of sanction;
(iv) 30% shall be released each year subsequent to the sanction year;
(v) Subsequent releases shall be subject to submission of utilization certificate of the previous releases and achievement against deliverables as specified in the SBD referred to in Clause

Discoms shall comply the amendments/supplemental to conditionalities prescribed for release of particular installment, if any, issued by MoP/PFC in future.

7. If DISCOM achieves the targets as per Action Plan of any previous FY in a subsequent year, then it shall be eligible for release of grant pertaining to that FY.

8. DISCOM (Implementing Agency) shall open an Assignment Account with NDRO, Reserve Bank of India (RBI) as Sub Agency for implementation of the RDSS through PFC (Central Nodal Agency) or as per the latest policy/ guidelines/ directives issued by Ministry of Power from time to time. All project related payments to the contractors/ agencies by DISCOM shall be done directly from the Assignment Account with RBI.

9. Regarding counterpart funding, DISCOM shall open a dedicated scheme account in a nationalized bank having E-banking facility or as per directions issued by MoP/ Nodal Agency. MoP/ Nodal Agency shall have the view right of the said Bank Account.

10. Any interest earned on grant shall be remitted to Ministry of Power's bank account on regular basis and at least once in a quarter.

11. Since grant under the scheme is Central Government money and DISCOMs are only the custodian of this money, income tax is not payable on interest earned on this money. DISCOMs shall take necessary steps to seek exemption from Income Tax Department regarding deduction of Tax at Source by the bank on interest accrued on un-utilized fund under the scheme. However, in case of deduction of TDS by bank, the Utilities shall claim refund of the deducted amount from Income Tax Department directly while filing annual tax return and remit it to Ministry of Power's account.

12. The Discom shall ensure that funds released under the scheme are utilized for the purpose for which it is released and will not be diverted for any other purposes whatsoever. In case of any breach or deviation further release of funds shall be stopped.

13. The grant release from Nodal Agencies to the DISCOMs shall be done through PFMS and the DISCOMs shall use PFMS for fund flows under the scheme. DISCOMs receiving funds under the scheme are to be registered / mapped in PFMS. The DISCOMs shall mandatorily enter details like receipts, expenditures, etc in Public Fund Management System (PFMS) portal. In case of non-entering desired details in PFMS portal, banks may not consider release of funds to Contractors.

14. DISCOM shall submit utilization certificates (UC) for the funds released during the financial year in prescribed format latest by 30th April of succeeding year in addition to the UC along with every claim.

15. DISCOMs shall maintain books of accounts both for receipt of funds from Nodal Agency and release to contractors for each of the project. The DISCOM shall ensure that fund shall not be invested in any other bank/branch, whether for short term or medium term, including fixed deposits.

General Terms and Conditions Applicable for Availing Financial Assistance under Revamped Distribution Sector Scheme

16. The DISCOM will ensure audit of the scheme accounts relating to receipts of funds from GoI / Nodal agency and expenditure incurred by the DISCOM against such receipts during the financial year by an independent Chartered Accountant and furnish a report to the Nodal agency latest by 30th June of the succeeding year.

17. The works and finances would be open to audit by the office of the Comptroller & Auditor General of India (C&AG) as well as Internal Audit Wing, Office of Controller of Accounts, MoP

18. **Recall of Grant:**

    18.1. If by the end of year 2025-26, a DISCOM is not eligible for release of any grant, the initial advance of 10% of the grant component of the cost of DPR for Loss Reduction will have to be refunded by the DISCOM.

    18.2. The Monitoring Committee is empowered to recall the grant released to the DISCOMs at any stage of the scheme, in case the sanctioned works are left incomplete, or the assets could not be put to use, or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines.

    18.3. Any unrecovered/ outstanding dues amount from earlier Schemes of Ministry of Power, GoI shall also be allowed to be adjusted against releases in the current Scheme.

19. In case loan component of the project cost is funded by the NBFCs under MoP, then in order to secure the loan, the existing TPA (Tri-partite Agreement) arrangement among Government of India, the State Government and the RBI shall be suitably amended to provide that the loan servicing payments in case of default can be recovered through RBI.

B. Project Implementation by Discom:

20. Mode of Implementation:

    20.1. **Metering**: These projects shall be implemented in TOTEX mode (Total expenditure includes both capital and operational expenditure) with the following options:

    a) Installation and commissioning of meters and cost recoveries in equated monthly instalments by PPP or implementation partner (or service provider) with no upfront payment by DISCOM

    b) Some initial payment shall be made to the service provider upon installation and commissioning of the meters, with the rest of the payments made on equated monthly / quarterly instalments over the operational period.

    20.2. **Distribution infrastructure works:** The projects shall be implemented normally on turnkey basis. However, certain works may be taken up on partial turnkey basis or departmentally with the approval of DRC and consent of Nodal Agency, subject to, overall guidance of the Monitoring Committee.

21. The scheme shall be implemented in accordance with the Ministry of Power's Office Memorandum No. 20/9/2019-IPDS dated 20th July, 2021, Scheme Implementation Agreement and operational guidelines issued including amendments/supplemental if any.

22. Discom to follow Standard bidding Document (SBD) as issued by Nodal Agencies for selection of AMI service provider, for Distribution infrastructure works, SCADA and PMA.

23. The DISCOMs may make minor changes in the SBD, while retaining its basic structure and essence, provided that the approval of the Nodal Agency is taken for the changes, subject to, overall guidance the Monitoring Committee

24. Prepaid smart Metering projects taken up by DISCOMs through MOU route with CPSUs or their JVs and Subsidiaries shall also be permitted subject to their being implemented in TOTEX mode as per proposed model circulated by Ministry of Power vide letter No. 14/07/2021- UR&S-II-(E-260509) dated 19.01.2022.

