

Before the
MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
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Case No. 173 of 2024

Petition of Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) for seeking adoption of tariff for procurement of storage capacity from 250 MW/ 500 MWh with additional Green Shoe capacity upto 500 MW/1000 MWh standalone Battery Energy Storage System under competitive bidding process to be installed in MSEDCL sub-stations through competitive bidding under Section 63 of the Electricity Act, 2003 for meeting Renewable Purchase Obligations.

IA. No. 85 of 2024 in Case No. 173 of 2024

Interlocutory Application of MSEDCL for seeking urgent hearing in Case No. 173 of 2024.

M/s. Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL)...	Petitioner
M/s. Pace Digitek Private Limited (PDPL)...	Respondent

Coram
Sanjay Kumar, Chairperson
Anand M. Limaye, Member
Surendra J. Biyani, Member

For the Petitioner:	Ms. Deepa Chawan (Adv)
For the Respondent:	None

ORDER

Date: 20 March 2025

1. Maharashtra State Electricity Distribution Co. Ltd. (MSEDCL) filed the present Petition on 24 October 2024. MSEDCL in present Petition seeking adoption of tariff for procurement of storage capacity from 250 MW/ 500 MWh with additional Green Shoe capacity up to 500 MW/1000 MWh standalone Battery Energy Storage System (BESS) under competitive bidding process to be installed in MSEDCL sub-stations through competitive bidding. MSEDCL referred to Section 63 of the Electricity Act, 2003 and Regulation 18 & 19 of MERC (Renewable Purchase Obligation, its Compliance and Implementation of Renewable Energy Certificate Framework) Regulations, 2019 and its successive Amendments.

2. **MSEDCL's main prayers are as under:**

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- a) *To admit the Petition as per the provisions as per the provisions of the Regulation 19 of MERC (RPO, Its Compliance and Implementation of REC Framework) Regulations, 2019 and under Section 63 of the Electricity Act (EA), 2003.*
- b) *To accord approval for adoption of tariff for Rs. 2,19,001/- Rs Per MW Per Month in the e-reverse auction conducted by MSEDCL for 250 MW/500 MWh Base Capacity and 500 MW/ 1000 MWh additional Green Shoe Capacity.*
- c) *To accord approval for signing of the Battery Energy Storage Purchase Agreement (BESPA) (enclosed as Annexure-C) with the successful bidders at the competitively discovered Tariff along with green shoe capacity.*
- d) *To consider procurement of BESS for meeting RPO requirement of MSEDCL. „*

3. On 19 December 2024, MSEDCL filed IA No.85 of 2024 in Case No.173 of 2024 for urgent listing of matter.

4. The IA along with main matter was listed for hearing on 14 January 2025. The Advocate of MSEDCL narrated the scheme of arrangement and process adopted by MSEDCL in conducting the bidding process. She requested the Commission to consider the Petition on merits. Considering averments made during the hearing, the Commission directed to file written submission on estimated power purchase cost saving after roll-out of the project and timeline for completion of project.

5. **MSEDCL in its Petition has stated as follows:**

- 5.1. MSEDCL's primary objective of procuring Battery Energy Storage Systems (BESS) is to meet the requirements during the peak and off-peak hours.

