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(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)



[formerly Power System Operation Corporation Limited (POSOCO)]
राष्ट्रीय भार प्रेषण केन्द्र / **National Load Despatch Centre**

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Ref: GRID-INDIA/NLDC/CERC/

Date: 15th March 2024

सेवा में,

सचिव,

केन्द्रीय विद्युत विनियामक आयोग

3rd एवं 4th फ्लोर, चंद्रलोक बिल्डिंग

36, जनपथ, नयी दिल्ली, 110001

विषय: Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024– suggestions thereof.

महोदय/ महोदया,

The suggestions on behalf of Regional Load Despatch Centres(RLDCs) and National Load Despatch Centre(NLDC) on Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 are enclosed herewith for kind perusal.

Delay in submission of the suggestions may be condoned.

सधन्यवाद,

भवदीय,

(एस. सी. सक्सेना)

कार्यपालक-निदेशक-रा०भा०प्रे०के०

Encl: As above

Copy for kind information:

1. CMD, Grid-India
2. Director (MO), Director (SO), Grid-India
3. All RLDC Heads



**Grid Controller of India Limited
(A Govt. of India Enterprise)
(Formerly Power System Operation Corporation Limited)**

The suggestions on behalf of Regional Load Despatch Centres(RLDCs) and National Load Despatch Centre(NLDC) on Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024

The suggestions are summarized below -

1. Inter-connection point for Hybrid RE Projects:

Provision in Draft Regulation:

2.1.z.aa) 'Renewable hybrid energy project' means a renewable energy project that produces electricity from a combination of renewable energy sources connected at the same inter-connection point;

Suggestion:

The clause 3 of MoP Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Wind Solar Hybrid Projects dated 21st August 2023 states that:

Quote-

3. APPLICABILITY OF GUIDELINES

3.1. These Guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for long-term procurement of electricity through competitive bidding process, by Procurer(s), from Hybrid Power Projects having (a) bid capacity of 10 MW and above for projects connected to intra-state transmission system; and (b) bid capacity of 50 MW and above for projects connected to inter-state transmission system, subject to the condition that the rated power capacity of one resource (wind or solar) shall be at least 33% of the total contracted capacity.

3.2. The solar and wind projects of the hybrid project may be located at same or different locations.

Unquote

Accordingly, for harmonization of definition of Renewable hybrid energy project, combination of renewable energy sources connected at the same inter-connection or different locations may be considered.

Source:

(<https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/10/2023100555435315.pdf>)

2. Bringing Battery Energy Storage System (BESS) under the scope of the regulation:

Provision in Draft Regulation:

3. Scope and extent of application

These regulations shall apply to cases where the tariff, for a grid connected generating station or a unit thereof commissioned during the Control Period and based on renewable energy sources is to be determined by the Commission under Section 62 read with Section 79 of the Act:

*Provided that in cases of wind power projects, small hydro projects, biomass power projects with Rankine cycle technology, non-fossil fuel based co-generation projects, solar PV power projects, floating solar projects, solar thermal power projects, renewable hybrid energy projects, **renewable energy with storage projects**, biomass gasifier based power projects, biogas based power projects, municipal solid waste based power projects, and refuse derived fuel based power projects, these regulations shall apply subject to the fulfilment of eligibility criteria specified in Regulation 4 of these Regulations.*

Suggestion –

National Framework for Promoting Energy Storage Systems ([National Framework for promoting Energy Storage Systems August 2023.pdf \(powermin.gov.in\)](#)) and Guidelines for Procurement and Utilization of Battery Energy Storage Systems as part of Generation, Transmission and Distribution assets, along with Ancillary Services ([BESS.pdf \(powermin.gov.in\)](#)) suggests tariff determination and consequent adoption under competitive bidding route.

Quote –

National Framework for Promoting Energy Storage Systems -

6.4. Technology Agnostic Bidding Guidelines for procurement of ESS

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6.4.4. *The bidding may be on the basis of either composite tariff (including the cost of input power) in case input power is arranged by the developer or tariff for storage on a per Megawatt Hour basis if the input power is to be arranged by the procurer of the storage capacity. The appropriate Commission shall adopt the above tariff u/s 63 of the Electricity Act, 2003.*

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Guidelines for Procurement and Utilization of Battery Energy Storage Systems as part of Generation, Transmission and Distribution assets, along with Ancillary Services

1. *Applicability of Guidelines These Guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for procurement of energy from BESS by the ‘Procurers’, through competitive bidding, from gridconnected Projects to be set up on “Build-Own-Operate” or “Build-Own-Operate-Transfer” basis, with following minimum project size and bid capacity requirements:*

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Unquote.

