

INDIAN RENEWABLE ENERGY SECTOR

**PSP capacity addition of 10-12 GW
likely by 2030; execution challenges
remain the key constraint**

MARCH 2025



1 Highlights



2 Trends in Renewable Energy Sector



3 Overview of Hydro Power and PSP Capacity in India



4 Capital Cost and Tariff Trends for Large Hydro



5 Bidding Trends and Viability Assessment for PSP projects



6 BESS vs PSP





Highlights



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Integration of the growing share of renewables with the grid necessitates large investments in energy storage projects.

PSP projects witnessed a decline in bid tariffs over the past six months, improving their competitiveness and their adoption by the state utilities.



- The renewable energy (RE) capacity in the country, including large hydro, witnessed a strong growth over the past decade led by the strong policy support and tariff competitiveness of solar and wind power. The share of RE constituted 45.5% of India's power generating capacity as of January 2025 as compared to 21% in FY2024. This growth is expected to continue, with India's RE share increasing to 59% in installed capacity and over 35% in electricity generation by FY2030.



- Achieving high level of RE share in electricity generation would require development of energy storage systems (ESS) to manage the intermittency associated with wind and solar power. ESS also play a role in improving grid stability, providing ancillary support services and peak load shifting, among others. ICRA estimates India's energy storage capacity need to stand at 50 GW by 2030 with 5-6 hours of storage, to be met through a mix of battery energy storage systems (BESS) and pumped storage hydropower (PSP) projects.



- The Government of India estimates PSP potential in the country to be 183 GW. Of this, 8 GW is under construction, 4 GW is approved for development and 63 GW is under survey and investigation. The under-construction capacity of 8 GW does not consider the recent PSP projects awarded through the bidding route by the state distribution utilities in Maharashtra and Uttar Pradesh.



- The PSP projects under development in the country stand at ~17 GW, as of February 2025, as per ICRA, with commissioning timeline by 2030, including the recently awarded projects through the bidding route. However, given the execution challenges associated with these projects owing to the complexity in construction and delays in securing approvals, some of these projects are likely to be deferred to beyond 2030. In this context, ICRA estimates a PSP capacity addition of 10-12 GW by 2030.



- The state distribution utilities of Karnataka, Maharashtra and Uttar Pradesh have called for bids to award PSP projects, with aggregate bid capacity of 5.25 GW and storage of 42 GWH. The discovered bid tariff (annual fixed charge) declined from Rs. 1.48 crore/MW/annum in 2023 to Rs. 0.84 crore/MW/annum in 2024 and further to Rs. 0.77 crore/MW/annum in February 2025, driven by rising competition. This sharp decline in bid tariffs has led to a moderation in storage tariffs to less than Rs. 4.0 per unit from Rs. 6.5 per unit. The viability of these bid tariffs remains linked with the capital cost of the projects and achievement of cycle loss of 25% or lower.



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Analytical Contact Details

Name	Designation	Email	Contact Number
Girishkumar Kadam	Senior Vice-President & Group Head	girishkumar@icraindia.com	022 – 6169 3441
Vikram V	Vice-President & Co-Group Head	vikram.v@icraindia.com	040 – 6939 6410
Ritabrata Ghosh	Vice-President	ritabrata.ghosh@icraindia.com	033 – 6521 6813
Asmita Pant	Assistant Vice President	asmita.pant@icraindia.com	0124 – 4545 846





ICRA

Business Development/Media Contact Details

Name	Designation	Email	Contact Number
L Shivakumar	Chief Business Officer	shivakumar@icraindia.com	022-61693304
Neha Agarwal	Head – Research Sales	neha.agarwal@icraindia.com	022-61693338
Rohit Gupta	Head Business Development – Infrastructure Sector	rohitg@icraindia.com	0124-4545340
Vivek Bhalla	Head Business Development – Financial Sector	vivek.bhalla@icraindia.com	022-61693372
Vinita Baid	Head Business Development – Corporate Sector - West & East	vinita.baid@icraindia.com	033-71501131
Shivam Bhatia	Head Business Development – Corporate Sector - North & South	shivam.bhatia@icraindia.com	0124-4545803
Naznin Prodhani	Head – Group Corporate Communications & Media Relations	communications@icraindia.com	0124-4545860





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