

**MADHYA PRADESH ELECTRICITY REGULATORY COMMISSION**

**5<sup>th</sup> Floor, "Metro Plaza", Bittan Market, Bhopal - 462016**



**Petition No. 13 of 2024**

**PRESENT:**

**S.P.S Parihar, Chairman**  
**P.K. Chaturvedi, Member**  
**Gopal Shrivastava, Member (Law)**

**IN THE MATTER OF:**

Petition under section 86(1)(e), section 61(h) of the Electricity Act, 2003 for determination of Pre-fixed levelized tariff for sale of power from decentralized Solar Power Plants having capacity of five hundred (500) kW to two (2) MW or such other capacity as per notification of Govt. of India, to be set up under Component-A of the Pradhan Mantri Kisan Urja Surakhsha evam Utthan Mahabhayan (PM-KUSUM) Scheme introduced by Government of India (GoI).

**Madhya Pradesh Urja Vikas Nigam Ltd.,**

Urja Bhawan, Bhopal, Madhya Pradesh

**- Petitioner**

**Vs.**

**1. Managing Director, MP Power Management Co. Ltd.,**

Shakti Bhawan, Vidyut Nagar, Jabalpur, 482008

**2. Managing Director, MP Madhya Kshetra Vidyut Vitran Co. Ltd.,**

Nishtha Parisar, Govindpura, Bhopal, 462023 - Respondent(s)

**3. Managing Director, MP Paschim Kshetra Vidyut Vitran Co. Ltd.,**

GPH, Pologround, Indore, 452003

**4. Managing Director, MP Poorva Kshetra Vidyut Vitran Co. Ltd.,**

Shakti Bhawan, Vidyut Nagar, Jabalpur, 482008

**- Respondents**

**ORDER**

**(Passed on this day of 20<sup>th</sup> June 2024)**

Shri Nirmal Dubey and Smt Vandana Chatterjee appeared on behalf of the petitioner. Shri Manoj Dubey, Advocate, appeared on behalf of the respondent no. 1. None appeared on behalf of the respondents no. 2 to 4.

1. The subject petition is filed for determination of pre-fixed levelized tariff for sale of power from decentralized Solar Power Plants having capacity of five hundred (500) kW to two (2) MW or such other capacity as per notification of Govt. of India, to be set up under Component-A of the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PMKUSUM) Scheme introduced by Government of India (GoI). The petition is filed under section 86(1)(e) and section 61(h) of the Electricity Act 2003.
2. The petitioner submitted the following in the subject petition:
  - (i) Ministry of New and Renewable Energy (MNRE) launched the guidelines for implementation of Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) Scheme on 22nd July 2019. These guidelines have been amended from time to time till date (recent amendment to guidelines issued on 17 January 2024).
  - (ii) This scheme has provision for the decentralized ground mounted grid connected renewable energy plants, standalone solar powered agriculture pumps and solarization of grid connected agriculture pumps.
  - (iii) MNRE has designated MPUVNL as the State Implementing Agency (SIA) vide letter No: F. No. 32/54/2018 – SPV Division, dated 26th November 2019 for implementation of Component A of PM KUSUM Scheme in the state of Madhya Pradesh. MNRE allocates targets to SIA for every year on regular basis and, SIA is responsible for implementation of projects within the defined timeframe.
  - (iv) For successful implementation of the scheme, a pre-fixed levelized tariff needs to be determined. The petitioner further submitted that previously the Commission had issued order on the subject matter dated 16.02.2021 (petition no. 50/2020) and determined pre-fixed levelized tariff for a 3-year control period. Subsequently, in view of experience and market dynamics in implementation of component A of PM KUSUM Scheme, a petition no. 29/2023 was filed by the petitioner for revision of above tariff. However, the Commission, while disposing off the petition, directed the Petitioner to file appropriate petition for

determination of pre-fixed levelized tariff for next control period commencing from April 2024.

- (v) As per the directives of the Commission, the petitioner has filed the present petition for determination of pre-fixed levelized tariff for sale of power from decentralized Solar Power Plants having capacity of five hundred (500) kW to two (2) MW or such other capacity as per notification of Govt. of India, to be set up under Component-A of the PM KUSUM Scheme.

**A. Background of Component A of PM KUSUM Scheme:**

- (i) MNRE has given the target of two hundred (200) MW vide order dated 18 May 2022 and hundred (100) MW vide order dated 28 June 2023 for installation of Decentralized Renewable Energy Power Plant (**REPP**) of capacity five hundred (500) kW to two (2) MW or such other capacity as per notification of Govt. of India.
- (ii) Such REPP will be setup by individual farmers/ group of farmers/ cooperatives/ panchayats/ Farmer Producer Organizations (FPO)/Water User associations (WUA) or project developer hereinafter called Renewable Power Generator (RPG).
- (iii) The REPP will preferably be installed within five (5) km radius of the sub-stations identified by the DISCOMs in order to avoid high cost of sub-transmission lines and to reduce transmission losses.
- (iv) The identified list of sub-stations is being notified and updated on the website of SIA from time to time.
- (v) In case the farmers/ group of farmers/ cooperatives/ panchayats/ FPO/ WUA etc. are not able to arrange equity required for setting up the REPP, they can opt for developing the REPP through project developer.
- (vi) In such a case, the landowner will get lease rent as mutually agreed between the parties. The lease rent may be in terms of Rs per year per acre of land or in terms of Rs per unit energy generated.
- (vii) The REPP under the scheme would be implemented primarily on barren land or such other lands as prescribed in relevant guidelines for Component-A of PM KUSUM Scheme from time to time.