- 5.2. MSEDCL had floated RfS for setting up of pilot projects of 250 MW/ 500 MWh Standalone BSES in Maharashtra under Tariff-Based Global Competitive Bidding with additional Green Shoe capacity up to 500 MW/ 1000 MWh. These projects are envisaged to be set up on the 25 distinct locations with individual project capacity of 10 MW/ 20 MWh.
- 5.3. As per Resource Adequacy, in FY 2029-30 total storage requirements is 4600 MW. To fulfil this requirement MSEDCL has already tied-up 4074 MW pump storage capacity. The balance capacity is planned to be fulfilled through present procurement.
- 5.4. In first phase of MSKVY 2.0 tendering process, LOA of 9169 MW is awarded by MSEDCL and work of installation of solar projects is going on in full swing and these projects are going to get commissioned in phases up to September 2025.
- 5.5. Further, the projects under MSKVY 2.0 being the decentralized projects will get connected at MSEDCL sub-stations and day time power supply will be provided to the AG consumers. As the load of the AG consumer varies seasonally the excess generation of these decentralized solar plants may be used for charging the battery storage plants envisaged under the Rfs.
- 5.6. Thus, sub-stations under consideration will have availability of solar energy supplied from decentralized solar projects developed under MSKVY 2.0 at very reasonable weighted average rate of Rs. 3.08/-. BSES system will get charged with excess generation and during the peak load hours when the rates in the exchange are high, it will get discharged.
- 5.7. MSEDCL has floated a tender on 16 August 2024 for procurement of storage capacity from 250 MW/ 500 MWh with additional Green Shoe capacity up to 500 MW/1000 MWh Standalone Battery Energy Storage System under competitive bidding process on Bharat-ETS web portal in line with the Commission's directions to meet its RPO requirement and to meet changing demand pattern and also for cost optimization purpose.
- 5.8. The tender documents are in line with Ministry of Power (MoP) guidelines dated 10 March 2022 for Procurement and utilization of BESS as part of Generation, Transmission and Distribution assets, along with Ancillary Services.
- 5.9. The Salient features of the RfS are as under:-
- Tender Capacity: 250 MW/ 500 MWh with Green Shoe up to 500 MW/1000 MWh
 - Minimum Project Storage Capacity: The minimum bid size is 20 MW/ 40 MWh.
 - Scope Of Works: Install, operate and maintain a BESS, with the objective of making the energy storage facility available to MSEDCL for charging / discharging of the BESS, on an 'on demand' basis.

- d. Project location: In the vicinity of Substations of the MSEDCL network in the State of Maharashtra. Land identification and allocation for the Projects will be under scope of the MSEDCL.

(25) No. of locations/substations were finalized for installation of BESS.

- e. Connectivity with the Grid: BESS shall be connected at 33 kV at MSEDCL substation in case BESS is located at MSEDCL sub-station and at 11 kV in case BESS is located at Solar Plant location.
- f. Viability Gap Funding (VGF): VGF of upto 30 % of capital cost for BESS or Rs. 27 lakh per MWh will be provided by Ministry of Power.
- g. Commissioning: 18 months from the effective date of BESP
- h. Availability: Minimum system availability of 85% on annual basis.

5.10. The Pre-bid meeting was conducted on 28 August 2024. The replies to pre-bid queries were uploaded on 14 September 2024.

5.11. The last date for submission of bid was 16 September 2024, which was extended till 23 September 2024 and further extended till 30 September 2024. The Technical bids were opened on 01 October 2024 on request of prospective bidders.

5.12. Total 14 bidders submitted bids.

5.13. All the bidders are technically found qualified and the financial bids were opened on 03 October 2024 and the details are as under:

Sr No	Bidder	Tariff (Rs Per MW/ Per Month)	Locations (Nos)
1	M/s. Avaada Energy Private Limited	436000	25
2	M/s. Bhilwara Energy Limited	399999	5
3	M/s. H G Infra Engineering Limited	394011	25
4	M/s. Hira Steels Limited	371000	11
5	M/s. IndiGrid 2 Limited	422050	25
6	M/s. Mahati Industries Limited	343000	10
7	M/s. Pace Digitek Private Limited	306001	25
8	M/s. Pravaig Energy Private Limited	380000	5
9	M/s. Ramalingam Construction Co. Ltd	740000	10
10	M/s. Ravindra Energy Ltd	540000	10
11	M/s. Reliance Industries Ltd	483000	25
12	M/s. Reliance Power Ltd	321000	25
13	M/s. Solarcraft Power Ltd	493000	10
14	M/s. Torrent Ltd	484000	10

- 5.14. Initially, for one location Bhalwani, e-RA was conducted. Out of 14 bidders, 12 bidders have submitted bid for this location. Only Ravindra Energy and Pravaig had not submitted bid for this location. The rate during the e-RA was discovered as Rs. 2,39,001/-.
- 5.15. Subsequently, bidders were informed to note that single e-reverse auction shall be conducted for all the 25 locations. For this e-reverse auction the starting price shall be Rs.2,39,001/- per MW per Month (which is the offer of Current L1 bidder). The bidder offering the lowest price at the end of such e-reverse auction shall be awarded the respective substations for which the bid was submitted by such bidder.
- 5.16. All the bidders were required to participate in the single e-reverse auction process and no separate e-reverse auction shall be conducted for each substation as envisaged earlier. Any bidder failing to participate in single e-reverse auction shall be deemed to have forgone its right to participate in process and no further claims shall be entertained from such bidder.
- 5.17. The bidders were informed that decision of MSEDCL with respect to award of substations to lowest bidder as per the process mentioned above shall be final and shall be binding on all the bidders. Thereafter, e-RA was conducted for all locations and the result are as under:

