India utility-scale solar

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Utility-scale wind and solar PV generation capacity have seen rapid growth in India on the back of proactive policy support and a mix of domestic and international capital. From around 30gigawatts (GW) in 2015, wind and solar capacity has grown four times to exceed 120GW at the end of 2022. This impressive growth has been driven by an ambitious target of 500GW of renewable power generation capacity by 2030, together with a clearly communicated pathway to reach this target, and a range of supportive policies by the central government.

Solar PV will make a significant contribution to this target. In 2022, USD15billion was invested in solar PV in India, a 50% increase compared with the 2017-2021 annual average investment. Under the Stated Policies Scenario (STEPS), average annual spending on solar PV in India is expected to reach USD20billion between 2031 and 2035. For India to be on track with its net zero by 2070 ambition - which is reflected in the Announced Pledges Scenario (APS) - average annual solar PV investment in this time frame would have to increase by a further 20%.

One aspect that is holding back even greater investment in India is the fact that the cost of capital for utility-scale solar PV is, for example, still 80% higher than that in advanced economies. This reflects various associated risks in the country, despite India"s overall progress and experience with utility-scale solar. According to the IEA Cost of Capital Observatory, investors report that regulatory, currency and off-taker risks were among the top three concerns impacting the cost of capital in India.

In the past years, India has significantly advanced its regulatory framework for investments into variable renewables and sought to address some of the risks which ultimately increase financing costs. The Government of India formulated clear policy goals by aiming to have 50% of power generation capacity fuelled by non-fossil sources by 2030, which in turn is supported by its Green Energy Corridor project, which aims to create sufficient transmission capacity to integrate the growing deployment of renewables, as well as India"s production-linked incentive scheme, which provides subsidies towards the creation of new manufacturing capacity for solar PV modules and batteries.

Improving auction design

Since 2012, the Ministry of Power has been commissioning an Integrated Ratings Exercise to evaluate the performance of DISCOMs. In the most recent ratings released in 2023, of the 57DISCOMs rated, 29 had a rating of B- or lower, reflecting relatively poor financial performance, distribution losses, poor billing efficiency and other operational metrics.

As a result of these reforms, there has been a gradual improvement in key metrics, including AT& C losses (reduced from 22% in 2020/21 to 16% in 2021/22) and the cost-revenue supply gap (declined from INR0.69

(rupees) per kilowatt-hour in 2020-2021 to INR0.22/kWh in 2021/22). Further, there was an improvement in payments to DISCOMs: between 2020-2021 and 2021/22, the delays in payments improved from 175 to 163days. In particular, as a result of LPS that enforced a penalty on DISCOMs for late payments to generation companies, the total outstanding dues by DISCOMs decreased from USD18billion in June 2022 to USD9billion in January 2024.

In addition to these structural measures to improve distribution company financial and operational performance, India has also attempted to address off-taker risk for renewable power projects in particular through the Solar Energy Corporation of India (SECI) Limited. Solar and wind projects at the central level are largely awarded through tenders administered by SECI, which signs PPAs with the generation companies. SECI in turn signs power sales agreements with state DISCOMs. SECI maintains a Payment Security Fund that protects generation companies from delays and defaults by DISCOMs, and has in place a set of rules and mechanisms that ensure that solar and wind generation companies get paid in a timely manner.

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India is on track to install 22.4GW of new solar PV generation capacity in 2024 according to energy consultancy firm JMK Research.

Data in JMK"s Q3 2024 renewable energy update showed that India installed around 13.2GW of new utility-scale solar capacity from January to September this year, a roughly 161% increase on the same period in 2023. It added 3.2GW of rooftop solar capacity in the same period, a 7% increase.

By the end of the year, utility-scale additions are expected to reach 17GW, rooftop 4GW and another 1.4GW of off-grid capacity.

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