25. Keeping in view the aims and objectives of Atma Nirbhar Bharat Abhiyan, Ministry of Power has issued Public Procurement (Preference to Make in India) for Purchase Preference (linked with local content) Order in respect of Power Sector on 28.7.2020. This order is in line with the DPIIT Notification No. P-45021/2/2017-PP(BE-II) dated 4th June,2020. This order along-with amendments, if any, from time to time, shall be followed by the DISCOMs in the implementation of the scheme. However, in case a DISCOM is availing funds through multi-lateral financial institutions, applicable DEA directives may be followed.

26. Discom may appoint one or more PMA for project management. Existing PMA of DDUGJY or Saubhagya or IPDS or PMDP or any other Central/State Govt scheme of power sector may be used for preparation of DPR and Action Plan, and the expenses incurred will be eligible under the scheme. For all other works including bid process, monitoring of implementation, project completion, result evaluation and related works, a new PMA will have to be appointed as per the SBD as circulated by the Nodal agency. DISCOMs desirous of appointing CPSUs or their JVs and subsidiaries as PMA on nomination shall be required to obtain a specific approval from the Ministry of Power through concerned Nodal Agency. Any such proposal would be sent by the DISCOM along with the imperative need along with a detailed justification.

27. The sunset date for the scheme will be 31.03.2026, the works executed beyond which will not be eligible for release of Central Government grant.

28. Discom to ensure updation of MIS web portal to be developed by the Nodal Agencies for submission of Action Plan & DPRs, capturing baseline data, physical & financial progress, quality reports, outcomes and achievements for evaluation under Result Evaluation Framework, closure, etc.

C. Result Evaluation Framework:

29. Discom to meet the pre-qualifying criteria and achieve the specified marks in the Evaluation Matrix based on which DPR for Modernisation & System Augmentation shall be sanctioned and grant for both loss reduction works (other than the advance for DPR for Loss Reduction) and for the Modernisation & System Augmentation works will be released.

30. For qualifying in the Evaluation Matrix, a DISCOM needs to score a minimum of 60 marks.

D. Monitoring & Evaluation

31. This scheme would be reviewed by the District Electricity Committees, to be notified by the State Government in compliance to the notification of Government of India dated 16th Sept, 2021.

32. The DISCOM shall be responsible & accountable for assuring quality in the scheme works. Accordingly, DISCOM shall formulate a comprehensive Quality Assurance (QA) and Inspection Plan with an objective to build quality infrastructure under the project. The QA and Inspection Plan shall be an integral Part of the contract agreement with turnkey contractor or equipment supplier/vendor and erection agency as the case may be in case of partial turnkey and departmental execution of works. Documentation with regard to Quality Assurance & Inspection Plan shall be maintained by DISCOM and kept in proper order for scrutiny during the course of project execution and for future reference. The DISCOM has to ensure that the quality of

material/equipment supplied at site and field execution of works under the project is in accordance with Quality Assurance & Inspection Plan. DISCOM may use the MQP (Manufacturing Quality Plan) and FQP (Field Quality Plan) used in DDUGJY and IPDS schemes by suitably modifying as per requirement of this scheme.

33. In addition to the in-house quality checks and processes followed by the DISCOM, the nodal agency (PFC/ REC) shall carry out concurrent inspection of works through Third Party Quality Monitoring Agency (TPQMA).

E. Interpretation

Any dispute arising out of this Agreement/ interpretation of any clause may be referred to Secretary (Power), Govt. of India whose decision shall be final and binding on all parties. In case of any inconsistency between the Terms and Conditions of this sanction letter and the provisions of RDSS Guidelines, the latter shall prevail.

Appendix-II

[This MoA is to be executed on Non-Judicial Stamp Paper of Rs 200/-]

IMPLEMENTATION AGREEMENT AMONGST

_____ Limited, the Nodal Agency onbehalf of Ministry of Power,

Government of India

AND

State Government,

AND

Power Utility

For Implementation of Revamped Distribution Sector Scheme

This TRIPARTITE MEMORANDUM OF AGREEMENT (hereinafter referred to as the **"Implementation Agreement")** is made this .... day of ....20**....**

BY AND AMONGST

______ Limited, A Government of India Undertaking, having its Registered Office at ____________ (hereinafter referred to as "**Nodal Agency**" or "_____") part on behalf of Ministry of Power, Government of India, which expression shall unless it be repugnant to the subject or context thereof, include its successors and assigns, of the **FIRST PART;**

AND

State Government of....................... (hereinafter referred to as "**State Government**") which expression shall unless it be repugnant to the subject or context thereof, include its successors and assigns, of the **SECOND PART**

AND

.... *[Distribution Company]* having its Head/Registered Office at .... (hereinafter referred to as **"DISCOM"** which expression shall unless repugnant to the context or meaning thereof includes its successors and assigns) of the **THIRD PART**.

The Nodal Agency, the State Government, and the Utility are hereinafter also referred to collectively as the **"Parties"** and individually as the **"Party"**.