However, as per Draft RE Tariff Regulation, the renewable energy with storage projects (both BESS and PSP) is envisaged under Section 62 route. Clarity may be provided over the treatment of hybrid projects where storage part is under competitive bid route while rest of the RE parts under Section 62 route.

3. Calculation of capacity utilization factor and plant load factor:

Provision in Draft Regulation:

The number of hours in a year for calculation of the capacity utilization factor and plant load factor, as the case may be, shall be considered as 8766.

Suggestion –

MoP vide its latest Guidelines for Tariff Based Competitive Bidding Process for Procurement of Power from Grid Connected Wind Solar Hybrid Projects and Guidelines for Tariff Based Competitive Bidding Process for Procurement of Firm and Dispatchable Power (FDRE) from Grid Connected Renewable Energy Power Projects with Energy Storage Systems (<https://cdnbbsr.s3waas.gov.in/s3716e1b8c6cd17b771da77391355749f3/uploads/2023/10/20231005280539825.pdf>) has placed a threshold of 175 hrs (for solar & FDRE power) and 50 hrs (for wind and wind-solar hybrid power) as the duration of unavailability. As per the guidelines, Generation Compensation is to be provided for lesser offtake beyond the stipulated hours in a year/contract year, as defined in the PPA.

The relevant clauses for Grid Connected Wind Solar Hybrid Projects is tabled below –

Duration of Grid unavailability	Provision for Generation Compensation
<i>Grid unavailability in a contract year as beyond 50 hours in a Contract Year as defined in the PPA:</i>	<i>Generation Compensation = (Tariff X RE power (MW) offered but not scheduled by Procurer) X 1000X No. of hours of grid unavailability. However, in the case of third-party sale or sale in the power exchange, as price taker, the 95% of the amount realized, after deducting expenses, shall be adjusted against the Generation compensation payable, on monthly basis.</i>

The relevant clauses for Dispatchable Power (FDRE) from Grid Connected Renewable Energy Power Projects with Energy Storage Systems is –

Duration of Grid unavailability	Provision for Generation Compensation
<i>Grid unavailability beyond 175 hours in a year, as defined in the PPA</i>	<i>Generation Compensation = (Tariff X RE power (MW) offered but not scheduled by Procurer) X 1000X No. of hours of grid unavailability However, in case of third-party sale or sale in the power exchange, as price taker, the 95% of the amount realised, after deducting expenses, shall be adjusted against the Generation compensation payable, on monthly basis.</i>

The proposed 175 hours actually turns out to be 2% $[175 / (365 * 24)]$ of annual RE curtailment in energy terms.

Hence, the outage hours (outage on account of grid unavailability, planned outage, force majeure) may be suitably be included in the regulation for calculation of capacity utilization factor and plant load factor.

4. Statutory Charges:

Provision in Draft Regulation:

23 Statutory Charges

*The renewable energy project developer shall recover from the beneficiaries the statutory charges imposed by the State and Central Government, such as **water cess**, and electricity duty on auxiliary consumption, subject to the maximum of normative auxiliary consumption.*

Suggestion –

Recently the Hon'ble High Court of Himachal Pradesh NHPC Ltd. Vs. State of Himachal Pradesh through its Secretary & Ors. [Civil Appeal No. 3948 of 2009] (https://www.livelaw.in/pdf_upload/nhpc-ltd-527759.pdf) has declared **the water cess levied by the state government on hydropower generation as unconstitutional**. Consequently, the Himachal Pradesh Water Cess on Hydropower Electricity Generation Rules 2023, have been quashed and set aside by the Hon'ble High Court. Accordingly, the proposed provision in the regulation may be suitably amended.

5. Capacity Utilisation Factor for solar PV power projects, solar thermal power projects and floating solar projects:

Provision in Draft Regulation:

47.Capacity Utilisation Factor

The Commission shall only approve capacity utilisation factors for project specific tariffs:

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Suggestion –

CERC may outline the modalities through which CUF may be fixed at the time of determination of tariff in the regulation.