Sr. No.	Bidder's Name	Quoted Value (Rs/MW/Month)	Remark
1	M/s. Pace Digitek Private Limited	219001	L1
2	M/s. Hira Steels Limited	220001	L2
3	M/s. Mahati Industries Private Limited	224001	L3
4	M/s. Pravaig Energy Private Limited	230001	L4
5	M/s. Reliance Power Limited	321000	L5
6	M/s. H.G. Infra Engineering Limited	394011	L6
7	M/s. Bhilwara Energy Limited	399999	L7
8	M/s. Indigrid 2 Limited	422050	L8
9	M/s. Avaada Energy Private Limited	436000	L9
10	M/s. Reliance Industries Limited	483000	L10
11	M/s. Torrent Power Limited	484000	L11
12	M/s. Solarcraft Power India 12 Private Limited	493000	L12
13	M/s. Ravindra Energy Limited	540000	L13
14	M/s. Ramalingam Construction Company Pvt Ltd	740000	L14

5.18. The lowest discovered rate was offered by M/s. Pace Digitek Private Limited at Rs. 2,19,001/- Rs Per MW Per Month.

5.19. Justification For Discovered Tariff:

The recent discovered tariff for BESS tenders in e-auction conducted by other utilities / RDA is as below:

Entity	Bid details	Winning developers/ Capacity won	Final tariff in Rs./MW/Month	Tariff discovered in the month
SECI	SECI, 1000 MW/2000 MWh, Storage BESS-II, Delhi, Jun-2024	JSW Neo Energy, 500 MW/1000 MWh	3,81,000	Sep-24
		Reliance Power, 500 MW/1000 MWh	3,81,999	Sep-24
GUVNL	GUVNL, 250+250 MW/500 MWh, Storage Phase-III, Gujarat, Mar-2024	Gensol Engineering Limited, 500 MW	3,72,978	Jun-24
GUVNL	GUVNL, 250 MW/500 MWh, Storage Phase-II, Gujarat, Nov-2023	Gensol Engineering Limited, 70 MW	4,48,996	Mar-24
		IndiGrid 2 Limited, 180 MW	4,49,996	

The tariff discovered in MSEDCL's tender is in line with current market rates.

5.20. For Rs. 2,19,001/- per MW per month, cost of storage is Rs. 3.65/- per unit. Detail working is as under:

One Month Units	1500 MWh x 30 days = 45,000,000 kWh
Input units considering RtE as 85 %	52,941,176 kWh
Cost per month	Rs. 2,19,001/- x 750 MW = Rs. 16,42,50,750/-
Cost of storage to MSEDCL	Rs. 16,42,50,750 / 45,000,000 kWh = Rs. 3.65/- per unit.
Cost of solar energy (Input Energy)	Rs. 3.08/- per unit
Total Cost of Input Energy	52,941,176 kWh x Rs. 3.08/- per unit = Rs. 16,30,58,824/-
Total Cost to MSEDCL	(Rs. 16,42,50,750 + Rs. 16,30,58,824)= Rs. 32,73,09,574/-
Effective Cost to MSEDCL including Input Energy	Rs. 32,73,09,574 / 45,000,000 kWh
	Rs. 7.27/- per Unit

- 5.21. Considering the exchange rate of FY 2023-24 for evening peak 1900 Hrs to 2100 Hrs and CTU plus STU transmission losses plus Distribution losses plus 3 Paise Market cost, the final landed cost is Rs. 8.34 per Unit. Hence, the rate discovered for this tender is reasonable.