WHEREAS the Government of India has launched **Revamped Distribution Sector Scheme** (hereinafter referred to as "**RDSS**") as a Central Sector Scheme to improve the operational efficiencies and financial sustainability, by providing financial assistance to DISCOMs for strengthening of supply infrastructure. The DISCOM can take up projects relating to installation of prepaid smart meters for all consumers along with associated AMI, communicable meters for DTs & Feeders to enable automated Energy Audit and Accounting, SCADA, DMS & RT-DAS, Enterprise Resource planning (ERP) and other ICT initiatives, and Distribution infrastructure works as required for strengthening and modernizing the system as well as measures for loss reduction with the end objective of reducing losses and ensuring 24 x 7 power supply , Public Charging Infrastructure for Electric Vehicles (EVs), Disaster Resilient Infrastructure works (hereinafter referred to as the "**Project**") on the terms & conditions contained in the **Order No. F. No. 20/9/2019-IPDS dated 20.07.2021 issued by Ministry of Power and RDSS guidelines and any amendments thereto issued by the nodal agency.**

NOW IT IS HEREBY AGREED BY AND BETWEEN THE PARTIES HERETO as follows:

1. This Agreement signed between (a) ______ Limited, the Nodal Agency on behalf of Ministry of Power, Government of India;(b) State Government and (c) Discom for implementation of Revamped Distribution Sector Scheme shall be implemented by the Discom in letter and spirit. Government of India will monitor implementation of the precedent conditions agreed to upon in this Agreement before releasing funds through Nodal Agency.

2. This Agreement shall be read in accordance with the provisions of **Order No. F. No. 20/9/2019-IPDS dated 20.07.2021 issued by Ministry of Power and RDSS guidelines and any amendments thereto issued by the nodal agency**. The said RDSS Guidelines shall form an integral part of this agreement as Annexure – 'A' as if fully set forth hereunder and all the terms and conditions set out in the said Revamped Distribution Sector Scheme Guidelines shall be binding on the Parties hereto.

3. The parties have agreed that the individual project(s), as proposed by DISCOM and sanctioned by the Monitoring Committee (MC) /nodal agency, under Revamped Distribution Sector Scheme (RDSS), commencing from the financial year 2021-22 shall be deemed to have been covered under this agreement. The terms and conditions of sanction by the MC/nodal agency for a particular project, as contained in the sanction letter (including the supplementals, modifications if any) issued by the nodal agency, shall also form part and parcel of this agreement.

4. DISCOM has to formulate, plan, design, develop and implement the projects in accordance with the Standard Bidding Documents for various components as circulated by Nodal agencies and in line with the Central Vigilance Commission (CVC) guidelines. Also, guidelines, SBDs, specifications and construction standards shall be adopted wherever applicable.

5. State Government and DISCOM agree that in the event the projects are not implemented satisfactorily in line with the sanction terms and conditions, left incomplete or the assets could not be put to use, or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines then Monitoring Committee is empowered to recall the grant released to the DISCOMs at any stage of the scheme.

6. State Government and DISCOM agree that performance in the Reforms Based Results Linked Revamped Distribution scheme would also form integral part of the financing norms of PFC, REC, Banks/FIs and MDBs for any project in the Distribution Sector even beyond those related to funding under this scheme.

7. State Government and DISCOM agree that if due to adverse performance in the Reforms Based Results Linked Revamped Distribution scheme, funds does not get released then any advance amount released shall be refunded to the Government of India.

8. PROJECT FINANCING

i) For Smart Metering works:

The financial support under the scheme shall be as under:

a) 15% of sanction cost limited up to Rs.900 per meter for Consumer metering would be provided as grant by Government of India (22.5% for special category limited to Rs.1350)

b) The implementation of the metering scheme is proposed through PPP on TOTEX mode. State Government/DISCOM may also provide budgetary support in TOTEX mode.

c) An incentive of 7.5% (11.25% for special category) of the cost per consumer meter worked out for the whole project or Rs. 450 per consumer meter (Rs.675 for special category), whichever is lower, would be provided for prepaid Smart meters installed within the targeted timeline of first phase mission i.e. by December, 2023. The decision of Monitoring Committee shall be final while calculating Additional grant applicable to any project under the Scheme.

d) The consumer meters shall mandatorily be prepaid meters to be eligible for availing grant under the scheme.

e) Discoms shall ensure Feeder/DT metering in accordance with the requirements of the scheme/ directions of MOP

ii) For Distribution Infrastructure works:

a) The sanction of DPR for Modernisation & System Augmentation and release of grant for both loss reduction works (other than the advance) and for the Modernisation & System Augmentation works will be based on the DISCOM meeting the pre-qualifying criteria and achieving the specified marks in the Evaluation Matrix. Also, Monitoring Committee will issue sanctions of loss reduction works contingent to sanctions of metering works being already in place; or, Smart metering works being already implemented by the DISCOMs in line with the SBD for Smart prepaid metering in TOTEX mode; or together, as the case may be.

b) The financial support under the scheme shall be as under:

- ❖ The grant shall be restricted to 60% (90% for special category) of sanction cost or award cost or executed cost (excluding State & local taxes) whichever is lower *(this lowered cost herein after shall be referred to as 'Sanction cost')*. The state & local taxes are not admissible under RDSS and to be borne by the State Government/Discom

- ❖ 40% (10% for special category) of sanction cost shall be either loan from Financial Institutions (REC/PFC or MDBs) or own funds of State Government. REC/PFC shall consider offering loans at competitive interest rates for the RDSS scheme.

iii) Cost overruns beyond sanction cost, if any, and PMA charges beyond allowed GOI grant shall be borne by the State Government/Discom.

iv) To be eligible for grant, State Government/Discom has to follow the SBD circulated by the nodal agency or obtain specific approval of Nodal agency for deviations.

v) State Government to arrange for DISCOM contribution in case DISCOM fails to arrange the same;

vi) State Government to furnish guarantee for the loan component under the scheme in case the DISCOM is not able to provide any other mode of security.

vii) Directives of Ministry of Power in this regard if any, would be followed.

