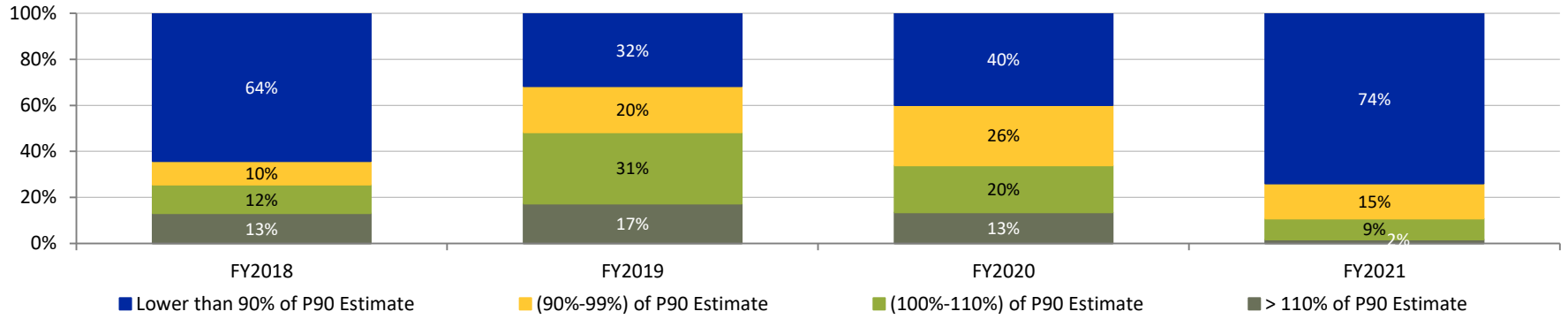
Performance of ICRA monitored wind & solar portfolio

ICRA-monitored wind portfolio witnessed a significant decline in PLFs in FY2021, while solar PLFs remained stable

ICRA-monitored wind portfolio witnessed a sharp decline in PLFs in FY2021

Exhibit 33: PLF performance of ICRA-monitored wind power portfolio vis-à-vis appraised estimate



Source: ICRA Research

Generation performance analysed for ICRA monitored wind power portfolio of ~3.2 GW over the period from FY2018 to FY2021

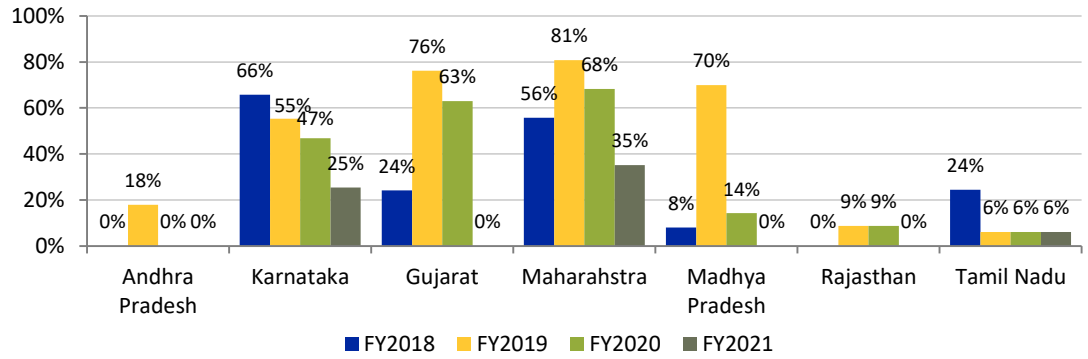
Wind PLF levels adversely impacted in FY2021 on account of lower wind speeds with only 11% of the sample capacity exceeding the P-90 estimates compared to 34% in FY2020

Under performance for some of the IPPs can also be attributed to grid curtailments as seen in few states and operating issues for projects with certain OEMs

Performance of majority of ICRA-monitored wind IPPs has improved in 7M FY2022 on a YoY basis. As first half contributes for majority of wind generation, wind PLFs are expected to improve in FY2022 over FY2021