The Cost of power Considering the exchange rate of FY 23-24 for evening peak 1900 Hrs to 2100 Hrs	Rs./kWh	7.30
CTU Losses (@3.5%) + STU Losses (@3.18%)+ Distribution Losses (@6.0 %)	Rs./kWh	1.01
Market Cost	Approx. 3 paise per kWh	0.03
Total Landed Cost	Rs./kWh	8.34

- 5.22. As per the tender stipulations, the proposed BESS project by bidders will get commissioned in FY 2026-27. Hence, the energy generated from these projects will be utilized for mitigating the Total RPO target.
- 5.23. Renewable Energy (RE) installation like solar and wind generate power as per the availability of natural resources which are inconsistent in nature and therefore may not match the demand pattern. Further, availability of power from renewable energy sources is unpredictable due to atmospheric conditions and seasonal variations. Owing to this, MSEDCL cannot rely upon the renewable contracted capacity to meet the demand in peak hours/night hours.
- 5.24. Since availability of power from renewable energy sources is unpredictable as stated above, sufficient resources with firm power/ energy storage system needs to be contracted by MSEDCL to cater the demand as projected by the CEA during peak hours (non-solar) and night hours.
- 5.25. MERC RPO & REC framework Regulations, 2019 and 1st Amendment dated: 24 February 2024:
- The Commission notified the MERC RPO & REC framework Regulations, 2019 on 27 December 2019 for the control period from FY 2020-21 to FY 2024-25.
 - Subsequently, vide notification dated 23 February 2024, it has been amended.
 - As per Regulation 7.5(A) of the Amendment RPO Regulations 2019 dated 23 February 2024 , the RPO targets are as below:

Year	Wind RPO	HPO	Distributed RPO	Other RPO	Total RPO	Storage (on Energy basis)
2024-25	0.67%	0.38%	1.50%	27.35%	29.91%	1.50%
2025-26	1.45%	1.22%	2.10%	28.24%	33.01%	2.00%
2026-27	1.97%	1.34%	2.70%	29.94%	35.95%	2.50%
2027-28	2.45%	1.42%	3.30%	31.64%	38.81%	3.00%
2028-29	2.95%	1.42%	3.90%	33.10%	41.36%	3.50%
2029-30	3.48%	1.33%	4.50%	34.02%	43.33%	4.00%

- d. The Energy Storage Obligation to the extent of energy stored from RE sources shall be considered as a part of fulfilment of the Total RPO.
- e. As per Regulation 7.6, procurement of RE power by a Distribution Licensee at a rate discovered through transparent process of competitive bidding may be considered by the Commission for fulfilment of RPO of Distribution Licensee.

6. **MSEDCL in its Additional Submission dated 24 January 2025 stated following:**

6.1. The details of BESS proposed vide this tender is as below

- Capacity – 750 MW / 1500 MWh
- Cycle Per day – One Cycle Two Hours
- Contract period – 12 years
- Project Completion period – 18 months from BESPA.

6.2. Estimated saving per unit through this project towards Power Purchase Cost is summarized hereunder:

a. Saving per unit

Sr. No.	Details	Cost in Rs./Unit
1.	Total Landed Cost Considering the exchange rate of FY 2023-24 for evening peak 1900 Hrs to 2100 Hrs and CTU plus STU transmission losses plus Distribution losses & Market cost	8.34
2.	Effective Cost to MSEDCL including Input Energy from BESS Projects	7.27
3.	Net Saving in Rs. per unit after roll out of BESS Projects	1.07

b. Total saving for Project

Sr. No.	Battery Capacity	No. of Hours per day	Total MWh Per day	Total MU Per year	Saving per unit	Saving Per Year	Contract Period	Total Saving for Contract Period
	MW	Hr	MWh	Mu	Rs.	Rs. Cr.	Years	Rs. Cr.
1	750	2	1500	548	1.07	58.58	12	702.99

6.3. The BESS power Capacity has been considered by MSEDCL in its MYT Petition.

Commission's Analysis and Rulings:

7. The Commission notes that in present Petition MSEDCL is seeking adoption of tariff for procurement of 250 MW/500 MWh with additional Green Shoe Capacity up to 500 MW/1000 MWh standalone BESS under competitive bidding process to be installed in MSEDCL Sub-Stations.