9. Funds

i) The release of the fund shall be as per the clause 5.2 of the operational guidelines of RDSS. The terms & conditions of release of funds for a particular project as contained in operational guidelines issued, shall also form part of the present agreement. The guidelines shall include supplementals and modifications issued, if any. The releases will be subject to the deductions as agreed amongst Nodal Agencies, State Government and Discom, as per RDSS guidelines or statutory requirements.

ii) State Government/ Discom commits to refund grant component released to Utility in case of non-compliance of RDSS guidelines/ this agreement or poor progress resulting to short-closure/ cancellation.

iii) MoP/ Monitoring Committee is empowered to recall the grant released to the DISCOMs at any stage of the scheme, in case the sanctioned works are left incomplete or the assets could not be put to use or funds are utilized for purposes other than those prescribed in the scheme/ as approved by the Monitoring Committee in accordance with the prescribed guidelines. Further, if by the end of year 2025-26, a DISCOM is unable to get any fund released due to non-fulfillment of performance criteria of the scheme,, the initial advance of 10% will have to be refunded by the DISCOM. Any unrecovered/due amounts from earlier schemes of Ministry of Power, GOI shall also be allowed to be adjusted against releases in the current scheme till 2025-26.

iv) In order to secure the loan of NBFCs under MoP, the existing TPA (Tri-partite Agreement) arrangement among Government of India, the State Government and the RBI shall be suitably amended to provide that the loan servicing payments in case of default can be recovered through RBI.

v) DISCOMs shall maintain books of accounts both for receipt of funds from Nodal Agency and release to contractors for each of the project.

vi) DISCOM shall ensure that fund shall not be invested in any other bank/branch, whether for short term or medium term, including fixed deposits.

10. Opening of Bank Account

i) DISCOM (Implementing Agency) shall open an Assignment Account with NDRO, Reserve Bank of India (RBI) as Sub Agency for implementation of the RDSS through PFC (Central Nodal Agency) or as per the latest policy/ guidelines/ directives issued by Ministry of Power from time to time. All project related payments to the contractors/ agencies by DISCOM shall be done directly from the Assignment Account with RBI. Regarding counterpart funding, DISCOM shall open a dedicated scheme account in a nationalized bank having E-banking facility or as per directions issued by MoP/ Nodal Agency. MoP/ Nodal Agency shall have the view right of the said Bank Account.

ii) State Government/Discom shall enter details like receipts, expenditures, etc in Public Fund Management System (PFMS) portal. In case of non-entering desired details in PFMS portal, banks may not consider release of funds to Contractors.

11. Distribution Reforms Committee

i) State Government shall setup a Distribution Reforms Committee (DRC), headed by the Chief Secretary, Secretary in charge of the Energy/Power Department of the State as the convener and consisting of Secretary (Finance), Secretary (Land Revenue) and Secretary (Forest and Environment) as its members. The roles and responsibilities of Distribution Reforms Committee (DRC) are mentioned in clause 7.4 of the operational guidelines of RDSS.

12. DISTRICT ELECTRICITY COMMITTEE (DEC):

i) State Government shall also setup a District Electricity Committee (DEC) as per the Ministry of Power letter no. 42/17/2011-RE [206787] dated 26.09.2021. The Committee shall meet periodically at District headquarters at least once in 3 months to review and coordinate overall development of power supply infrastructure in the district in accordance with the schemes of Government.

ii) State Government shall also facilitate participation of Public Representatives in the inauguration events etc.

13. PROJECT MANAGEMENT

i) Project Management Agency (PMA) shall be appointed by Discom/Power Department to assist them in project management to ensure timely implementation of the project. PMA charges, restricted to 2.5% of the GBS of component I - metering and 1.5% of project cost of component II - Distribution infrastructure works, shall be sanctioned as a separate component of the scheme. PMA charges, over and above the permitted amount shall be borne by the respective DISCOM/ Government.

ii) State Government shall ensure Reforms support in the form of consultancy for Discoms and payments thereof.

iii) State Government/Discom shall ensure establishment of a dedicated project implementation cell at district level and a centralized cell at Head office level.

14. CONSTRUCTION / IMPLEMENTATION

i) State Government/Discom shall make all possible efforts to complete the project(s) within the approved time frame starting from the date of award of project. State Government to provide required land for substations and facilitate in obtaining other statutory clearances (ROW, forest etc.);

ii) State Government/Discom to ensure following Public Procurement (Preference to Make in India) for Purchase Preference (linked with local content) Order in respect of Power Sector dated 28.7.2020 or its latest amendments thereof. DEA directives to be followed in case funds are availed through multi-lateral financial institutions.

iii) State Government/Discom shall suitably incorporate the provisions towards levy of Liquidated Damages in their agreements with contractors for delay in completion of the project(s) and also other relevant contractual provisions pertaining to the procurement of goods and works. Out of the amount recovered towards Liquidated Damages, if any, by State Government/Discom under this provision, the amount proportionate to subsidy shall be remitted to MoP account.

iv) During implementation of projects, State Government/Discom shall be solely responsible & accountable for assuring quality in RDSS works. State Government/Discom shall formulate a comprehensive Quality Assurance (QA) and Inspection Plan with an objective to build Quality Infrastructure under RDSS works. The QA and Inspection Plan shall be an integral Part of the contract agreement with turnkey contractor or equipment supplier/vendor and erection agency as the case may be in case of partial turnkey and departmental execution of works.

v) State Government/Discom shall also ensure that the quality of material/equipment supplied at site and field execution of works under the project is in accordance with Quality Assurance & Inspection Plan.