**B. Provisions for Implementation Mechanism for Component A of PM - KUSUM Scheme:**

- (i) DISCOM shall assess and notify RE generation capacity that can be injected in to all DISCOM sub-station in the state and place such notification on the website of SIA for information of all stakeholders.
- (ii) To facilitate farmers willing to lease out their land for development of RE plants preferably within five (5) km of radius of the notified substation(s), as per provisions of this scheme, list of such farmers received through online EoI is being placed by SIA on their website. However, the leasing of land of any farmers will be a bi-partite agreement between the farmer and the project developer and DISCOM/ SIA will not be held responsible for failure in getting the land leased out to the RPG.
- (iii) SIA is inviting DISCOM sub-station wise proposal from RPG to participate in appropriately designed transparent selection process for development of decentralized renewable power plants. The RPG shall submit their proposal as per relevant process and procedure notified by SIA from time to time. An RPG will not be allowed to apply for more than one REPP for a particular DISCOM sub-station.
- (iv) REPP of capacity from 500 kW up to two (2) MW, or such other capacity as per notification of Govt. of India, to be connected at eleven (11) kV or thirty-three (33) kV side of DISCOM sub-station, or such other voltage level in accordance with MNRE Guidelines, and the selected RPG will be responsible for laying of such dedicated line from REPP to such sub-station, construction of bay and related switchgear at the sub-station where the REPP is connected to the grid and metering is done. To meet additional demand at a substation, DISCOM may augment the capacity of sub-station under any other scheme as appropriate.
- (v) Alternatively, RPG can get constructed such dedicated lines, bay(s) or related switchgear through DISCOM by paying the applicable cost and other charges. RPG will be responsible for maintaining such dedicated line from REPP to concerned sub-station

**The petitioner proposed following General and Project specific operational Principles for tariff determination in the instant petition: -**

## **C. General Principle**

### **i. Control Period:**

The petitioner submitted that tariff certainty is required for consistent progress and successful implementation of the scheme in the state. Hence it is submitted that the validity of the tariff determined by the Commission shall be kept for one (1) year from the notification of this order. It is further submitted in the petition that in view of changing market dynamics, the tariff may be reviewed on Suo-motu basis by the Commission or on an application filed by Petitioner in the interest of scheme implementation.

## **D. Project Specific Principles submitted by the petitioner**

### **1. Operational Parameters for determination of pre-fixed levelized tariff for REPPs:**

#### **i. Useful Life of a REPP:**

It is submitted that the life of a REPP including evacuation system till substation may be considered as 25 years, as per CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulation 2020 dated 23rd June 2020 (CERC RE Tariff Regulation 2020).

#### **ii. Capacity Utilization Factor (CUF):**

The petitioner has proposed capacity utilization Factor (CUF) of 21% over the useful life of an REPP without considering any system degradation. It was reported that MPPMCL has recommended the CUF of 21% based on operational performance of large-scale ground mounted solar projects located in Rewa. Therefore, CUF of 21% per annum is considered over the useful life of an REPP without considering any system degradation.

#### **iii. Auxiliary Consumption:**

The petitioner has proposed auxiliary consumption of 0.75% of gross generation for tariff determination purpose as recommended in CERC RE Tariff Regulations 2020.

### **2. Financial Parameters for determination of pre-fixed levelized tariff for REPPs:**

#### **i. Debt Equity Ratio:**

The petitioner has proposed Debt Equity ratio of 70:30 for tariff determination purpose as recommend in CERC RE Tariff Regulation 2020 and MPERC (Terms and condition for Tariff determination of energy from Renewable Energy Sources) Regulation 2017.

ii. **Capital Cost:**

- a. The petitioner submitted that like any product and its price life cycle, the pricing dynamics for solar system is evolving and unpredictable. Further, despite continuous evolution in Renewable Energy Technologies, a host of critical factors (like demand-supply gap, import dependency and un-economies of scale and nature of stakeholders) add differentiated dynamics to projects envisaged under PM KUSUM Scheme. Hence, it is pertinent to apply reasonableness and consider capital cost, as per the prevailing market dynamics, to arrive at pre-fixed levelized tariff for projects under component A of PM KUSUM Scheme.
- b. It is submitted that on reviewing of progress in case of Component C of PM KUSUM Scheme (where INR 1.05 crore/ MW subsidy is provided from GoI) and latest tariff order passed by Himachal Pradesh Electricity Regulatory Commission (HPERC) for small scale solar projects on 4 November 2023, the Petitioner is of considered view to adopt the latest capital cost of the project as per market dynamics should be considered to determine pre-fixed levelized tariff for new control period.
- c. It is submitted that the petitioner and MPPMCL (Respondent no. 1) had few rounds of discussion to device methodology agreeable to Respondent no. 1 on capital cost of projects under Component-C of PM KUSUM Scheme. Accordingly, as per petitioner, following approach for determination of capital cost was agreeable to Respondent no. 1:

<b>Cost breakup</b>	<b>Unit</b>	<b>Rate</b>	<b>Amount</b>
Cost of solar module in international market as per India-RE-Navigator for month of Dec-2023	Cents USD/ Wp		11.1
	INR/ Wp	83.22 (USD to INR)	9.24
Overheads from port to site	%		2.3%
Cost of solar module (at site)	INR/ Wp		9.45

Cost of solar module	INR Lakh /MW		94.50
Overload (DC/AC Ratio)	INR Lakh /MW	10.00%	103.95
Impact of BCD (basic customs duty)	INR Lakh /MW	40.00%	41.58
Cost of solar module after BCD	INR Lakh /MW		145.53
Inverter	INR Lakh /MW		44.03
Balance of System (BOS)	INR Lakh /MW		95.95
Capital cost before taxes and other expenses	INR Lakh /MW		285.51
GST for 70% of capital cost	INR Lakh /MW	12%	23.98
GST for 30% of capital cost	INR Lakh /MW	18%	15.42
Total capital cost after SGD (Safe guard duty) /BCD and GST (Goods and service tax)	INR Lakh /MW		324.91
Cost of Constructing 11 kV Transmission line (5 KM)	INR Lakh /KM	3.21	16.05

Cost of Developing 11 kV Bay and related switchgear	INR Lakh	6.96	6.96
Total Capital Cost including Transmission line and related switchgear	INR Lakh /MW		<b>347.92</b>

- d. It is submitted that, as projects under Component A of PM KUSUM Scheme setup in Madhya Pradesh are of 0.5 MW to 2 MW on agricultural lands, above capital cost agreed by Respondent no. 1 was considered for the purpose of determination of pre-fixed levelized tariff under the instant petition i.e. INR 347.92 lakh/ MW.