8. Important timeline in bidding process are as below:

Date	Event
16.08.2024	MSEDCL floated tender for procurement of storage capacity from 250 MW/500 MWh with additional Green Shoe capacity up to 500 MW/1000 MWh standalone BESS.
28.08.2024	Pre-Bid Meeting
30.09.2024	Last date for bid submission
01.10.2024	Technical Bid Opening
03.10.2024	Financial Bid Opening

9. Considering the above background and submissions on record, the Commission frames following issues for its consideration:

- Whether fair Competitive bidding process has been conducted by MSEDCL?
- Quantum of Energy Storage capacity procurement to be allowed;
- Whether tariff discover through competitive bidding is in accordance with market condition?

The Commission's ruling on the above issues is provided in the subsequent paragraphs.

10. **Issue A: Whether fair Competitive bidding process has been conducted by MSEDCL?**

10.1 MSEDCL submitted that it has prepared the tender documents based on Guidelines for procurement and utilization of battery Energy Storage Systems as part of Generation, Transmission and Distribution assets, along with Ancillary Services dated 10 March 2022. MSEDCL has adopted single stage, two-envelop competitive bidding procedure

and conducted bidding on ETS portal.

10.2 From document on record it is evident that total (14) bidders have submitted their bids. All the bidders were technically qualified and subsequently financial bids were opened. MSEDCL conducted e-RA for one location- Bhalwani, in which (12) bidders submitted their bids. The discovered rate was Rs.2,39,001/-. After this single e-RA has been conducted for (25) locations with starting tariff at Rs.2,39,001/- The bidders offering lower tariff has been awarded the respective substations for which the bid was submitted.

10.3 MSEDCL has conducted transparent process of bidding which is in accordance with the guidelines notified by the Government of India. Accordingly, the Commission concludes that fair competitive bidding process has been followed under Section 63 of the Electricity Act 2003.

11. Issue B: Quantum of Energy Storage capacity procurement to be allowed

11.1 From RfS document, it is evident that power rating of the project capacity of 500 MWh [250 MWx2 hrs] BESS will be 250 MW i.e. the maximum value of the active Output and Input power at the delivery point. It is mandatory to BESS to offer facility to MSEDCL to charge and discharge the BESS on an 'On Demand' basis. The BESS developer shall guarantee a minimum system availability of 85% on annual basis.

11.2 The Commission notes that MSEDCL has filed the present Petitions with three fold objectives i.e. to integrate excess solar generation from MSKVY 2.0 projects at distribution, reduce peak power procurement and to comply with Energy Storage Obligation targets.

11.3 MSEDCL highlighted that for supply of day time power, it has roll-out MSKVY 2.0 scheme. Seasons affect the Load of AG consumers. In such scenario, there will be excess solar generation, which need to be accommodated at Distribution level. In proposed BESS capacity procurement, MSEDCL is providing land in the vicinity of MSEDCL Substations to BESS developers. MSEDCL has planned to utilize the excess generation for charging BESS and will get the power back as and when required.

11.4 The Commission notes that BESS is crucial for large scale integration of RE. Further, as per MSEDCL's Resource Adequacy Study (ST-DRAP and MT-DRAP), cumulative Capacity Mix with current capacity addition plan for PSP-BESS storage is as below:

Year	PSP – BESS Storage
2025-26	250
2026-27	1000
2027-28	1000
2028-29	2750
2029-30	4824

- 11.5 It is pertinent to note that MSEDCL has already contracted PSP capacity of 3000 MW. The Commission vide its Order dated 26 September 2024 in Case No.156 of 2024 has adopted the tariff for the same. In view of Resource Adequacy Study, it can integrate 1824 MW additional storage capacity. The Commission notes that planned procurement of 750 MW (Base Capacity + Green Shoe) is well within capacity worked out in Resource Adequacy Study.
- 11.6 Further, as per MSEDCL's submission, it will realise net saving of Rs.1.07 per unit on account of reduced power purchase from exchanges which will results in saving of Rs.702.99 Crores in power purchase over the contract period of 12 years.
- 11.7 Apart from above, the Commission notes that RPO (Amendment) Regulations, 2024 stipulates Energy Storage Obligation trajectory till FY 2029-30. The notified trajectory is as below:

