ICRA

Indian Renewable Energy Sector

Declining battery costs a positive for tariff competitiveness of BESS projects

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Highlights

Highlights

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Battery prices have declined to an all-time low in 2023 led by the decline in raw material prices amid the increase in production across the value chain.

This is also reflected in the significant decline in tariff for BESS projects in the latest tender by Gujarat utilities. A sustained decline in battery prices remains the key to greater adoption of BESS projects.

- The rise in the renewable energy (RE) capacity over the ongoing decade is estimated to increase the share of RE power, including large hydro, to 40% of the all-India electricity generation by FY2030. Achieving such a high level of RE share would require development of energy storage systems (ESS) to manage the intermittency associated with wind and solar power. The ESS is currently mainly driven by Battery Energy Storage Systems (BESS) and Pumped Hydro Storage Projects (PSP).
- The decline in battery costs over the past decade leading up to CY2021 helped reduce the cost of energy storage and adoption of BESS projects globally. While the prices went up in CY2022, they declined in CY2023 to an all-time low, led by the moderation in raw material prices amid the increase in production across the value chain. Cheaper battery prices remain the key to increased adoption of BESS projects, in ICRA's view.
- Post the notification of the bidding guidelines by the Ministry of Power for BESS projects, there have been multiple bids called by Central nodal agencies and state distribution utilities. A first such bid was by the Solar Energy Corporation of India Limited (SECI) in 2022 and the latest bid was by Gujarat State Utilities in 2024. The discovered tariff under the BESS tenders declined from Rs. 10.84 lakh/MW/month in the first SECI tender to Rs. 4.49 lakh/MW/month in the latest tender by Gujarat, reflecting the decline in battery prices and improving competitiveness of BESS projects.
- The tariff under the bids called by the SECI and Gujarat Utilities are fixed and payable based on availability, with a contract tenure of 12 years. The developer is required to achieve 95% annual availability and 85% round trip efficiency for full recovery of the tariff. The viability of the BESS projects remains pegged to the capital cost of the BESS. The viability for the winning bidders under the latest tender by Gujarat Utilities would remain linked with the decline in battery prices from the levels seen in 2023.
- Based on prevailing battery costs, the storage cost using BESS is estimated to be relatively high in the range of Rs. 6.0-7.0 per unit against Rs. 5.0 per unit in case of PSP hydro. Nonetheless, this has come down from the level of over Rs. 8.0-9.0 per unit seen in 2022. While the cost of storage remains relatively high for BESS compared to PSP, the execution risks and gestation period for the BESS projects remain relatively low compared to PSP hydro. However, BESS projects have a relatively shorter life span and require replacement capex. Overall, a sustained reduction in battery prices and relatively low gestation period for the BESS projects is expected to support their greater adoption for energy storage, going forward.

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Thank You!