### 3. Interest and Tenure of Loan:

- a. It is submitted that Interest rate for both deposits and loans keep on changing with advent time. Moreover, on the basis submissions of documents submitted by developers, it is noted by the Petitioner that the lending rate of solar projects are in the range of 10.50% to 11.45%. So, the petitioner has relied on the latest regulation published by Hon'ble CERC. i.e. CERC RE Tariff Regulation 2020 for Interest and Tenure of Loan.
- b. It is submitted that the petitioner has considered normative interest rate of 10.53% for tariff determination purpose as per CERC RE Tariff Regulation 2020. It is submitted that the CERC RE Tariff Regulations 2020 specifies that "normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months shall be considered for tariff determination purpose.

**Table: MCLR Rate of SBI**

Month	SBI MCLR rate (one-year tenor)
September 2023	8.55%



August 2023	8.55%
July 2023	8.55%
June 2023	8.50%
May 2023	8.50%
April 2023	8.50%
Average of 6 months	8.53%

- c. Accordingly, Interest on Loan is considered as 10.53% (8.53% + 2.00 %) per annum.
- d. It is submitted that the loan tenure for solar projects is in the range of 8 to 20 years for solar projects. In line with the current market trends and as per CERC RE Tariff Regulation 2020, the tenure of loan is considered as 15 years for tariff computation.

#### 4. Return on Equity (RoE):

- a. It is submitted that as per CERC RE Tariff Regulation 2020, “The normative Return on Equity shall be 14%. The normative Return on Equity shall be grossed up by the latest available notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the latest available notified Corporate Tax rate for the remaining Tariff Period”. The petitioner has considered the RoE as recommended under CERC RE Tariff Regulations 2020.
- b. Latest available MAT rate is 15% plus applicable surcharge (7%) and Health and Education Cess (4%).
- c. Latest Corporate Tax applicable is 25% for domestic company, plus applicable surcharge (7%) and Health and Education Cess (4%).
- d. Hence Pre-tax RoE for first 20 years considered for the determination of tariff is as given below:

$$\text{Applicable MAT} = 15\% * 1.07 * 1.04 = 16.69\%$$

$$\text{Pre-tax RoE} = \text{Base Rate} / (1 - \text{tax rate}) = 14\% / (1 - 16.69\%) = 16.81\%$$

- e. Pre-tax RoE for the remaining Useful Life considered for the determination of tariff is as given below.

$$\text{Applicable Corporate Tax Rate} = 25\% * 1.07 * 1.04 = 27.82\%$$

$$\text{Pre-tax RoE} = \text{Base Rate} / (1 - \text{tax rate}) = 14\% / (1 - 27.82\%) = 19.40\%$$

#### 5. Discount Rate:

- a. It is submitted that the petitioner has considered Discount Rate equivalent to post-tax weighted average cost of capital for the purpose of levelized tariff calculation as provided in the CERC RE Tariff regulation 2020.

$$\text{Discount Rate} = [(\text{Debt component} \times \text{Interest on debt}) \times (1 - \text{Corporate Tax})] + (\text{Equity component} \times \text{RoE}) = [(70\% \times 10.53\%) \times (1 - 27.82\%)] + (30\% \times 14\%) = 9.52\%$$

Hence, Discount Rate is considered as 9.52% per annum by the petitioner.

#### 6. Depreciation:

It is submitted that as per CERC RE Tariff Regulation 2020, the Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset. Hence, 70% of the capital cost of asset is proposed to be depreciated up to the loan tenure and 20% of the capital cost of asset is proposed to be depreciated over the remaining Useful Life of the Project.

#### 7. Operation and Maintenance Cost and escalation:

- a. It is submitted that the operation and maintenance expenses comprise of manpower expenses, insurance expenses, spares and repairs, consumables and other expenses. Moreover, the expense of manpower keeps on increasing and O&M of a REPP is more of services related work.
- b. The petitioner has considered O&M expenses for first year of operation as Rs 7 lakh/MW as per MPERC (Terms and condition for Tariff determination of energy from Renewable Energy Sources) Regulation 2017. An escalation factor of 3.84% per annum has been considered for second year onward as per CERC RE Tariff Regulation 2020.

**8. Working Capital:**

The petitioner has considered working capital requirement as MPERC (Terms and condition for Tariff determination of energy from Renewable Energy Sources) Regulation 2017, the working capital is comprised of following components:

<b>O&amp;M Cost</b>	1 Month
<b>Maintenance Spare</b>	15% of O&M Cost
<b>Receivable</b>	2 Months of energy charges for sale of electricity, calculated on the normative CUF.

**9. Interest on Working Capital:**

- a. It is submitted that as per CERC RE Tariff Regulation 2020, “normative interest rate of three hundred fifty (350) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months shall be considered”.
- b. It is submitted that average of SBI MCLR (one-year tenor) of last six months (from April 2023 to September 2023) is 8.53%. Therefore, for the computation of pre-fixed levelized tariff, the Petitioner has considered the Interest on Working Capital as 12.03% (8.53% + 3.50%) per annum.