Year	Storage (on Energy basis)
2024-25	1.5%
2025-26	2.0%
2026-27	2.5%
2027-28	3.0%
2028-29	3.5%
2029-30	4.0%

As per RPO (Amendment) Regulations, 2024, the Energy Storage Obligation shall be calculated in energy terms as a percentage of total consumption of electricity and shall be treated as fulfilled only when at least 85% of the total energy stored in the Energy Storage System (ESS), on an annual basis, is procured from renewable energy sources. In proposed BESS capacity procurement, MSEDCL has planned to utilize day-time excess solar energy from MSKVY 2.0 projects for charging purposes and hence proposed procurement can be considered for fulfilling Energy Storage obligation.

- 11.8 Considering these factors, the proposed quantum of 250 MW/500 MWh (Base capacity) and 500/1000 MWh (additional Green Shoe) capacity of BESS procurement seems to be justified.
12. **Issue C: Whether tariff discover through competitive bidding is in accordance with market condition?**
- 12.1 MSEDCL stated that tariff discovered under the present bidding process i.e. Rs. 2,19,001 per MW per Month is reflective of market conditions and hence requested the Commission to adopt the same.

- 12.2 The Commission notes that in recently concluded BESS tenders, following tariffs have been discovered:

Entity	Bid details	Winning developers/ Capacity won	Final tariff in Rs./MW/Month	Tariff discovered in the month
SECI	SECI, 1000 MW/2000 MWh, Storage BESS-II, Delhi, Jun-2024	JSW Neo Energy, 500 MW/1000 MWh	3,81,000	Sep-24
		Reliance Power, 500 MW/1000 MWh	3,81,999	Sep-24
GUVNL	GUVNL, 250+250 MW/500 MWh, Storage Phase-III, Gujarat, Mar-2024	Gensol Engineering Limited, 500 MW	3,72,978	Jun-24
GUVNL	GUVNL, 250 MW/500 MWh, Storage Phase-II, Gujarat, Nov-2023	Gensol Engineering Limited, 70 MW	4,48,996	Mar-24
		IndiGrid 2 Limited, 180 MW	4,49,996	

The discovered tariff in present procurement is well below the tariffs depicted in table above. Ideally, direct comparison of tariffs is not correct, as parameters like Round trip Efficiency, annual availability, arranging power for charging of BESS may differ from tender to tender. But considering distribution system requirement for accommodating excess solar energy, procurement at discovered tariff which is lowest amongst recent discovered tariff is justifiable.

- 12.3 The Commission notes that the proposed projects are eligible for Viability Gap Funding up to 30% of capital cost for BESS or Rs. 27 Lakhs per MWh from Ministry of Power.

Further, the projects under considerations are being developed within Maharashtra and connected to MSEDCL Substations with feeders with MSKVY 2.0. Hence, impact of Inter State transmission charges and losses are not applicable. Considering the same, it can be concluded that the Tariff discovered in the present bidding process is reflective of the current market trends.

- 12.4 Accordingly, in line with the mandate under Section 63 of the Electricity Act 2003, the Commission deems it fit to adopt and approve tariff Rs. 2,19,001 per MW per Month BESS capacity procurement on long term basis (for the period of 12 years).

13. Hence, the following Order:

ORDER

1. **Petition in Case No. 173 of 2024 is allowed and IA filed therein is disposed of accordingly.**
2. **Maharashtra State Electricity Distribution Co. Ltd's proposal for procurement of 250 MW/500 MWh (Base capacity) and 500/1000 MWh (additional Green Shoe) capacity of Battery Energy Storage System at tariff of Rs. 2,19,001 per MW per Month discovered through competitive bidding for 12 years is approved.**
3. **The power procured from projects considered in this Petition be eligible for meeting the Energy Storage Obligation.**
4. **The Battery Energy Storage Purchase Agreement with successful bidder be executed within (30) days from the date of this Order and copy of the same shall be submitted for records of the Commission.**

Sd/-
(Surendra J. Biyani)
Member

Sd/-
(Anand M. Limaye)
Member

Sd/-
(Sanjay Kumar)
Chairperson


(Dr. Rajendra G. Ambekar)
Secretary

