



# Indian Renewable Energy Sector

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**INR 1.4 trillion needed to scale up BESS capacity - a must for RE grid integration**

**December 2025**



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## Highlights

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*Energy storage deployment will be led by BESS and pumped hydro, with BESS alone requiring an estimated Rs. 1.4 trillion investment by 2030*

*Global battery price decline along with VGF support from the government have made BESS increasingly cost-competitive, driving momentum in standalone storage and solar-plus-storage tenders and lowering tariffs significantly*



- **The renewable energy (RE) capacity in India is projected to rise significantly over the current decade**, increasing the share of RE power—including large hydro—to about 40% of total electricity generation by FY2030. Achieving this ambitious target will require robust energy storage systems (ESS) to address the intermittency of wind and solar power. At present, ESS deployment is primarily driven by Battery Energy Storage Systems (BESS) and Pumped Storage Hydropower (PSP) Projects. ICRA expects the energy storage sector to require an investment of around Rs. 1.4 trillion for BESS capacity addition by 2030, reflecting the scale of opportunity and commitment needed to support renewable integration.



- **Over the past decade, global battery pack prices have fallen to record lows, making battery energy storage systems (BESS) far more cost-effective** and driving down tariffs for standalone storage as well as solar-plus-storage projects. Additionally, the government support through Viability Gap Funding (VGF) scheme for a cumulative capacity of 30 GWh and government's mandate for new solar projects to include at least 10% storage capacity has resulted in competitive tariffs to gain momentum in this space. This is further supported by the growing need for grid stability and peak load management as renewable penetration rises, positioning BESS as one of the key elements in India's clean energy transition.



- **Based on prevailing battery costs, the levelised storage cost using BESS for 2 hours to 4 hours of storage is estimated to be relatively high in the range of Rs. 4.0-7.0 per unit against Rs. 5.0 per unit in case of PSP projects.** Nonetheless, this has reduced from the level of over Rs. 8.0-9.0 per unit seen in 2022. While storage cost remains high for BESS for 4-hour storage compared to PSP, the execution risks and gestation period for the BESS projects remain relatively low compared to PSP projects. 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 in overall energy storage mix, going forward.



- **Key risks for BESS implementation in India include a limited track record of successful execution, minimal domestic manufacturing capacity, and a shortage of large-scale EPC players. These factors increase dependence on overseas vendors, thereby amplifying execution risks.** Furthermore, heavy reliance on imported lithium-ion components exposes projects to supply chain disruptions and potential cost escalations. In addition, during the operational phase, challenges could arise in meeting stringent performance benchmarks, strict penalties for delays or underperformance, and the need for specialised experts during on-ground operations.



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