6. BESS Storage Efficiency

Provision in Draft Regulation

72.Storage Efficiency

(1) The Commission shall approve the storage efficiency only for project specific tariffs:

Provided that the minimum efficiency for storage based on the technology of solid state batteries shall be 80%.

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Suggestion –

Battery Energy Storage Systems (BESS) pilot project of capacity 500 MW/1000 MWh (2 hours storage) at 400/220 kV Fatehgarh-III (Rajasthan) Sub-Station has been finalized through competitive bidding by

SECI. In the Request for Selection (RfS) of the project minimum storage efficiency (RtE) has been benchmarked at 85%.

(Source: <https://www.seci.co.in/Upload/Tender/SECI000069-8118735-RfSESS-1-finalupload.pdf>)

Quote -

8 Performance Criteria of the Project

8.1 Project performance parameters

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iii. The BESSD shall guarantee AC to AC roundtrip efficiency (RtE) of system on monthly basis. The BESSD shall be liable for Liquidated Damages to the offtaker, if any, on account of excess conversion losses, based on the following conditions:

*(a) For $RtE < 85\%$, there shall be a liquidated damage levied @ Rs. 2 per unit of excess conversion losses **considering system RtE = 85%***

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Unquote.

Similarly, Request for Selection (RfS) Document for setting up of Pilot Projects of 250 MW/500 MWh Standalone Battery Energy Storage Systems in Gujarat under Tariff-Based Global Competitive Bidding (Phase-I) has outlined project minimum storage efficiency (RtE) as 85%.

(Source: https://www.guvnl.com/notice/UPLOAD/10082022_599GUVNL/599_GUVNL_22_57_25_doc1_Rfs-Bespa.pdf)

Quote -

9. Performance Criteria of the Project

9.1 Project performance parameters

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3. The BESSD shall guarantee AC to AC roundtrip efficiency (RtE) of system on monthly basis. The BESSD shall be liable for Liquidated Damages to the offtaker, if any, on account of excess conversion losses, based on the following conditions:

(a) For $RtE < 70\%$, there shall be a liquidated damage @ APPC tariff of previous financial year of the Discoms of excess conversion losses considering system $RtE = 85\%$ and tariff payment for the corresponding month shall not be made to the BESSD;

*(b) For $70\% \leq RtE < 85\%$, there shall be a liquidated damage levied @ APPC tariff of previous financial year of the Discoms of excess conversion losses **considering system $RtE = 85\%$** ;*

(c) For $RtE > 85\%$, there shall be incentive @Rs. 0.50 per unit of excess discharge of energy considering system $RtE = 85\%$.

Unquote.

Hence, a higher benchmark keeping in view of the BESS developed under competitive bidding for storage efficiency for solid state batteries may be considered.

7. Additional Suggestions –

Grid-India in its recently published report titled – “**Report on Events Involving Transmission Grid Connected Wind & Solar Power Plants**” (<https://posoco.in/wp-content/uploads/2023/12/Report-on-Events-Involving-Transmission-Grid-Connected-Wind-Solar-Plants.pdf>), has analysed grid events related to frequent loss of Renewable Energy (RE) generation during last year in India. A total of 31 grid events involving generation loss in the range of 1000-7000 MW in individual events have occurred during the period January 2022 to May 2023 in Inter State Transmission System (ISTS) connected RE pockets. The grid disturbances involving loss of 6-7 GW have been observed in the Rajasthan RE complexes as a consequence of **non-compliance during Low Voltage Ride Through (LVRT) and/or High Voltage Ride Through (HVRT) events**. A summary of RE generation dip events (more than 1000MW) may be found in Annexure. Such events are not only a threat to grid security. They also enhance the requirement of the fast ramping generation reserves to be maintained in the grid.

Further, non-compliance (related to reactive VAR support, active power support during low voltage scenarios) to CEA (Technical Standards for Connectivity to the Grid) Regulation has been observed on the part of multiple RE generators across India.

In the light of the above it is suggested that, Return on Equity (RoE) may be suitably deducted (say 1%) for persistent non-compliance of CEA Grid Standards.