**10. Lease Rent to be paid to farmers and its escalation.**

- a. It is submitted that since, the guidelines for component A of PM KUSUM have provision to provide land to RPG on lease basis, it is necessary that farmer should get the lease rent in 25 years which must be equivalent to the current procurement cost of the land under the policy.

**The Summary of Operational and Financial Parameters proposed by the petitioner for determination of pre-fixed levelized tariff for REPPs under Component A of PM KUSUM scheme is provided in table below:**

Life of a plant	25 years
CUF	21%
Auxiliary Consumption	0.75%

Debt Equity Ratio	70:30
Capital Cost	Rs 347.92 Lakh / MW
Loan Tenure	15 years
Interest on Loan	10.53%
Pre-tax RoE till 20 Years	16.81%
Pre-tax RoE for remaining Useful Life of REPP	19.40%
Discount Rate	9.52%
Salvage Value of Asset	10%
Depreciation up to loan period (remaining value to be spread equally over the remaining life of the project)	4.67%
Interest on Working Capital	12.03%
O&M cost (3.84% escalation from second year)	Rs. 7 Lakh / MW

The petitioner with above mentioned parameters computed pre-fixed levelized tariff of Rs **3.22/kWh** for sale of electricity from REPPs set up under component A of PM KUSUM scheme.

**The Petitioner has made following prayers in the instant petition:-**

- i. Take the accompanying petition on record and treat it as complete.*
- ii. Considering the facts and circumstances mentioned in the petition, the Hon'ble commission may be pleased to determine the pre-fixed levelized tariff of Rs. 3.22 per unit for sale of power from decentralized solar power plants to the state DISCOMs under Component A of PM KUSUM Scheme.*

- iii. *The pre-fixed levelized tariff determined shall remain valid till one year from the notification of the Order. However, in view of changing market dynamics, it may be reviewed suo-motu by Hon'ble Commission or on an application filed by Petitioner in the interest of scheme implementation, in similar manner as being taken up by Hon'ble Himachal Pradesh Electricity Regulatory Commission (HPERC) for last a few years.*
- iv. *Condone any inadvertent omissions/ errors/ shortcomings/ delays and permit the petitioners to add/ change/ modify/ alter this filing and make further submissions as may be required at a later stage.*
- v. *Pass such an Order as the Hon'ble Commission deems fit and proper as per the facts and circumstances of the case.*
3. At the motion hearing held on 06.02.2024, the petition was admitted by the Commission. The petitioner was directed to serve a copy of the petition to the respondents immediately. The respondents were directed to file their response within 15 days of receipt of the petition copy. Petitioner was allowed to submit rejoinder if any within 3 days thereafter.
4. Respondent no. 1 vide letter dated 15.03.2024 submitted that the relief claimed by the petitioner appears to be just and proper and therefore are not disputed. The relief claimed may be granted as prayed for by the petitioner.
5. At the hearing held on 19.03.2024, petitioner reiterated their prayer for determination of ceiling tariff for Component A of PM Kusum Yojna beyond 31.03.24. Respondent no. 1 supported the prayer made in the petition. Having heard the parties, the petitioner was directed to submit draft of public notice to the Commission within 3 days of the order. Public hearing shall be held thereafter.
6. The public notice on the gist of subject petition was published in newspapers on 23.05.2024. A copy of the subject petition along with the public notice had also been uploaded on Commission's website. Persons intending to file suggestions/ objections / comments on the above petition were allowed to make submission in writing so as to reach the Commission latest by **14.06.2024**.
7. The Public Hearing in the matter was held on 18.06.2024 through Video Conferencing. The Commission did not receive any suggestion/ objections / comments on the petition filed by the petitioner from any of the stakeholder as on last date of receipt of such submission i.e.. 14.06.2024. During public hearing also, respondents supported the prayer made in the petition.

## Commission's analysis and rulings

8. At the outset, it is made clear that the Commission, in this Order, is carrying out limited exercise for determination of ceiling tariff for purchase of power by Discoms from decentralized Solar Power Plants having capacity of 500 kW to 2MW to be set up by individual farmers/group of farmers /cooperatives /panchayats / Farmer Producer Organizations (FPO) /Water User Associations (WUA) in the vicinity of rural grid sub-stations under Component-A of the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) Scheme introduced by Government of India (GoI).
9. The Commission vide its order dated 16.02.2021 in the petition no. 50 of 2020 named M.P. Urja Vikas Nigam Limited V/s MPPMCL and others dealt with the issue of determination of ceiling Tariff for sale of power from decentralized solar power plants having capacity of 500 kW to 2MW to be set up under Component-A of the Pradhan Mantri Kisan Urja Surakhsha Evam Utthan Mahabhiyan(PM-KUSUM) Scheme introduced by Government of India.

The relevant paragraphs of the aforesaid judgment are reproduced as below:

*“71. Based on the aforesaid parameters, the Commission has determined the pre fixed levelized tariff of Rs. 3.07 / kWh under Component-A of KUSUM Scheme for entire life of the project commissioned till 31st March’ 2024. This will act as a ceiling tariff for the competitive bidding in this matter. The duration of PPA shall be 25 years for all projects covered under this scheme. The computational details are placed at Annexure – A”.*

10. Post issuance of above order, some of solar generator/developers had approached the Commission in petitions No. 55 to 60 of 2022 for awarding suitable compensation to the developers in tariff determined vide order dated 16.02.2021 on account of imposition of BCD, increase in GST rates, increase in cost of solar panels/ modules, cost of evacuation line, rise in steel prices etc. Commission disposed of the aforesaid petitions vide a common order **dated 30.12.2022**.

