Before

UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

Misc. Application No. 55 of 2025 (Suo-Motu)

In the matter of:

Review of the Benchmark Capital Cost for Solar PV, Solar Thermal and Grid Interactive Rooftop & Small Solar PV Plants to be applicable for FY 2025-26 and onwards till reviewed/revised by the Commission.

CORAM

Shri M. L. Prasad Chairman

Shri Anurag Sharma Member (Law)

Date of Order: June 12, 2025

1. The Commission in exercise of powers vested in it under Section 61(h), 86(1)(e) read with Section 181(2)(zd) of the Electricity Act, 2003, notified the UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) Regulations, 2023 (hereinafter referred to as "RE Regulations, 2023") on 16.08.2023 which came into force from the date of notification and shall remain in force for a period of 5 years from the date of commencement until and unless reviewed earlier or extended by the Commission.

2. Regulation 12 of the RE Regulations, 2023 specifies as under:

> ***"12. Control Period or Review Period***
>
> *The Control Period or Review Period under these Regulations shall be of five years, of which the first year shall be the financial year 2023-24.*
>
> *Provided that the benchmark capital cost of Solar PV, Canal Bank & Canal Top Solar PV, Solar Thermal, Municipal Solid Waste based power projects, Refuse Derived Fuel based power projects and Grid interactive Roof Top and Small Solar PV projects may be reviewed annually by the Commission.*
>
> *Provided further that the tariff determined as per these Regulations for the RE projects commissioned during the Control Period, shall continue to be applicable for the entire Tariff Period."*

3. The Commission vide Suo-moto Order dated 19.11.2024 had specified the benchmark capital cost and generic tariff for FY 2024-25 for Solar PV plants and Solar thermal Plants alongwith Grid Interactive Rooftop & Small Solar PV projects considering the fact that mostly such plants are of smaller capacity. The Commission had specified the benchmark capital cost and levellised tariff for solar energy-based power projects for FY 2024-25 which are as follows:

S. No.	Project	Benchmark Capital cost	Gross levellised tariff without subsidy	Levellised tariff with Accelerated Depreciation benefit.
1.	**Grid Interactive Rooftop & Small Solar PV Plants**			
	Slabs	**Rs./kW**	**Rs./kWh**	**Rs./kWh**
(a)	Upto 10 kW	43,063	6.08	5.84
(b)	>10 kW & upto 100 kW	39,507	5.52	5.30
(c)	>100 kW & upto 500 kW	37,271	5.14	4.94
(d)	>500 kW & upto 1 MW	36,185	4.93	4.73
		Rs. Lakh/MW	**Rs./kWh**	**Rs./kWh**
2.	Solar PV Plants	308.03	4.43	4.25
3.	Solar Thermal Plants	1,200.00	12.20	11.66

4. Having due consideration of the fact that with the passage of time and up-gradation of technologies in respect of the aforesaid solar projects, change in capital cost has been observed. Moreover, in discharge of the requirement of Regulation 12 of the RE Regulations, 2023, the Commission has decided to lay down the norm for the benchmark capital cost and generic tariff for the Solar PV, Solar Thermal Projects and Grid connected Rooftop & Small Solar PV projects to be commissioned during FY 2025-26 as elaborated in **Annexure-A** enclosed herewith.

5. Comments/suggestions of the stakeholders on the draft proposal are invited latest by **04.07.2025.**

(Anurag Sharma)
Member (Law)

(M.L. Prasad)
Chairman

A. Normative benchmark capital cost for Solar PV, Solar Thermal technologies and Grid Interactive Rooftop & Small Solar PV Plants to be commissioned during FY 2025-26

1. In accordance with Regulation 34, 36 & 37 of the RE Regulations, 2023 the normative capital cost for Solar PV, Solar Thermal and Grid Interactive Rooftop & Small Solar PV Plants is inclusive of all the capital works including plant and machinery, civil works, erection and commissioning, financing and interest during construction etc., and evacuation infrastructure upto the interconnection point.
2. Regulation 12 of the RE Regulations, 2023 specifies that the benchmark capital cost for Solar PV and Solar Thermal Power Plants and Grid Interactive Rooftop & Small Solar PV Plants may be reviewed annually by the Commission.
3. The proposed benchmark capital cost for the above referred solar technologies for FY 2025-26 and onwards are discussed below:

I. Solar PV Power Plants

4. With the increasing demand for power from highly diversified generation sources, there is rapid development in solar power sector in terms of investments, technology and innovations. The benign policies of the Central Government and the State Governments have made it possible for local, national and international players to participate in the Indian power markets. Such positive developments in Solar power market have resulted in healthy competition resulting in drastic reduction in the cost of solar power generation, thereby the end consumers of electricity stand to benefit by cheaper and environmentally friendly source of power generation.
5. As per Section 61 of the Electricity Act, 2003 (the Act), the appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff. Accordingly, taking cognizance of the potential of Solar Power Plant growth available in the State and in accordance with Section 61 of the Act, the Commission has followed the similar principles as had been considered in the previous Orders for determination of benchmark capital cost for solar energy based power plants.

