

Rajasthan Electricity Regulatory Commission _____

Suggestions on Petition by RUVNL Seeking Approval of Procurement of 1200 MW Solar and Energy Storage Hybrid System and Approval of Deviation from MNRE Guidelines

Nov 2022 _____



Rajasthan Urja Vikas Nigam Limited (“RUVNL”) filed a petition for approval of deviations from the Ministry of Power’s guidelines for tariff-based competitive bidding (“TBCB”) process for procurement of power from grid-connected wind/solar hybrid projects with an option to add storage (“MoP guidelines”) for long-term procurement (25 years) of 1200 MW power from solar power projects with committed power supply from energy storage systems for minimum 6 hours in peak demand periods between 6 am-10 am and 6 am-10 pm from FY 2025-26 (“planned power procurement”).

The following comments are submitted by CEEP in this regard.

1. Comments Against the Prayers of the Petitioner

- a. The petitioner plans for a committed supply of 6 hours from the energy storage system during the peak demand periods of 6.00 am to 10.00 am and 6.00 pm to 10.00 pm. However, it is not clear if the petitioner is seeking 1200 MW of supply from the energy storage system or the hybrid system. Based on the peak demand periods indicated, it seems to be the latter since solar PV systems shall not be able to supply the stated power during the evening peak demand period.
- b. It is our concern that the petitioner is vague in its plan, especially its demand for energy storage systems. The SECI guidelines referred to by the petitioner suggest ESS of a minimum 1 MWh capacity for every MW of contracted capacity. The petitioner’s guidelines shall lead to controversy during bidding because of various possible interpretations of the guidelines. Further, it may also lead to over-sizing of the solar PV and ESS system, and under-utilisation of the hybrid system and the evacuation infrastructure.
- c. It may also be noted that, on an annual average basis, in a day, a solar PV system operates for about 4.8 hours of equivalent rated capacity. In a solar PV and ESS hybrid system, in a scenario where the ratio of PV capacity to ESS capacity (in MW) is less than or equal to 1, complete charging of ESS through solar PV shall not be technically feasible. Hence, provision for external injection and trading of power shall be required to be inserted.
- d. The proposed trading margin of 7 paise per kWh for the intermediary is very high, and the Commission may allow for a prudent trading margin only. In case there is no intermediary, the clauses on intermediary and trading margin shall be removed.
- e. Achieving a minimum CUF of 30% for Solar and ESS hybrid systems against the contracted capacity on the AC side is not feasible without significantly over-sizing the system on the DC size. The approach is non-optimal as it shall lead to over-injection and underutilisation of the transmission network.

- f. Consequently, if the guidelines are retained, the petitioner needs to seek amendment of performance values also.

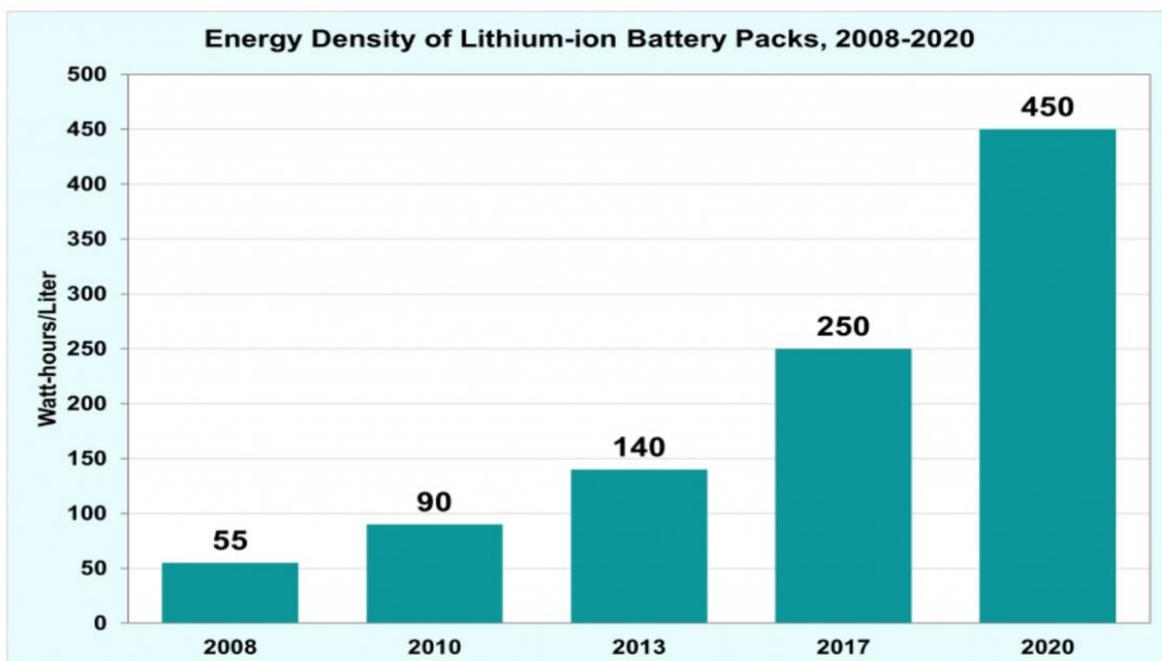
2. Validity of EAC Estimations

While we do not object to the procurement plan for 1200 MW of solar PV and ESS hybrid capacity, we request the Commission to reject the demand forecast of the Electricity Assessment Committee. EAC’s approach to energy demand estimations is very rudimentary and may have significant shortfalls given the increasingly dynamic nature of electricity demand. The Commission may give directions to undertake exhaustive medium- and long-term demand forecasting exercises in consultation with experts and public stakeholders. This shall protect the consumers and investors against the risk of overestimation or underestimation of demand.

3. Suggestions By CEEP

There is continuous improvement and innovation in the domain of energy storage systems (Figure 1). Market prices of energy storage systems have also been falling. Given the industry landscape of energy storage, it makes less business sense to enter into a 25-years contract.

Figure 1: Volumetric energy density of lithium-ion batteries increased by more than eight times between 2008 and 2020; Office of Energy Efficiency and Renewable Energy, US Department of Energy



Further, energy storage is a flexible asset and can potentially create more value if it is not treated as a committed supply source. Hence, the petitioner's plan for procurement of

committed supply during peak demand hours limits the value of the energy storage system. We suggest that the energy storage system is treated as a flexible resource in the bid document.

For the aforementioned purpose, it shall be prudent to arrange separate procurement of solar PV capacity and energy storage capacity, although joint bids may be invited for the same. This shall also allow the systems to be integrated and synchronised with a singular point of coupling.

Hence, the following guidelines may be adopted for the aforementioned purpose:

1. Guidelines for procurement of power from grid-connected solar energy projects
2. Guidelines for procurement and utilisation of battery energy storage systems as part of generation, transmission, and distribution assets along with ancillary service