ICRA

Indian Renewable Energy Sector

RE capacity addition reaches all-time high in FY2025; growing impetus on energy storage capacity to enable grid integration of renewables

MARCH 2025

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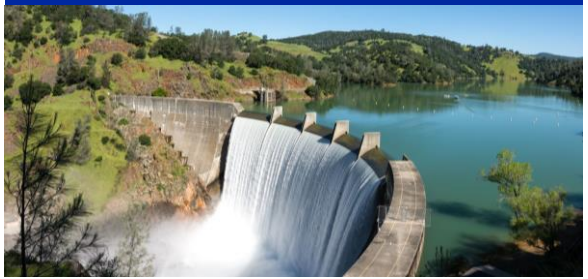

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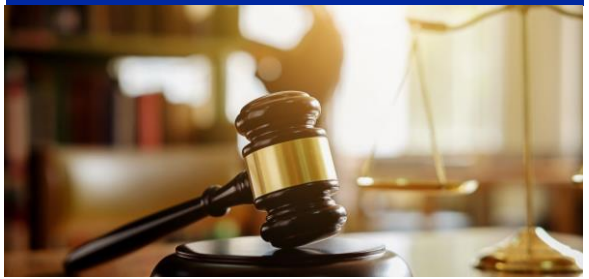

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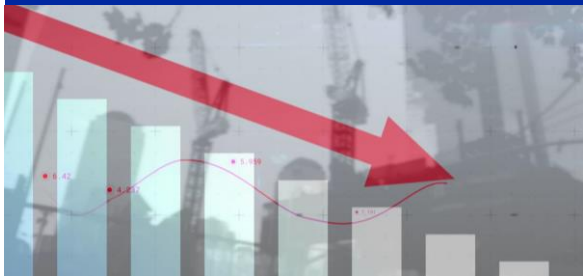

12 Rating Trends in Renewable Energy Sector

Highlights

Highlights – I

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RE capacity addition improved to 24.1 GW in 11M FY2025 from 11.4 GW in 11M FY2024 led by a large project pipeline and low solar PV module prices.

While the project pipeline remains strong, there is a delay in signing of PPAs/PSAs by bidding agencies, which in turn has slowed down the bidding process over the past few months.

- **ICRA's outlook for the renewable energy (RE) sector remains Stable**, led by strong policy support, superior tariff competitiveness and sustainability initiatives by large commercial and industrial (C&I) customers. However, challenges remain on the execution front, including land and transmission infrastructure, delays in signing of power purchase agreements (PPAs), exposure to equipment prices and distribution utility finances.
- **The sector saw a capacity addition of 24.1 GW in 11M FY2025,** which was higher by 110% than the 11.4-GW added in 11M FY2024 driven by a large project pipeline. Earlier in FY2024, the capacity addition improved to 18.5 GW from 15.3 GW in FY2023, driven by the large addition of 7.1 GW in March 2024. This was supported by a sharp decline in solar photovoltaic (PV) cell and module prices and the exemption from the order on the Approved List of Models & Manufacturers (ALMM) available till March 31, 2024.
- **The tendering pipeline in the RE sector remains large** with 38.2 GW capacity auctioned in FY2025, following 47 GW auctioned in FY2024. **However, there has been a slowdown in bidding activity over the past few months** amid concerns over delays in signing of power sale agreements (PSAs) by the bidding agencies with the state distribution utilities in turn delaying the signing of the PPAs with the winning developers. The Solar Energy Corporation of India Limited (SECI) alone has about 10 GW capacity awaiting signing of PPAs/PSAs.
- **RE capacity addition is estimated at over 28.0 GW in FY2025 compared to 18.5 GW in FY2024. This will further rise to 32 GW in FY2026,** supported by the large project pipeline of 142.7 GW, as per the latest status report from the Central Electricity Authority (CEA), favourable module pricing and the impending expiry of waiver on inter-state transmission system (ISTS) charges in June 2025. Timely signing of the PPAs and PSAs along with the augmenting of transmission infrastructure remains key to sustain the scale up in capacity addition.
- **Prices of imported mono PERC modules remain low at ~8 cents/watt in February 2025**. While prices in the Indian market remain relatively high at 16-18 cents/watt owing to the imposition of the ALMM, the prices remain attractive for solar power developers based on prevailing bid tariffs. Given the imposition of ALMM for cells from June 2026, the module prices are likely to increase in FY2027 and the same must be factored in by the developers in the upcoming bids.

Highlights – II

BESS tariffs witnessed a sharp decline over the past 12 months led by the decline in battery pack prices. The bid tariffs for PSP projects have also declined in the last six months improving their competitiveness.

The Government of India has advised incorporating a minimum of 2-hour co-located ESS, equivalent to 10% of the installed solar capacity, in future solar tenders.

- With the reinstatement of the ALMM order for solar PV modules from April 1, 2024, **the import of solar cells and modules declined by 40% YoY in 9M FY2025,** thereby benefiting domestic module manufacturers. On the other hand, **the export of solar cells and modules also declined by 34% in 9M FY2025** due to increased scrutiny at US ports on sourcing of cells from China by Indian OEMs. Amid the threat of reciprocal tariffs by US, the sustainability of the export demand from USA remains to be seen.

- **Quoted bid tariffs for battery energy storage systems (BESS) witnessed a significant decline,** with the cost reducing from Rs. 10.84 lakh/MW/month in the first SECI tender in August 2022 to Rs. 2.22 lakh/MW/month (with viability gap funding) in January 2025. The decline in battery prices has improved the cost economics for BESS projects. **ICRA expects the energy storage capacity requirement to reach 50 GW by 2030** with 5-6 hours of storage, which will be met through a mix of BESS and pumped storage hydro projects (PSP).

- The **bid tariff for PSP projects also declined** from Rs. 1.48 crore per MW per annum in 2023 to Rs. 0.77 crore per MW per annum in February 2025. The decline in the prices has improved the competitiveness of energy storage systems. This sharp decline in bid tariffs has led to a moderation in storage tariffs to less than Rs. 4.0 per unit as per latest bids from Rs. 6.5 per unit in 2023. The viability of these bid tariffs remains linked with the capital cost of the projects and achievement of cycle loss of 25% or lower.

- **Energy storage systems (ESS)** to play an important role in maintaining grid stability given the intermittent nature of renewable power generation. Hence, the Ministry of Power has advised all Renewable Energy Implementing Agencies and State Utilities to incorporate a **minimum of 2-hour co-located ESS, equivalent to 10% of the installed solar capacity, in future solar tenders**. The integration of ESS with solar power projects would support grid stability and improve utilisation of transmission lines.

- **The ratio of upgrades to downgrades remains high** in the RE sector led by solar power producers. In 11M FY2025, the sector witnessed 28 upgrades and six downgrades. The upgrades were primarily led by successful project commissioning along with demonstration of satisfactory generation performance, favourable change in ownership along with improved generation performance and reduction in receivable position.

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Thank You!