Capital Cost & Generic Tariff

6. The Commission through Suo-moto Order dated 19.11.2024 had specified the benchmark capital cost of Rs. 308.03 Lakh/MW for Solar PV plants commissioned or likely to be commissioned in FY 2024-25. The Commission while specifying the benchmark capital cost for FY 2024-25 had considered module cost as 0.086 USD/Wp and exchange rate of Rs. 83.75/USD for determination of benchmark capital cost for FY 2024-25. Further, the Commission had considered a degradation of 0.50% on yearly basis, which was then applied to the module cost to arrive at yearly degradation cost, followed by discounting to arrive at the net present value of that degradation cost. Accordingly, considering the module cost, average exchange rate and annual degradation, the Commission had arrived at the module cost of Rs. 104.36 Lakh/MW for FY 2024-25.

The breakup of benchmark capital cost determined by the Commission for FY 2024-25 is as under:

Table 1: Benchmark Capital Cost of Solar PV Project

Sl. No.	**Particular**	**Capital cost Norm for Solar PV project (Rs. Lakh/MW)**
1	PV Modules	104.36
2	Land Cost	50.00
3	Civil and General works, Mounting Structures, Power Conditioning Unit, Cables and Transformers and Preliminary & Pre-operative expenses IDC, taxes etc.	153.68
	Total	**308.03**

7. The Commission has considered the following factors while determining the benchmark capital cost for FY 2025-26:-

   a) The Commission has considered the rates of Mono PERC Solar Modules to arrive at the benchmarked normative cost of modules.

   b) The Commission has considered the applicable GST and custom duty.

   c) Consumer Price Indexation and Wholesale Price Indexation to be applied.

   d) Degradation of the Solar Modules

   e) Escalating the cost of other civil & mounting works and equipment by average of last three years CPI and WPI.

8. The current average price of Modules is 0.068 USD/Watt and exchange is Rs. 85.68/USD. The Module cost has been determined after considering custom duty and degradation cost.

It is pertinent to mention that the CUF of 19% was fixed considering Poly Silicon Solar Module and Thin Film Solar Module. However, in the present Order, the Commission proposes to consider Mono PERC Solar Module which is an advance technology in comparison to Thin film Solar Module which must result into higher CUF reflecting higher generation from the said modules actually. However, the Commission as of now is not modifying the CUF stipulated in the regulations without analysing the actual CUF being achieved by such technology Solar plants. In this regard, the Commission has sought information regarding CUF of the solar power plants installed in the State of Uttarakhand from UPCL and the Commission shall take a view to amend the RE Regulations, 2023 to the extent of CUF, if required, based on the information provided by UPCL and generic tariff for solar energy based projects shall be re-determined to the extent of amended CUF, if any.

9. Further, the Commission has considered the spot prices which are generally on a higher side, and the developers will have the benefit of economies of scale on bulk purchases as well as it can enjoy the bulk purchase discount. Further, cost approved for FY 2024-25 pertaining to civil work, mounting structure and other equipment have been escalated with applicable CPI & WPI alongwith the applicable GST.

10. In light of the above discussions, the Commission proposes the capital cost of Rs. 290.64 Lakh/MW for Solar PV projects to be commissioned on or after 01.04.2025. Detailed breakup of the capital cost is as follows:

Table 2: Proposed Benchmark Capital Cost of Solar PV Project

S. No.	Particulars	Capital Cost (Rs. Lakh/MW)
1	PV Modules	83.81
2	Land Cost	40.00
3	Civil work mounting structure Power conditioning unit etc. and IDC/IEDC, taxes & contingency etc.	156.84
	Total Capital Cost	**280.64**

11. Based on the benchmark capital cost, as proposed above, the Commission has determined the gross generic tariff and net generic tariff after adjusting accelerated depreciation to be applicable for Solar PV plants to be commissioned in FY 2025-26 as follows:

Table 3: Proposed Generic Tariffs for Solar PV Plants

Particulars	Solar PV Plant (Rs./kWh)
Gross Tariff	4.29
Less: Acc Dep Benefit	0.17
Net Tariff	**4.12**

II. Solar Thermal Power Plants

12. The Commission proposes to adopt the benchmark Capital Cost as Rs. 1200.00 Lakh/MW for Solar Thermal Projects to be commissioned on or after 01.04.2025.

