सत्यमेव जयते
Government of India
Ministry of Power
Central Electricity Authority
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18th February, 2025

To,

I. **Principal Secretaries/Secretary (Power/Energy) of all State Governments/ UTs**
II. **CMDs, Central Generating Stations**
III. **Head, REIAs**

Subject: Advisory on co-locating Energy Storage Systems with Solar Power Projects to enhance grid stability and cost efficiency reg.

Sir/Madam,

As you may be aware, India has set itself an ambitious target of increasing the non-fossil fuel capacity of the country to 500 GW by 2030. To achieve this goal, the capacity of variable renewable energy sources such as solar and wind needs to be enhanced significantly. This can pose significant challenges to grid stability, as these VRE sources are intermittent and variable in nature and may not be available for generation during periods of low RE or high demand.

2. In this context, energy storage systems (ESS) would be essential to ensure grid stability, reliability, and optimal energy utilization. ESS can help address the intermittency challenges of RE projects, by storing excess energy for use during low RE hours, thus ensuring a more reliable and stable grid.

3. The current installed capacity of ESS as on 31.12.2024 is 4.86 GW which includes 4.75 GW of PSP and 0.11 GW of BESS projects. As per the National Electricity Plan published by the Central Electricity Authority, in order to integrate the 364 GW of solar and 121 GW of wind capacity by 2031-32, India would require 73.93 GW/411.4 GWh of storage capacity (26.69 GW/175.18 GWh from PSP and 47.24 GW/236.22 GWh from BESS).

4. In order to achieve this target, all Renewable Energy Implementing Agencies (REIAs) and State utilities are advised to incorporate a minimum of 2-hour co-located Energy Storage Systems (ESS), equivalent to 10% of the installed solar project capacity, in future solar tenders. This requirement will help mitigate intermittency issues and provide critical support during peak

demand periods. A suitable compliance mechanism may also be explicitly mentioned in the bid document to ensure the availability of storage during non-solar hours.

5. Distribution licensees may also consider mandating 2-hour storage with roof top solar plants as well. This will improve reliability of supply at the consumer end and distribution licensees will also feel the relief from over-injection during solar hours.

6. By implementing the proposed storage clause, approximately 14 GW/28 GWh of storage can be installed by 2030. The recent decrease in battery prices may also help reduce the power purchase costs during evening hours when solar generation is unavailable and energy rates in the exchange are high.

7. The storage system can be run either in single-cycle operation where it is charged using the co-located solar power and discharged during evening hours, or in double cycle operation, where in addition to solar power, it can also be charged using energy from the grid during low demand hours and discharged during peak hours (especially non solar hours).

8. The integration of storage systems with solar power projects would not only support grid stability but also provide long-term economic benefits, such as improving the evening time utilization of transmission lines constructed for evacuating solar power, thereby reducing transmission requirement and charges, improving energy security, and enhancing the overall efficiency of renewable energy systems.

This issues with the approval of competent authority.

18/02/2025

Rakesh Kumar
Secretary

Copy to:

1. Secretary, Ministry of Power, New Delhi
2. Secretary, Ministry of Renewable Energy
3. Secretary, CERC