vi) State Government/Discom to ensure submission of updated monthly physical and financial progress of the project to the Nodal Agency including its updation on the web portal.

vii) State Government/Discom shall ensure submission of geotagged photographs of the assets created under the scheme and same shall be uploaded in the portal while submitting the progress and claims. The detailed methodology shall be provided by the Nodal agency.

viii) State Government/Discom shall ensure that there is no duplication / overlapping of works with any other Government of India and State scheme.

ix) Appropriate third party/parties will be appointed by MOP / Nodal Agencies to assess / verify the achievements of DISCOMs with respect to the action plan finalized on periodical basis using the Result Evaluation Framework.

x) The projects shall be awarded and implemented within the time frame as per guidelines on turn-key basis through e-tendering in accordance with the prescribed Procurement Policy, Standard Bidding Document and Technical Specifications / amendments thereof.

xi) For metering, Standardization Testing and Quality Certification (STQC) & Cyber security aspects have to be mandatorily included in the contract, while following Government of India's stipulations related to source of procurement.

15. UTILISATION CERTIFICATE

i) State Government/Discom shall submit Utilization Certificate (UC) for the funds released during the Financial year and utilization thereof in prescribed format, latest by 30th April of succeeding year. The UC shall provide the physical progress/achievements also apart from financial utilization. Utilization Certificate is also mandatory to be submitted for every disbursement. The prescribed format of UC shall be furnished by the Nodal agency.

16. ARBITRATION

i) Any differences or dispute among the parties arising out of or in connection with this project shall be discussed and settled amicably amongst the parties. In the event of non-settlement of the difference or dispute within sixty (60) days, the same shall be referred to the Secretary to the Government of India in the Ministry of Power, as the sole arbitrator whose decision shall be final and binding on the parties to this Agreement.

17. FORCE MAJEURE

i) The parties shall ensure due compliance with the terms of this Agreement. However, no party shall be liable for any claim for any loss or damage whatsoever arising out of failure to carry out the terms of the Agreement to the extent that such a failure is due to force majeure events such as fire, rebellion, mutiny, civil commotion, riot, strike, lock-out, forces of nature, accident, act of God and any other reason beyond the control of concerned party. But any party claiming the benefit of this clause shall satisfy the other party of the existence of such an event and give written notice of 30 days to the other party to this effect. The services covered under this Agreement shall be started as soon as practicable by the parties concerned after such eventuality has come to an end or ceased to exist.

18. IMPLEMENTATION OF THE AGREEMENT

i) All discretions to be exercised and directions, approvals, consents and notices to be given and actions to be taken under these presents, unless otherwise expressly provided herein, shall be exercised and given by the signatories to this Agreement or by the Authorized representative(s) that each party may nominate in this behalf and notify in writing to the other party by Registered Post. Any other nomination of Authorized representative(s) and/or changes in designation shall be informed likewise in writing to/by State Government/Discom and PFC within one month of signing of the Agreement. Any changes in designations/ registered office address shall be intimated in writing to all concerned parties.

ii) In case of any inconsistency between the Terms and Conditions of this Agreement and the provisions of RDSS Guidelines, the latter shall prevail.

iii) Any dispute arising out of this Agreement/interpretation of any clause may be referred to Secretary (Power), Govt. of India whose decision shall be final and binding on all parties.

19. NOTICE

i) All notices required or referred to under this Agreement, shall be in writing and signed by the respective authorized signatories of the parties mentioned herein above, unless otherwise notified. Each such notice shall be deemed to have been duly given if delivered or served by registered/speed post of Department of Posts to the respective heads on the addresses mentioned in the recital.

20. VALIDITY & TERMINATION

i) This agreement shall remain valid until all liabilities and obligations of the Discom pertaining to the RDSS scheme implementation are discharged to the satisfaction of the Nodal Agency/Ministry of Power.

ii) This agreement shall remain valid unless terminated with consent of all the Parties.

21. JURISDICTION

The competent Courts of Delhi shall have exclusive jurisdiction in all matters relating to or arising out under these presents.

IN WITNESS WHEREOF the parties have executed these presents through their Authorized Representatives at ________________________.

SIGNED AND DELIVERED BY (on behalf of **STATE GOVT. OF ....**) **Signature ....** **Name & Designation ....** **Address ....** **..**	in the presence of .... Signature .... Name & Designation .... Address ....
SIGNED AND DELIVERED BY (on behalf of **UTILITY..............................**) **Signature ....** **Name & Designation ....** **Address**	in the presence of .... Signature .... Name & Designation .... Address ....
SIGNED AND DELIVERED BY **Power Finance Corporation Ltd** (on behalf of **Ministry of Power, Govt. of India**) **Signature ....** **Name & Designation ....** **Address**	in the presence of .... Signature .... Name & Designation .... Address ....

Annexure-F

Acceptance Letter

(From Government of ....)

No. Dated:

....

The Chairman & Managing Director,
Power Finance Corporation Limited,
Urjanidhi, 1 Barakhamba Lane
Connaught Place,
New Delhi-110001

Sub: Acceptance of financial assistance to <DISCOM> for implementation of Projects under RDSS Scheme (Grant Nos. _________and PMA Grant No- _____) and terms and conditions for implementation of projects under RDSS

This is with reference to your sanction letter No... dated: .... conveying approval of Action Plan and DPRs for sanction of project cost of Rs...................Cr. for implementation of prepaid Smart metering works & Rs......... for implementation of Infrastructure works under Loss reduction in............... <DISCOM> under RDSS scheme.

The Government accepts the Action Plan and above sanctions on the terms and conditions as set out in the sanction letter under reference above and RDSS guidelines..