13. Based on the benchmark capital cost, as proposed above, the Commission has determined the gross generic tariff and net generic tariff after adjusting accelerated depreciation to be applicable for Solar Thermal plants to be commissioned in FY 2025-26 as follows:

Table 4: Proposed Generic Tariffs for Solar Thermal Plants

Particulars	Solar PV Plant (Rs./kWh)
Gross Tariff	12.48
Less: Acc Dep Benefit	0.52
Net Tariff	**11.95**

III. Grid Interactive Rooftop & Small Solar PV Plants

14. With regard to benchmark capital cost of Grid connected Rooftop & Small Solar PV projects under net metering, it is pertinent to mention that the main purpose of introducing net metering for Solar Rooftop plants was to promote renewable energy generation at the consumer level and encourage energy self-sufficiency, while enabling consumers to reduce their electricity bills and lower the demand of the distribution licensee. However, it is observed that with a passage of time, the consumers are installing Rooftop Solar Plants under net metering arrangement as an additional source of earning.

15. In the matter, it is a well-known fact that the solar energy is available during day-time generally from 7 AM to 6:30 PM and during this period solar prosumers export surplus energy to the grid at higher generic rates ranging from around Rs. 5 – Rs. 6/unit, whereas when the electricity is available to discom/UPCL at lower rates in power exchange ranging from Rs. 0.80/kWh to Rs. 2.50/kWh. By this way, the energy available at lesser rate, during day time, in exchange is adjusted with the energy sold by prosumers at higher generic rates is financially impacting the distribution licensee adversely. Further, during non-solar hours, UPCL/discom import electricity from the grid when the electricity rate in power exchange ranges from Rs. 10/kWh to Rs. 15/kWh for supplying to consumers including these solar prosumers. Recognizing this fact, Ministry of Power, GoI through its amendment to the Electricity (Rights of Consumers) Rules, 2020 has also required to allow rebate on consumption during solar hours and surcharge on consumption during non-solar hours as

the tariffs during the solar hours is less in comparison to the non-solar hours when thermal and hydro power is used to meet the demand.

16. Hence, the prime objective of promotion of net metering was to allow consumers to reduce their electricity bills by using solar power to offset their consumption and also support the grid by balancing power supply and demand. Thus, export to the grid by prosumers may be occasional when generation is more than their demand. Hence, to compensate them for the export of power to the grid, adjustment in consumption has been allowed during the billing cycle, and any excess will be paid by them to the discom or vice versa. The payment for surplus injection to the grid should ideally be related to the prevalent market prices as the calculation of tariffs with different subsidies available for installation of rooftop solar plants from Central/State Government is quiet cumbersome and complex to comprehend.

17. In the matter, the Commission has gone through the generic tariff approved by other State Commissions for grid interactive rooftop Solar PV plants installed under net metering arrangement. Details of the same are as follows:

Table 5: Generic Tariff of other SERCs

State Commission	Applicable Tariff
UPERC	Rs. 2.00/kWh
GERC	Rs. 2.76/kWh
MERC	Rs. 2.82/kWh

It is observed that UPERC has fixed an amount of Rs. 2.00/kWh for the surplus energy exported into the grid by the prosumer whereas in Maharashtra and Gujarat, the respective Commissions have considered the lowest quoted bid discovered through last tendering process.

18. It is observed that in the near past, no bids were invited by UREDA for development of solar power plants in Uttarakhand. Further, last time bids were invited by UREDA under *"Tariff Based Competitive Bidding Process Under Type-I Project of Uttarakhand Solar Energy Policy-2013"* in FY 2019-20 and it would not be prudent to consider the bids quoted in that tender as technical and financial parameters have changed a lot since FY 2019-20. Accordingly, the Commission proposes the generic tariff for the Solar PV plants to be installed under net metering arrangement equivalent to Rs. 2.00/kWh irrespective of the subsidy amount received by the prosumer.

The proposed tariffs as mentioned above at Tables shall be applicable on the projects

commissioned on or after 01.04.2025 and shall continue to be applicable till further reviewed by the Commission. Furthermore, the tariffs determined shall be the ceiling tariffs and procurement of power shall be done through competitive bidding route by the distribution licensee.