UTTARAKHAND ELECTRICITY REGULATORY COMMISSION

'Vidyut Niyamak Bhawan', Near I.S.B.T., P.O.-Majra, Dehradun-248171

Coram

Shri M. L. Prasad Chairman

Shri Anurag Sharma Member (Law)

Statement of Reasons for Draft UERC (Tariff and Other Terms for Supply of Electricity from Renewable Energy Sources and non-fossil fuel based Co-generating Stations) (Second Amendment) Regulations, 2025 (Principal Regulations, 2023).

Statement of Reasons

The Commission had issued 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 "Principal Regulations, 2023" or "RE Regulations, 2023") vide notification dated 16.08.2023. Subsequently, based on the various notification of Ministry of Power, Government of India (MoP, GoI) regarding revised trajectory of RPO to be met by the Obligated Entities and also based on the Electricity (Rights of Consumers) Rules, 2020, the Commission vide notification dated 20.06.2024 issued first amendment to RE Regulations, 2023.

The global energy sector is undergoing a significant transformation driven by the increasing penetration of renewable energy source such as solar and wind. These energy sources are inherently variable and intermittent, making it essential to have a system in place to ensure grid stability and reliability. Ministry of Power, GoI vide resolution dated 10.03.2022 has issued detailed guidelines for procurement and utilization of BESS as part of generation, transmission, or distribution assets, or along with ancillary services. Thereafter, MoP issued national framework for promoting energy storage system in August 2023.

UJVN Ltd. vide its letter dated 16.04.2025 submitted the proposal for its cost data and other performance norms prevalent in other States and requested the Commission for fixation of norms and setting of tariff/trading margin for proposed Battery Energy Storages System (BESS) in the State of Uttarakhand.

Further, it is also pertinent to mention that the Commission had determined the benchmark capital cost and ceiling/levelized tariff for Canal Bank SPV and Canal Top SPV through its RE Regulations, 2023 and over a period of time, there has been a rapid development in solar power sector in terms of investments, technology and innovations. Solar module cost which was USD 0.166/Wp during FY 2023-24 has drastically reduced to USD 0.066/Wp during FY 2025-26. Further, interest rates have also reduced in the last couple of years. Accordingly, the Commission has decided to review the benchmark capital cost and levelized tariff for Canal Bank SPV and Canal Top SPV.

Accordingly, the draft amendment covers the following:

A. Provisions regarding Battery Energy Storage System.

B. Review of Benchmark Capital Cost and levelized tariff of Canal Bank Solar PV Plants and Canal Top Solar PV Plant.

C. Provision for scheme-wise determination of generic tariff for solar energy based power plants.

A. Provisions regarding Battery Energy Storage System.

1. First proviso of sub-regulation (1) of Regulation 2 i.e. *'Scope and extent of application'* of Principal Regulations, 2023 specifies as follows:

   "*Provided that in cases of Wind, Small Hydro projects, Biomass power based on Rankine cycle, Non-Fossil Fuel based cogeneration projects, Solar PV, Canal Bank & Canal Top Solar PV projects, Solar Thermal power projects, Grid Interactive Roof Top and Small Solar PV plants, Biomass gasifier and Biogas, Municipal Solid Waste and Refuse Derived Fuel based power project these Regulations shall apply subject to the fulfilment of eligibility criteria specified in Regulation 4 of these Regulations.*"

Since norms for BESS plants are also proposed in the draft amendment, accordingly, the first proviso of sub-regulation (1) of Regulation 2 of Principal Regulations, 2023 is proposed to be read as follows:

"*Provided that in cases of Wind, Small Hydro projects, Biomass power based on Rankine cycle, Non-Fossil Fuel based cogeneration projects, Solar PV, Canal Bank & Canal Top Solar PV projects, Solar Thermal power projects, Grid Interactive Roof Top and Small Solar PV plants, Battery Energy Storage System, Biomass gasifier and Biogas, Municipal Solid Waste and Refuse Derived Fuel based power*

project these Regulations shall apply subject to the fulfilment of eligibility criteria specified in Regulation 4 of these Regulations."

Further, the following proviso is proposed to be inserted in Regulation 3(1) after the first proviso:

"*Provided further that the location and benefits to be derived from BESS projects should be clearly identified by the discom based on some scientific study and approval of the Commission shall be sought before issuance of the bids.*"

2. *S*ub-regulation (3) of Regulation 2 i.e. *'Scope and extent of application'* of Principal Regulations, 2023 specifies as follows:

"(3) The generic tariff specified for Wind, Solar PV and Solar Thermal power projects under these Regulations shall be the maximum tariff and the distribution licensee/UREDA shall invite tariff based competitive bids from generators/developers for procurement of power from these generators/developers. The distribution licensee shall enter into a PPA with the generators/developers bidding lower tariff."