District wise and Project area wise bifurcation of work and project cost approved for Infrastructure – Loss reduction works etc. shall be submitted by <Discom> within 15 days of this letter as per the requirement of MOP/ Nodal Agency.

Yours faithfully,

(Authorized Officer)
State Government

Smart meter Installation phasing wise details

			No. of meters								Total cost meter month wise							
	Meter Type		**1-ph**	**3-ph**	**LT-CTO**	**Consumer**	**DT Meter**	**Feeder**	**ABT**	**Total**	**1-ph**	**3-ph**	**LT-CTO**	**HT- Consumer**	**DT Meter**	**Feeder**	**ABT**	**Total**
	Rate per meter	No. of meter	**901212**	**168419**	**6053**	**206**	**3398**	**1255**	**133**	**1080676**								
	Rate per meter per month																	
	Dec-23		**15328**	**0**	**0**	**0**	**0**	**0**	**0**	**15328**	1875437.00	0.00	0.00	0.00	0.00	0.00	**0.00**	1875437.00
	Jan-24		**18304**	**0**	**0**	**0**	**0**	**198**	**0**	**18502**	4114998.52	0.00	0.00	0.00	0.00	89098.88	**0.00**	4204097.40
	Feb-24		**52184**	**389**	**0**	**0**	**50**	**24**	**0**	**52647**	10499902.26	71063.00	0.00	0.00	11249.79	99898.74	**0.00**	10682113.79
	Mar-24		**50419**	**2350**	**0**	**0**	**331**	**490**	**0**	**53590**	16668851.78	500363.87	0.00	0.00	85723.43	320395.97	**0.00**	17575335.05
	Apr-24		53218	7815	30	1	407	63	6	**61540**	23180269.21	1928017.62	6749.88	449.99	177296.76	348745.61	**6942.77**	25648471.84
	May-24		37869	9104	19	8	471	35	52	**47558**	27813680.21	3591147.47	11024.80	4049.95	283269.82	364495.41	**67113.40**	32134781.07
	Jun-24		4645	4975	73	36	352	18	29	**10128**	28382013.00	4499986.55	27449.50	20249.75	362468.38	372595.31	**100670.11**	33765432.58
	Jul-24		0	0	68	44	311	7	0	**430**	28382013.00	4499986.55	42749.22	40049.50	432442.10	375745.27	**100670.11**	33873655.73
	Aug-24		2714	528	104	39	350	0	0	**3735**	28714080.85	4596442.23	66148.79	57599.27	511190.66	375745.27	**100670.11**	34421877.18
	Sep-24		2716	1054	105	36	109	0	0	**4020**	29046393.41	4788988.24	89773.36	73799.07	535715.21	375745.27	**100670.11**	35011084.66
	Oct-24		0	750	400	20	324	0	0	**1494**	29046393.41	4925999.16	179771.72	82798.96	608613.88	375745.27	**100670.11**	35319992.49
	Nov-24		0	800	400	20	350	0	10	**1580**	29046393.41	5072144.14	269770.07	91798.84	687362.44	375745.27	**112241.38**	35655455.55
	Dec-24		0	2000	600	2	334	0	10	**2946**	29046393.41	5437506.58	404767.60	92698.83	762511.07	375745.27	**123812.66**	36243435.42
	Jan-25		44254	9100	1500	0	9	0	10	**54873**	34461032.57	7099905.70	742261.44	92698.83	764536.03	375745.27	**135383.94**	43671563.78
	Feb-25		44254	11750	1300	0	0	50	10	**57364**	39875671.74	9246410.06	1034756.09	92698.83	764536.03	398244.99	**146955.21**	51559272.95
FY 2024-25	Mar-25		44254	11837	1454	0	0	50	6	**57601**	45290310.90	11408807.69	1361900.12	92698.83	764536.03	420744.70	**153897.98**	59492896.25
	Apr-25		44254	25000	0	0	0	50	0	**69304**	50704950.06	15975838.25	1361900.12	92698.83	764536.03	443244.42	**153897.98**	69497065.69
	May-25		44254	27967	0	0	0	50	0	**72271**	56119589.23	21084883.99	1361900.12	92698.83	764536.03	465744.14	**153897.98**	80043250.31
	Jun-25		44254	26500	0	0	0	50	0	**70804**	61534228.39	25925936.38	1361900.12	92698.83	764536.03	488243.85	**153897.98**	90321441.58
	Jul-25		44254	26500	0	0	0	50	0	**70804**	66948867.56	30766988.77	1361900.12	92698.83	764536.03	510743.57	**153897.98**	100599632.85
	Aug-25		44254	0	0	0	0	50	0	**44304**	72363506.72	30766988.77	1361900.12	92698.83	764536.03	533243.29	**153897.98**	106036771.73
	Sep-25		44254	0	0	0	0	50	0	**44304**	77778145.89	30766988.77	1361900.12	92698.83	764536.03	555743.00	**153897.98**	111473910.61
	Oct-25		44254	0	0	0	0	20	0	**44274**	83192785.05	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	116897549.66
	Nov-25		44254	0	0	0	0	0	0	**44254**	88607424.22	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	122312188.83
	Dec-25		44254	0	0	0	0	0	0	**44254**	94022063.38	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	127726827.99
	Jan-26		44254	0	0	0	0	0	0	**44254**	99436702.55	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	133141467.16
	Feb-26		44254	0	0	0	0	0	0	**44254**	104851341.71	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	138556106.32
FY 2025-26	Mar-26		44259	0	0	0	0	0	0	**44259**	110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Apr-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	May-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jun-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jul-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Aug-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Sep-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Oct-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Nov-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Dec-26										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jan-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Feb-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
FY 2026-27	Mar-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Apr-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	May-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jun-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jul-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Aug-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Sep-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Oct-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Nov-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Dec-27										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jan-28										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Feb-28										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
FY 2027-28	Mar-28										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Apr-28										110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26