The relevant paragraphs of the aforesaid judgment are reproduced as below:

*“The Commission directs the petitioners to submit detailed computation of impact on account of GST rate increase along with invoices of procurement of solar PV cells / modules from the date as mentioned in paragraph 20 above to the bidding agency i.e. respondent no. 1 (MPUVNL) who shall verify the same and approach this Commission for approval of quantum of compensation and mechanism for passing on the approved compensation to the petitioners in their monthly power purchase bills to be sent to respondent no. 2 i.e. MPPMCL.”*

11. Subsequently, in view of experience and market dynamics in implementation of component A of PM KUSUM Scheme, the MP Urja Vikas Nigam Ltd had filed a petition no 29/2023 before the Commission for upward revision of pre-fixed levelized tariff determined by the Commission vide order dated 16.02.2021. The Commission vide order dated 09.10.2023 disposed of the petition and directed the petitioner to file an appropriate petition for determination of pre-fixed levelized tariff for the next control period commencing from April 2024.
12. The Commission has noted that the Ministry of New and Renewable Energy (MNRE) has notified Comprehensive guidelines for implementation of Pradhan Mantri Kisan Urja Evam Uttan Mahabhiyaan (PM-KUSUM) scheme vide OM 32/645/2017-SPV Division dated 17.01.2024

That the PM-KUSUM scheme focuses on the three components viz:

- a) **Component-A:** Setting up of 10,000 MW of Decentralized Ground/ Stilt Mounted Grid Connected Solar or other Renewable Energy based Power Plants by the farmers on their land.
  - b) **Component-B:** Installation of 14 Lakh Stand-alone Solar Agriculture Pumps
  - c) **Component-C:** Solarization of 35 Lakh Grid Connected Agriculture Pumps including Feeder Level Solarization
13. As per the Implementation mechanism specified in the said guidelines the DISCOM / SIA shall invite applications for Expression of Interest (EOI) from prospective RPGs, through their online portal and the pre-fixed levelized tariff determined under this order shall act as ceiling tariff for such bids.
  14. In case the total aggregate capacity of eligible applications received for a particular substation is less than or equal to the capacity notified for connectivity at the sub-station, Letter of Award (LoA) will be awarded to all eligible applicants for procurement of renewable power at a **pre-fixed levelized tariff** on first come first serve basis within one month from the receipt of application.
  15. That the present petition is filed by the petitioner, MPUVNL for determination of pre-fixed levelized tariff for sale of power from decentralized Solar Power Plants having capacity of five hundred (500) kW to two (2) MW or such other capacity as per notification of Govt. of India, to be set up under Component-A of the PM KUSUM Scheme to the MPPMCL / DISCOM of the state for next control period.
  16. In view of aforesaid background and observation, the Commission now proceeds for determination of pre-fixed levelized tariff for sale of power from decentralized Solar Power

Plants having capacity of five hundred (500) kW to two (2) MW or such other capacity as per notification of Govt. of India, to be set up under Component-A of the PM KUSUM Scheme to the MPPMCL / DISCOM of the state for next control period

### **Tariff Design**

17. The Commission has considered a cost-plus tariff approach based on reasonable operational and financial norms for determining pre-fixed levelized tariff for Solar Power projects to be set up under PM KUSUM scheme – Component - A. The levelization shall be carried out over the useful life of the plant. The Commission’s views on the key elements that influence the determination of tariff are discussed in subsequent paras of this order.

### **Control Period**

#### **Petitioner’s Submission**

18. The Petitioner has proposed that the validity of the tariff determined by the Commission remain one year from the issue of this order. The petitioner has also requested that in view of the changing market dynamics, the tariff may be reviewed suo-motu by the Commission or on an application filed by the Petitioner in the interest of scheme implementation.

#### **Commission’s View**

19. The Commission is of the opinion that for regulatory certainty to the stakeholders, a control period of three years is advisable and therefore has decided to fix the control period of this order from the date of notification of order till 31<sup>st</sup> March 2027.
20. The Commission, however, noted that the Solar PV is an emerging technology which is highly sensitive to the market conditions as well as technological development. The Capital cost of Solar PV is prone to vary over a relatively short time span. In view of above, as and when need arises, the Commission is open for tariff determination in the middle of the control period also, if an appropriate petition is filed by the petitioner in the interest of scheme implementation and benefit of stakeholders.

### **Capital Cost**

#### **Petitioner’s Submission**

21. With regard to Capital Cost of the Project, the petitioner has submitted that latest capital cost of the project as per the market dynamics should be considered to determine pre-fixed levelized tariff for new control period. Petitioner is relied on the experience gathered in implementing projects under Component C of PM KUSUM Scheme. The Capital cost of Rs 347 lakhs per MW for Solar Project is proposed by the petitioner in consultation with the MPPMCL, Respondent



no. 1 in the instant petition for tariff determination purposes during new control period. The petitioner has also considered land lease rent @ Rs 1.82 Lakh/MW per annum.

### Commission's View

22. The Commission observed that the Capital Cost of Solar PV project primarily consists of cost of Solar PV module, Inverter and Balance of System (BoS). The Commission also noted that Solar PV module is the single largest component of Capital Cost of the project which is highly sensitive to the market conditions as well as technological development. Besides these costs, the solar generator is also responsible for purchase / lease out of the land for Project and laying the evacuation line from the project location to the nearest DISCOM sub-station within the radius of 5 KM as per implementation guidelines for Component A of PM KUSUM scheme.

In order to arrive at the Capital cost benchmark for Solar Project for new control period, the Commission perused the approach followed by the other SERCs while determining the tariff for the solar power projects under Component A of the PM KUSUM scheme. The Commission has also examined the tariff discovered in other states and adopted by the SERCs for similar solar projects to be set up under Component A of the PM KUSUM scheme.