Regulation 2(3) is proposed to be read as follows:

"(3) The generic tariff specified for Wind, Battery Energy Storage System, Solar PV and Solar Thermal power projects under these Regulations shall be the maximum tariff and the distribution licensee shall invite tariff based competitive bids from generators/developers for procurement of power from these generators/developers. The distribution licensee shall enter into a PPA with the generators/developers bidding lower tariff.

3. Replacement of 1st proviso of sub-regulation 3 of Regulation 2, i.e. *'Scope and extent of application'* of Principal Regulations, 2023:

The role of an intermediary agency has emerged in case of solar projects and their role is limited to the initial process of bidding and awarding the contract to the BESS or other solar developers, i.e. on behalf of the buying entity and also to monitor the performance of the projects. Practically, their role after the commissioning of the project is very minimal. Hence, considering the limited efforts and involvement in the project, the trading margin to be allowed to them should not be too excessive to burden the overall tariffs. Moreover, the BESS Bidding Guidelines dated 10th March 2022 notified by the MoP, GoI has fixed the trading margin @ 7 paise per unit as the ceiling rate. CERC has also capped the trading margin to 7

paise/unit. Accordingly, this Commission is also of the view that for BESS as well as other projects where Intermediary agency is in play, the trading margin should align with the market conditions. Hence, the Commission proposed to replace 1st proviso of 2(3) of the Principal Regulations, 2023 by the following:

"Provided that implementation of Canal Bank and Canal Top Solar Power Plants by the eligible government organisation shall be done through tariff based competitive bidding process. In such cases PPA for sale of power from these plants shall be signed with distribution licensee with the eligible Government organisation who shall get a margin of 4% of the tariff quoted by L-1 bidder towards their resources employed, however, the tariff plus a margin of 4% shall not exceed the generic tariff determined by the Commission for the year of commissioning.

Provided that in case of an Intermediary Agency, for implementation of Battery Energy Storage System for the discom, the trading margin shall be 5 paise per unit. The L-1 tariff plus a margin of 5 paise shall not exceed the generic tariff determined by the Commission for the year of commissioning."

4. Insertion of following proposed definition of *'Battery Energy Storage System'* after sub-regulation (1)(iii) of Regulation 3, i.e. *'Definitions'* of Principal Regulations, 2023:

"(iii)(a) "Battery Energy Storage System" or "BESS" means the system that shall utilize methods and the technologies such a electrochemical batteries (Lead Acid, Li-ion, solid state batteries, flow batteries, Nickel-cadmium etc.), providing a facility that can store chemical energy and deliver the stored energy in the form of electricity, including but not limited to ancillary facilities (grid support)."

5. Insertion of following proposed definition of *'Charge Ramp Rate'* and *'Cycle Efficiency of Energy Storage System'* after sub-regulation (1)(xiii) of Regulation 3 i.e. *'Definitions'* of Principal Regulations, 2023:

"(xiii)(a) "Charge Ramp Rate" means how quickly electric storage resources can transition from zero state of charge to full state of charge.

(xiii)(b) "Cycle/Round Trip Efficiency of Energy Storage System" means, the ratio of energy output to energy input over a complete charge and discharge cycle, expressed as a percentage.

*Cycle/Round Trip Efficiency ratio = (Energy Output/Energy Input)*100%"*

6. Sub-regulation (1)(xvi) of Regulations 3, i.e. *'Definitions'* of Principal Regulations, 2023 for

'Date of Commercial Operation for BESS':

The definition existing in Regulation 3(1)(xvi) is proposed to be replaced as follows:

*""**Date of commercial operation or Commissioning (CoD)"** in relation to a unit means the date declared by the generator on achieving maximum continuous rating through a successful trial run and in relation to the generating station, the date of commercial operation means the date of commercial operation of the last unit or block of generating station and expression 'commissioning' shall be construed accordingly.*

Provided that in case of Small Hydro Plants the date of commissioning shall not be linked to achieving maximum continuous rating, nevertheless the generator will have to demonstrate the same within three years of commissioning.

The date of commissioning of Solar PV plant shall be considered as the date of first injection of power into the licensee's grid after completion of the project in all respect subsequent to compliance of the following prerequisites, i.e.

(i) Installation of energy meter by the distribution licensee. The Distribution licensee shall install the meter within 7 days from the receipt of complete application;

(ii) Issuance of Clearance Certificate by the Electrical Inspector.