	Meter Type		1-ph	3-ph	LT-CTO	Consumer	DT Meter	Feeder	ABT	Total		1-ph	3-ph	LT-CTO	HT- Consumer	DT Meter	Feeder	ABT	Total
	May-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jun-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jul-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Aug-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Sep-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Oct-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Nov-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Dec-28											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jan-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Feb-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
FY 2028-29	Mar-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Apr-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	May-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jun-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jul-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Aug-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Sep-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Oct-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Nov-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Dec-29											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jan-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Feb-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
FY 2029-30	Mar-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Apr-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	May-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jun-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jul-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Aug-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Sep-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Oct-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Nov-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Dec-30											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jan-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Feb-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
FY 2030-31	Mar-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Apr-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	May-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jun-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jul-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Aug-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Sep-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Oct-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Nov-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Dec-31											110266592.64	30766988.77	1361900.12	92698.83	764536.03	564742.89	**153897.98**	143971357.26
	Jan-32											110266592.64	30766988.77	1361900.12	92698.83	129372.64	429744.59	**135383.94**	143182681.52
	Feb-32											110266592.64	30766988.77	1361900.12	0.00	0.00	0.00	**0.00**	142395481.52
FY 3031-32	Mar-32											110266592.64	30766988.77	1361900.12	0.00	0.00	0.00	**0.00**	142395481.52
	Apr-32											110266592.64	30766988.77	1361900.12	0.00	0.00	0.00	**0.00**	142395481.52
	May-32											110266592.64	30766988.77	1361900.12	0.00	0.00	0.00	**0.00**	142395481.52
	Jun-32											110266592.64	30766988.77	1210477.88					142244059.29
	Jul-32											110266592.64	30766988.77						141033581.41
FY 3032-33	Aug-32											172462264.96	23181516.38						195643781.33
											Total	**9923993337.96**	**2769028988.89**	**122571010.39**	**8342894.94**	**68808242.74**	**50826859.95**	**13850818.17**	**12957422153.04**

Rate/meter

1-ph	**11011.83**	**122.3536667**	**9923993338**
3-ph	**16441.31**	**182.6812222**	**2769028989**
LT-CTO	**20249.63**	**224.9958889**	**122571010.4**
HT- Consumer	**40499.49**	**449.9943333**	**8342894.94**
DT Meter	**20249.63**	**224.9958889**	**68808242.74**
Feeder	**40499.49**	**449.9943333**	**50826859.95**
ABT	**104141.49**	**1157.127667**	**13850818.17**
Total cost of meter			**12957422153**

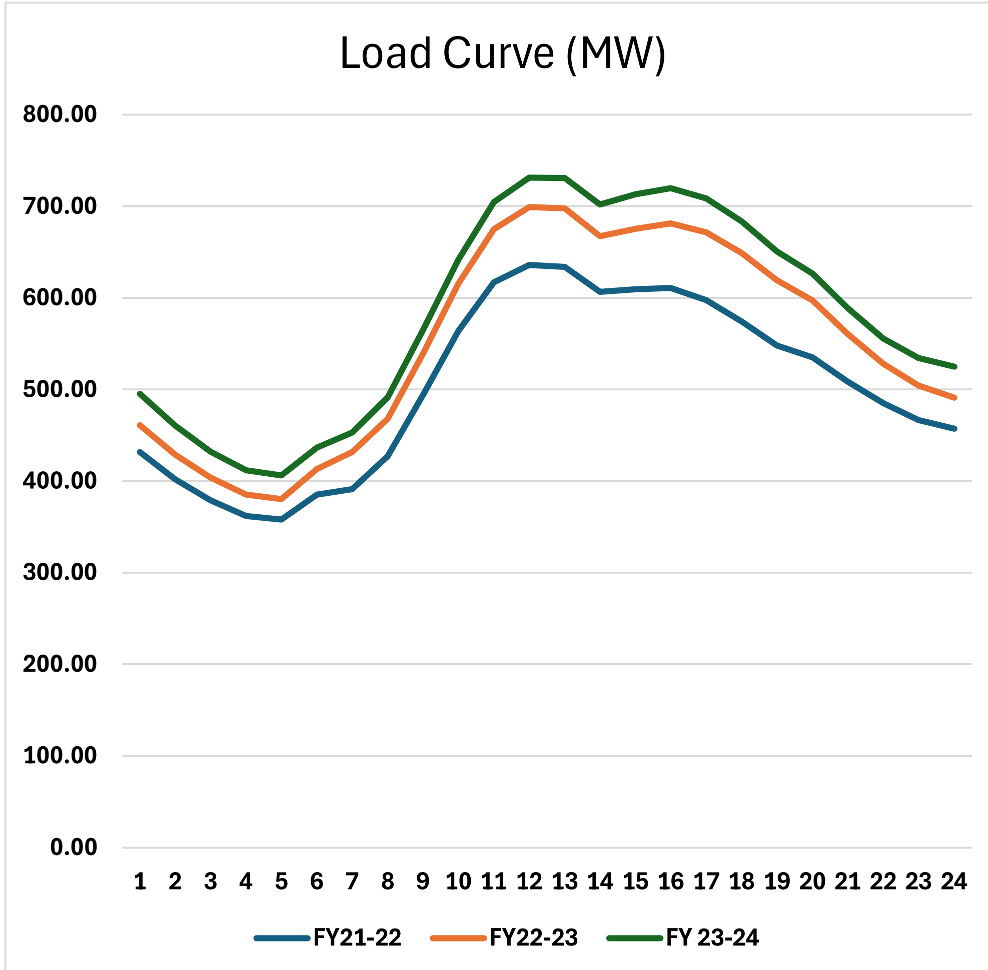
	FY 2023-24	FY 2024-25	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30
feeder meter cost	509393.5853	4535042.891	6385419.59	6776914.66	6776914.66	6776914.66	6776914.66
Rs. In Cr.	0.05	0.45	0.64	0.68	0.68	0.68	0.68
DT meter	0.009697323	0.665447841	0.917443237	0.917443237	0.917443237	0.917443237	0.917443237