After examination, the Commission has considered the Solar PV module cost in market during Q1 of FY 2024-25, applicable Basic Custom duty and Goods and Service Tax (GST) as per current regime and benchmarked the capital cost for new control period as given below:

S No	Particulars	Unit	Rate	Amount
1	Cost of Solar Module in international market during Q1 FY 2024-25	Cents USD/W <sub>p</sub>	11.00	
3	Conversion Rate	INR to USD	83.57	9.19
4	Overhead from Port to site	%	2.3	
5	Cost of Solar Module at site	INR / W <sub>p</sub>		9.4
6	Cost of Solar Module	INR Lakh/MW		94.00
7	AC: DC over loading	%	10	
8	Cost of Solar Module at AC side	INR Lakh/MW		103.4
9	Impact of Basic Custom Duty (BCD)	%	40	41.36

10	Cost of Solar Module after BCD			144.76
11	Inverter	INR Lakh/MW		44.03
12	Balance of System (BoS)	INR Lakh/MW		95.95
	Capital Cost before Tax	INR Lakh/MW		284.74
	GST for 70% of CC comp	%	12%	23.92
	GST for 30% of CC comp	%	18%	15.38
13	Total Capital Cost after Tax and Duties	INR Lakh/MW		324.03
14	Cost of constructing 11 KV line (5 KM)	INR Lakh/Km	3.21	16.05
15	Cost of developing Bay and Switchgear			6.96
16	<b>Total Capital Cost (Rs Lakh)</b>			<b>347.04</b>

23. As given above, the Commission decided to fix the Capital Cost of **Rs 347.04 lakh/MW** for the solar power projects of 500 KW to 2 MW capacity to be set up in the State under Component A of PM KUSUM scheme during the control period of this tariff order. The Capital cost as above is inclusive of cost of evacuation line up to the nearest DISCOM sub-station but exclusive of land cost / land lease rent payable by Solar generator / developer.

### Useful Life of Plant Life

#### Petitioner's Submission

24. The petitioner has proposed the life of a REPP including evacuation system up to substation shall be considered as 25 years, as per CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulation 2020 dated 23<sup>rd</sup> June 2020.

#### Commission's View

25. The Commission has decided to fix the useful life of plant including evacuation system up to substation as 25 years for tariff determination purpose. The Commission observed that this is in line with CERC RE Tariff Regulations 2024.

### **Capacity Utilization Factor**

#### **Petitioner's Submission**

26. The petitioner has proposed capacity utilization Factor (CUF) of 21% over the useful life of an REPP without considering any system degradation. It is submitted by the petitioner that MPPMCL has recommended the CUF of 21% based on operational performance of large-scale ground mounted solar projects located in Rewa

#### **Commission's View**

27. The Commission examined the operational data of sample Solar Projects in the state and noticed that a significant portion of power projects, when operating at full capacity, have achieved an average capacity utilization factor (CUF) of approximately 21% over the preceding three years (2021-2023). In view of this, the Commission has decided to fix the normative CUF of 21% for tariff determination purpose.

### **Auxiliary Power Consumption**

#### **Petitioner's Submission**

28. The petitioner has proposed auxiliary consumption of 0.75% of gross generation for tariff determination purpose as recommended in CERC RE Tariff Regulations 2020.

#### **Commission's View**

29. The Commission agrees to the proposal as it is in line with recommendation under CERC RE Tariff Regulations 2024. The Commission has decided to fix auxiliary consumption of 0.75% of gross generation for tariff determination purpose.

### **Debt Equity Ratio**

#### **Petitioner's Submission**

30. The petitioner has proposed Debt Equity ratio of 70:30 for tariff determination purpose as recommend in CERC RE Tariff Regulation 2020 and MPERC (Terms and condition for Tariff determination of energy from Renewable Energy Sources) Regulation 2017.

#### **Commission's View**

31. The Commission has considered Debt Equity ratio of 70:30 for tariff determination purpose.

**Interest and Tenure of Loan**

**Petitioner’s Submission**

32. The petitioner has considered normative interest rate of **10.53%** for tariff determination purpose as per CERC RE Tariff Regulation 2020. It is submitted that The CERC RE Tariff Regulations 2020 specifies that “normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months shall be considered for tariff determination purpose.

**Commission’s View**

33. The Commission noted that CERC RE Tariff Regulations 2024 also specify that “normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months should be considered for tariff determination purpose. Commission has therefore decided to fix the interest on loan equal to normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months for tariff determination purpose. SBI MCLR (one-year tenor) prevalent during last six months is given the interest on loan component has been fixed at 10.63% per annum as provided in the table below:

**Table: Normative Interest on loan**

Month	SBI MCLR rate (one-year tenor)
April 2024	8.65%
March 2024	8.65%
Feb 2024	8.65%
Jan 2024	8.65%
December 2023	8.65%
November 2023	8.55%
Average of 6 months	8.63%

Interest on Loan is accordingly fixed as 10.63% (8.63% + 2.00 %) per annum.

34. CERC in RE Tariff Regulations, 2024 has considered the loan tenure of 15 years for renewable power projects mentioning that various financial institutions provide loan tenure ranging from 10-15 years. It is observed by the Commission that many RE technologies including Solar PV

have achieved maturity level, it is now possible for the developers to get loan from lenders/financial institutions for longer duration. Commission therefore agrees with the proposal of petitioner and has decided to fix the tenure of loan repayment as 15 years.

### **Return on Equity**

#### **Petitioner's Submission**

35. The petitioner has considered the normative Return on Equity of 14%. It is proposed that the normative Return on Equity shall be grossed up by the latest available notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the latest available notified Corporate Tax rate for the remaining Tariff Period. The petitioner has considered the RoE as recommended under CERC RE Tariff Regulations 2020.