Provided that minimum 75% Performance Ratio based on the rated installed capacity in kW or MW is demonstrated within ten (10) days from the date of first injection of power into licensee's grid on compliance of aforesaid pre-requisites.

For a Battery Energy Storage System, COD shall mean the date declared by the project developer or the implementing agency, after successful commissioning and performance testing of the system, on which the BESS is capable of providing the contracted capacity as per the agreed technical parameters and subject to the following conditions:

(i) The system has been successfully commissioned and tested in accordance with applicable technical standards (such as CEA Grid Standard Regulations, IEEE/IEC standards, or utility-specific commissioning protocols) and issuance of Clearance Certificate by the Electrical Inspector;

(ii) Completion of all contractual obligations related to interconnection, grid synchronization, and metering. The Distribution licensee shall install the meter within 7 days from the receipt of complete application.

(iii) Demonstration of system performance for minimum duration as per the technical specification laid down by the distribution licensee. (e.g., charging-discharging cycle, response time, etc.)."

7. Insertion of following proposed definition of 'Discharge Ramp Rate' after sub-regulation (1)(xix) of Regulation 3, i.e. '*Definitions*' of Principal Regulations, 2023:

"(xix)(a) "Discharge Ramp Rate" means how quickly electric storage resources can transition from no output to full output, similar to the Ramp-up rate of conventional generators."

8. The following provision is proposed to be inserted after sub-regulation (1)(lxv)(vii) of Regulation 3 i.e. '*Definitions*' of Principal Regulations, 2023:

"(viii) Battery Energy Storage System- 12 years with an option for five years extension. However, for the extended period, the tariff shall be 50% of the original tariff."

9. The following clause is proposed to be inserted after sub-regulation 2(j) of Regulation 4 i.e. "*Eligibility Criteria for qualifying as Generating Station based on Non-Conventional/Renewable Energy Source*" of Principal Regulations, 2023:

"(k) Battery Energy Storage System – The project shall qualify to be termed as a Battery Energy Storage System as defined under Regulation 3(1)(iii)(a).

10. Existing first proviso of sub-regulation (2) of Regulation 11 i.e. '*Tariff*' of Principal Regulations, 2023 specifies as follows:

"Provided that the option of seeking project specific tariff shall not be available to the following:

(i) Any type of solar power plant;

(ii) Wind Energy Power Plants; and

(iii) Other RE based power projects having installed capacity upto 1 MW."

As per proposed amendment, the first proviso of sub-regulation (2) of Regulation 11 of Principal Regulations, 2023 shall be read as under:

"Provided that the option of seeking project specific tariff shall not be available to the following:

(i) Any type of solar power plant;

(ii) Wind Energy Power Plants;

(iii) Battery Energy Storage System; and

(iv) Other RE based power projects having installed capacity upto 1 MW."

11. Regulation 18 i.e. *'Depreciation'* of Principal Regulations, 2023

The existing sub-regulation 1(c) of Regulation 18 specifies as follows:

"(c) The depreciation rate for the first 15 years of the Tariff Period shall be 4.67% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 16th year onwards considering salvage value of the project as 10% of the project cost."

The same is proposed to be replaced by the following:

"(c) The depreciation rate for the first 15 years of the Tariff Period shall be 4.67% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 16th year onwards considering salvage value of the project as 10% of the project cost.

Provided that rate of 7.5% per annum shall be considered for the Useful life of the Battery Energy Storage System after adjusting salvage value of the project as 10% of the project cost."

12. Regulation 20(1), i.e. *'Interest on Working Capital'* of Principal Regulations, 2023

The existing Regulation specifies as follows:

"20. Interest on Working Capital

(1) The Working Capital requirement in respect of Wind energy projects, Small hydro power, Solar PV, Canal Bank and Canale Top Solar PV, Solar thermal and GRPV/GSPV power projects shall be computed in accordance with the following:"

The same is proposed to be replaced by the following:

"20. Interest on Working Capital

(1) The Working Capital requirement in respect of Wind energy projects, Small hydro power, Solar PV, Canal Bank and Canal Top Solar PV, BESS, Solar thermal and GRPV/GSPV power projects shall be computed in accordance with the following:"

13. Following Regulation is proposed to be inserted after Regulation 39. *"Municipal Solid Waste based Projects":*

*"**39.A Battery Energy Storage System***

1. *The technology specific parameters for determination of generic tariff for Battery Energy Storage System commissioned or to be commissioned on or after 01.04.2025 shall be as below:*

Capital Cost (Rs. Lakh/MWh)	***O&M expenses for year of commissioning***	***Normative Availability in a year***	***Degradation***
250	*1.25% of Capital cost for the first year and escalation of 5.25% per annum for the tariff period.*	*95%*	*2.5% p.a. for tariff period.*