FY wise payment	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**	**FY 2026-27**	**FY 2027-28**	**FY 2028-29**	**FY 2029-30**	**FY 2030-31**	**FY 2031-32**	**FY 2032-33**
Amount	34336983.23	456797919.5	1340577570	1727656287	1727656287	1727656287	1727656287	1727656287	1723715860	763712385.1
Amount (Rs. Cr.)		**49.11**	**134.06**	**172.77**	**172.77**	**172.77**	**172.77**	**172.77**	**172.37**	**76.37**

AMISP Monthly Progress - September-2024																									
Progress of Smart Metering Works under RDSS,																			AMISP : M/s ATL						
Award Value : 1303.16 Cr.																	Date of Agreement : 10.03.2023								
	Target											Achieved														
Description	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Total target up to Sept-24	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Total achieved up to Sept-24	Achievment in %	Shortfall (Upto July-24)	Target Oct-24	Comulative target for the Month Aug-24
Single Phase Whole Current Consumer Meter	37500	27095	99515	83400	92017	102056	119400	118181	99048	59000	837212	15328	18304	52184	50419	53218	37869	4645	0	2714	2716	237397	28%	599815	32000	631815
Three Phase Whole Current Consumer Meter	2500	20000	20634	17063	28169	24511	20400	16480	1164	10000	160921	0		389	2350	7815	9104	4975	0	528	1054	26215	16%	134706	7498	142204
Three Phase LT CT Consumer Meter	0	870	784	695	738	764	520	530	457	360	5718	0		0	0	30	19	73	68	104	105	399	7%	5319	175	5494
Three Phase HT meter	0	50	50	50	56						206	0		0	0	1	8	36	44	39	36	164	80%	42		42
Three Phase LT CT - DT Meter	398	1500	1500								3398	0		50	331	407	471	352	311	350	109	2381	70%	1017		1017
Three Phase HT Feeder Meter	1255										1255	0	198	24	490	63	35	18	7	0	0	835	67%	420		420
Three Phase CT/PT Operated ABT Meter	133										133	0		0	0	6	52	29	0	0	0	87	65%	46		46
	41786	**49515**	**122483**	**101208**	**120980**	**127331**	**140320**	**135191**	**100669**	**69360**	**1008843**	**15328**	**18502**	**52647**	**53590**	**61540**	**47558**	**10128**	**430**	**3735**	**4020**	**267478**		**741365**	**39673**	**781038**

Status of Insatallation up to APR-24	
Conumer Meter	26%
DT Meter	70%
Feeder Meter	67%
Govt. Department Meter	29%

	FY21-22	FY22-23	FY 23-24
1	431.43	460.93	495.22
2	401.90	428.73	460.70
3	379.02	403.81	431.81
4	361.85	385.23	411.86
5	358.00	380.55	406.31
6	385.17	413.01	436.54
7	391.27	431.60	453.05
8	427.14	467.87	491.23
9	493.62	538.81	564.53
10	564.06	615.41	641.84
11	616.88	674.90	704.51
12	635.85	699.27	731.37
13	633.79	697.50	730.69
14	606.37	667.10	701.93
15	609.38	675.29	712.93
16	610.53	681.38	719.72
17	597.39	671.58	708.43
18	574.08	648.68	683.43
19	547.81	618.95	650.34
20	535.08	597.18	626.40
21	508.46	560.54	588.64
22	485.06	528.07	555.69
23	466.56	504.28	534.16
24	457.23	490.92	524.92



	FY 25-26	FY 26-27	FY 27-28	FY 28-29	FY 29-30
1	503.8	508.1	512.5	516.9	521.3
2	468.7	472.7	476.7	480.8	485.0
3	439.3	443.1	446.9	450.7	454.6
4	419.0	422.6	426.2	429.9	433.6
5	413.3	416.9	420.5	424.1	427.7
6	444.1	447.9	451.8	455.6	459.6
7	460.9	464.8	468.8	472.9	476.9
8	499.7	504.0	508.4	512.7	517.1
9	574.3	579.2	584.2	589.2	594.3
10	652.9	658.5	664.2	669.9	675.7
11	716.7	722.8	729.1	735.3	741.7
12	744.0	750.4	756.9	763.4	769.9
13	743.3	749.7	756.2	762.7	769.2
14	714.1	720.2	726.4	732.6	738.9
15	725.2	731.5	737.8	744.1	750.5
16	732.2	738.5	744.8	751.2	757.7
17	720.7	726.9	733.1	739.4	745.8
18	695.2	701.2	707.2	713.3	719.5
19	661.6	667.3	673.0	678.8	684.6
20	637.2	642.7	648.2	653.8	659.4
21	598.8	604.0	609.2	614.4	619.7
22	565.3	570.1	575.1	580.0	585.0
23	543.4	548.1	552.8	557.5	562.3
24	534.0	538.6	543.2	547.9	552.6