#### **Commission's View**

36. The Commission observed that the CERC RE Tariff Regulations 2024 recommend normative Return on Equity of 14% (except small Hydro Projects). The normative Return on Equity shall be grossed up by the latest available notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the latest available notified Corporate Tax rate for the remaining Tariff Period. Accordingly, the Commission has decided to fix the Pre-tax RoE of 16.81% for first 20 years of the Tariff period and Pre-tax RoE of 19.40 % for balance 5 years of the Tariff period (considering MAT rate as 15% and Corporate Tax as 25% with applicable surcharge @7% and Health & Education Cess @ 4%).

### **Discount Rate**

#### **Petitioner's Submission**

37. The Petitioner has considered Discount Rate equivalent to post-tax weighted average cost of capital for the purpose of levelized tariff calculation as provided in the CERC RE Tariff regulation 2020.

#### **Commission's View**

38. The Commission noted that CERC RE Tariff Regulations 2024 recommend the same methodology for computation of Discount Rate as proposed by the petitioner. Commission has therefore decided to consider Discount Rate equivalent to post-tax weighted average cost of capital for the purpose of levelized tariff calculation as elaborated below:

**Discount Rate = [(Debt component X Interest on debt) X (1 – Corporate Tax)] + (Equity component X RoE)**

$$= [(70\% \times 10.63\%) \times (1 - 27.82\%)] + (30\% \times 14\%) = 9.57 \%$$

## Depreciation

### Petitioner's Submission

39. The petitioner has proposed that as per CERC RE Tariff Regulation 2020, the Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset. Hence, 70% of the capital cost of asset shall be depreciated up to the loan tenure and 20% of the capital cost of asset shall be depreciated over the remaining Useful Life of the Project

### Commission's View

40. The Commission observed that CERC RE Tariff Regulations 2024 specify similar approach. The regulations specify that the depreciation rate of 4.67% per annum shall be considered for the first 15 years and the remaining depreciation shall be evenly spread during the remaining Useful Life of the project. For this purpose, depreciation is computed from the first year of commercial operation. The Commission has decided to adopt the depreciation rate specified under CERC RE Tariff Regulations 2024 for tariff determination purpose.

## Working Capital Requirement

### Petitioner's Submission

41. The petitioner has considered working capital requirement as per MPERC (Terms and condition for Tariff determination of energy from Renewable Energy Sources) Regulation 2017. The working capital is comprised of following components:

<b>O&amp;M Cost</b>	1 Month
<b>Maintenance Spare</b>	15% of O&M Cost
<b>Receivables</b>	2 Months of energy charges for sale of electricity, calculated on the normative CUF.

### Commission's View

42. The Commission is in process of notifying revised Regulations on terms and conditions for determination of tariff for RE sources and therefore finds it more appropriate to refer to the norms specified in CERC RE Tariff Regulations 2024 for tariff determination purpose.

The Commission has accordingly decided to compute the working capital requirement as given below:

<b>O&amp;M Cost</b>	1 Month
<b>Maintenance Spare</b>	15% of O&M Cost
<b>Receivables</b>	45 days of tariff for sale of electricity, calculated on the normative CUF.

**Interest on Working Capital**

**Petitioner’s Submission**

43. The petitioner has considered normative interest rate of three hundred fifty (350) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months for determination of Interest on working capital in line with CERC RE Tariff Regulations 2020. The petitioner has proposed interest on working capital as 12.03% (8.53%+3.50%).

**Commission’s View**

44. The Commission observed that the CERC RE Tariff Regulations 2024 specify normative interest rate of three hundred twenty-five (325) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months for determination of Interest on working capital.

Accordingly, the Commission has decided to fix the interest on working capital as **11.88% (8.63% + 3.25 %) per annum based** on SBI MCLR (one-year tenor) prevailing during the last six months as given below:

**Table: Interest on Working capital**

Month	SBI MCLR rate (one-year tenor)
April 2024	8.65%
March 2024	8.65%
Feb 2024	8.65%
Jan 2024	8.65%
December 2023	8.65%
November 2023	8.55%
Average of 6 months	8.63%

### **Operation and Maintenance Cost and O&M escalation Rate**

#### **Petitioner's Submission**

45. The petitioner has considered O&M expenses for first year of operation as Rs 7 lakh/MW as per MPERC (Terms and condition for Tariff determination of energy from Renewable Energy Sources) Regulation 2017. An escalation factor of 3.84% per annum has been considered for second year onward as per CERC RE Tariff Regulation 2020.

#### **Commission's View**

46. The Commission has decided to consider O&M expenses for first year of operation as Rs 7 lakh/MW as per previous tariff order dated 16.02.2021 in the subject matter.
47. With regard to escalation rate for O&M expenses, the Commission observed that CERC under CERC RE Tariff Regulations, 2024 have revised the escalation rate for O&M expenses from 3.84% to 5.25% on the basis of WPI and CPI growth rate noticed in last five years. In view of this, the Commission has decided to fix the O&M escalation rate as 5.25% for tariff determination purpose.

### **Land Lease Rent**

#### **Petitioner's Submission**

48. The petitioner has submitted that since, the guidelines for component A of PM KUSUM have provision to provide land to renewable power generator (RPG) on lease basis, it is necessary that farmer should recover the lease rent in 25 years which must be equivalent to the current procurement cost of the land under the policy. Since the guidelines for component A of PM KUSUM has provision to provide land to RPG on lease basis, it is necessary that farmers should recover the lease rent in 25 years which must be equivalent to the current procurement cost of the land under the policy.

#### **Commission's View**

49. The Commission in its order dated 16.02.2021 passed in Petition no. 50 of 2020 has allowed land lease rent equal to Rs 1.82 Cr/ MW per annum with annual escalation of 5%. The Commission observes that the purpose of the PM - KUSUM scheme is to increase the income of farmers through lease of barren land which otherwise does not generate any income to the farmers. In view of this, the Commission decides to allow same land lease rent of Rs 1.82 Cr/ MW for first year of operation with annual escalation of 5% as already allowed in Petition no. 50 of 2020.