2. *Annual Availability of BESS means the system availabilities all time blocks during the year in which Beneficiary has scheduled power for charging/discharging the BESS and the same will be calculated as below:*

   Availability in a time block = [Actual Injection or Drawl MUi (A)/Scheduled Injection or Drawal MUi (B)] X100

   i i refers to the ith time-block (15 minutes) in the year where MUi (B)≠ 0.

   ii MUi(A)= Agreed Despatch Schedule between Licensee or Beneficiary and BESS developers which shall be finally sent to SLDC for Charging/Discharging in the ith time block, in MUs

   iii MUi(B)= Despatch Schedule provided by Distribution Licensee or Beneficiary to BESS for Charging/Discharging in the ith time block, in MUs."

3. *Normative Depth of Discharge shall be 85%.*

4. *There will be preferably 2 number of cycles for complete charge and discharge cycles per day.*

5. *For optimal utilisation of BESS with respect to the cost and operational aspects of the BESS such as Cost of charging power, scheduling, discharge & discharge, location, system performance to be demonstrated for commissioning of the project etc., the distribution licensee in consultation with SDLC shall prepare a detail procedure and submit the same before the Commission for approval within 3 months of notification of these regulations."*

B. Review of Benchmark Capital Cost and levelized tariff of Canal Bank Solar PV Plants and Canal Top Solar PV Plant.

14. Exiting Table under Regulation 35 i.e. *'Canal bank Solar PV plants and Canal top Solar PV*

plants' of Principal Regulations, 2023 specifies as follows:

"

Type Solar PV Plant	*Capital Cost*	*O&M Expenses for year of commissioning*	*Capacity utilization Factor*
	(Rs. Lakh/MW)	*(Rs. Lakh/MW)*	
Canal Bank Solar PV Plant	*400.00*	*16.24*	*19%*
Canal Top Solar PV Plant	*425.00*		

"

15. The Commission had last reviewed the benchmark capital cost and levelized tariff for Canal Bank SPV and Canal Top SPV through its RE Regulations, 2023 during FY 2023-24. 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. 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.

16. Insertion of following proviso under Regulation 53, i.e. 'Power to Remove Difficulties' of the Principal Regulations, 2023.

BESS technology is the emerging technology in the power sector and the Government is issuing policies/guidelines from time to time for implementation of BESS projects. Further, technological changes are also occurring rapidly with the usage. Accordingly, it is imperative to align the Regulations in light of the changes occurring in the sector. Hence, the following proviso is proposed to be inserted in the Principal Regulations:

> "*Provided that for BESS projects, for the purpose of adaption and removal of any discrepancy, difficulty in implementation or requiring any clarification due to or giving effect to the Government policies issued from time to time, technological changes in the BESS technologies or any such related reasons, the Commission may also by Order provide for the same*".

17. During FY 2023-24, while finalising the benchmark capital cost and levelised tariff for solar energy based power plant, the module cost was USD 0.166/Wp which has significantly reduced to USD 0.066/Wp in FY 2025-26. Moreover, interest rates have also changed in the last couple of years. Accordingly, the Commission proposes amendment in Table under

Regulation 34 as follows:

"

Type Solar PV Plant	*Capital Cost*	*O&M Expenses for year of commissioning*	*Capacity utilization Factor*
	(Rs. Lakh/ MW)	*(Rs. Lakh/MW)*	
Canal Bank Solar PV Plant	*322.00*	*16.24*	*19%*
Canal Top Solar PV Plant	*343.00*		

"

18. Based on the applicable financial norms in accordance with the provisions of RE Regulations, 2023 as amended from time to time, Table -7 i.e. *'Levelised rate of Fixed Charges (RFC) for Canal Bank Solar PV and Canal Top Solar PV Power Projects:'* of the Annexure-I is proposed to be replaced with following:

"

Particular	*Canal bank Solar PV Power Plants*	*Canal top Solar PV Power Plants*
	(Rs./kWh)	
Gross Tariff	*4.50*	*4.68*
Less: Acc. Dep. Benefit	*0.19*	*0.20*
Net Tariff	*4.31*	*4.48*

"

C. Provision for scheme-wise determination of generic tariff for solar energy based power plants.

19. The following provision is proposed to be inserted after first proviso of Regulation 12(1), i.e. *'Control Period or Review Period'* of Principal Regulations, 2023:

"Nothwithstanding anything to the contrary, the Commission, as and when required and to the extent deemed sufficient by it, may also determine separate benchmark capital cost and levelized tariff for the renewable energy based power projects based on the schemes of Central/State Government."

By the order of the Commission

(Neeraj Sati)
Secretary