50. On the basis of aforementioned discussion, the Commission has decided to fix the operational and financial parameter as provided in table below for determination of pre-fixed tariff for Solar PV projects set up under Component A of PM KUSUM scheme

**Parameters considered for determination of tariff for Solar PV under KUSUM-A Scheme:**

Particulars	Units	
Number of days of Operation	Nos.	365
Plant Capacity	MW	1.00
Life of Plant	Years	25
Capacity Utilization Factor (CUF)	%	21
Auxiliary Energy Consumption	%	0.75
<b>Financial Parameters</b>		
Capital Cost excluding cost of land	Rs. Lakh	347.04
Debt : Equity ratio	Ratio	70 : 30
Loan Amount	Rs. Lakh	242.93
Equity Amount	Rs. Lakh	104.11
Normative ROE (Return of Equity)	%	14.00
Minimum Alternate Tax (MAT)	%	16.69
Corporate Tax (CT)	%	27.82
ROE till 20-years (Grossed up with MAT)	%	16.81
ROE after 20-years (Grossed up with CT)	%	19.40
Loan repayment period	Years	15
Moratorium Period	Years	0
Rate of Interest on Loan	%	10.63
Salvage value of Assets	%	10
Rate of Depreciation for first 15 years	%	4.67
Depreciation from 16 <sup>th</sup> year	%	2.00
O&M Expenses	Lakh/MW	7.00
Increment in O&M Expenses	%	5.25
Lease rent payable to farmers first year	Lakh/MW	1.82
Escalation on Lease rent	%	5.00
<b>Working Capital Components</b>		
O&M Cost	Months	1

Receivables	Months	1.5
Maintenance Spares as % of O&M Expenses	%	15
Rate of interest on working capital	%	11.88

- 51.** Based on the aforesaid parameters, the Commission has determined the pre-fixed levelized tariff of Rs.3.25/kWh for sale of electricity from Solar PV projects set up under Component-A of KUSUM Scheme for entire life of the projects commissioned till 31<sup>st</sup> March 2027. The tariff determined by the Commission shall act as a ceiling tariff for the competitive bidding. The duration of PPA shall be 25 years for all the projects covered under KUSUM A scheme. Tariff computation is attached as **Annexure A**.

**(Prashant Chaturvedi)**  
**Member**

**(Gopal Shrivastav)**  
**Member (Law)**

**(S.P.S Parihar)**  
**Chairman**

## ANNEXURE A

### TARIFF COMPUTATION SHEET FOR SOLAR PV PROJECTS UNDER COMPONENT A OF PM KUSUM – Tariff determined by the Commission – Rs 3.25/kWh

Tariff Calculations for PM KUSUM Component A																									
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Net Energy sold (lakh kWhs)	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26	18.26
<b>Costs</b>																									
O&M	7.00	7.37	7.75	8.16	8.59	9.04	9.52	10.02	10.54	11.09	11.68	12.29	12.93	13.61	14.33	15.08	15.87	16.71	17.58	18.51	19.48	20.50	21.58	22.71	23.90
Land lease	1.82	1.91	2.01	2.11	2.21	2.32	2.44	2.56	2.69	2.82	2.96	3.11	3.27	3.43	3.60	3.78	3.97	4.17	4.38	4.60	0.00	0.00	0.00	0.00	0.00
Depreciation (SLM)	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	16.20	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94
Interest on term loan	24.96	23.24	21.52	19.80	18.08	16.35	14.63	12.91	11.19	9.47	0.65	0.50	0.36	0.22	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	1.21	1.21	1.20	1.19	1.18	1.18	1.18	1.17	1.17	1.17	1.07	1.09	1.12	1.15	1.18	1.08	1.11	1.15	1.19	1.24	1.25	1.29	1.34	1.39	1.44
Return on Equity	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	20.19	20.19	20.19	20.19	20.19
<b>Total Cost (Rs lakh)</b>	<b>68.69</b>	<b>67.42</b>	<b>66.17</b>	<b>64.95</b>	<b>63.75</b>	<b>62.59</b>	<b>61.45</b>	<b>60.35</b>	<b>59.28</b>	<b>58.25</b>	<b>50.04</b>	<b>50.69</b>	<b>51.37</b>	<b>52.10</b>	<b>52.88</b>	<b>44.38</b>	<b>45.40</b>	<b>46.47</b>	<b>47.59</b>	<b>48.78</b>	<b>47.86</b>	<b>48.93</b>	<b>50.05</b>	<b>51.23</b>	<b>52.48</b>
<b>Per Unit Tariff (Rs/kWh)</b>	3.76	3.69	3.62	3.56	3.49	3.43	3.37	3.31	3.25	3.19	2.74	2.78	2.81	2.85	2.90	2.43	2.49	2.55	2.61	2.67	2.62	2.68	2.74	2.81	2.87
<b>Discount Rate (%)</b>	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57
<b>Discount Factor</b>	1.00	0.91	0.83	0.76	0.69	0.63	0.58	0.53	0.48	0.44	0.40	0.37	0.33	0.30	0.28	0.25	0.23	0.21	0.19	0.18	0.16	0.15	0.13	0.12	0.11
<b>Discounted Tariff</b>	3.76	3.37	3.02	2.70	2.42	2.17	1.95	1.74	1.56	1.40	1.10	1.02	0.94	0.87	0.81	0.62	0.58	0.54	0.50	0.47	0.42	0.39	0.37	0.34	0.32
<b>Levelized Tariff (Rs / kWh)</b>	<b>3.25</b>																								