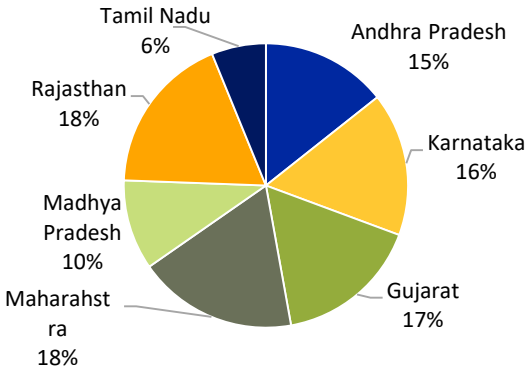
Wind PLFs remain lower than estimate in AP, Rajasthan & TN to a greater degree

Exhibit 34: State-wise trends for proportion of wind capacity in a state meeting P90 estimate



Source: ICRA Research

Exhibit 35: State wise mix of ICRA's sample wind capacity



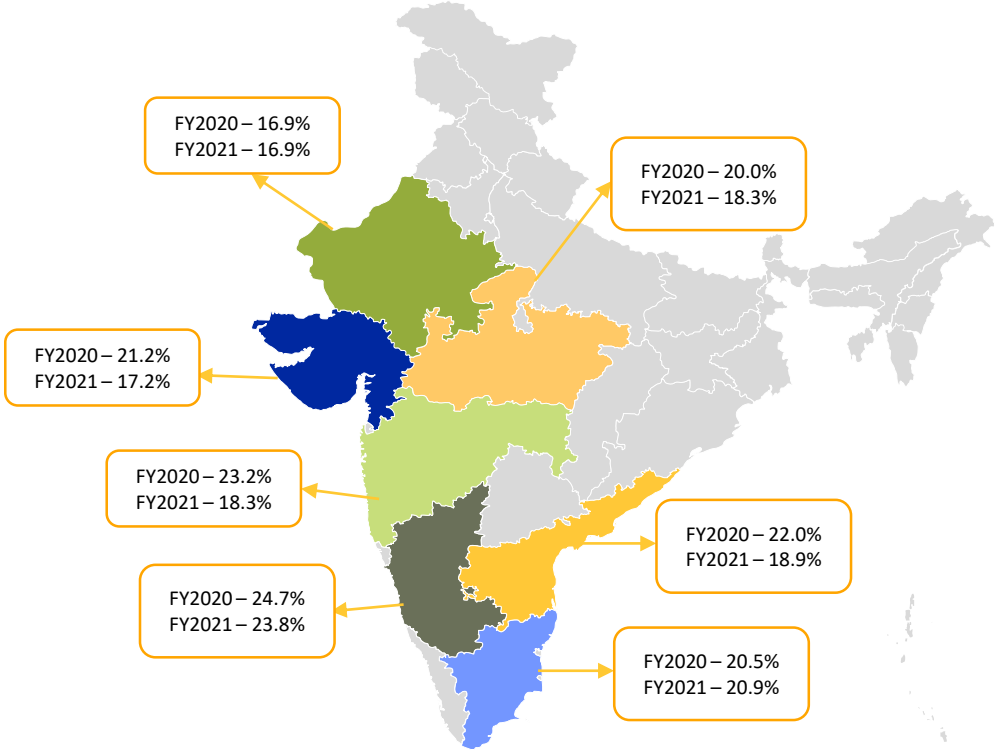
Over the past four years, wind IPPs in Andhra Pradesh (AP), Rajasthan and Tamil Nadu (TN) witnessed underperformance against P-90 estimate to a greater degree compared to IPPs in other state, partly owing to grid curtailments in AP & TN

APTEL recently passed an order, directing the state utility in Tamil Nadu to compensate developers for grid curtailments and issued strict directions against grid curtailments to all states

Within ICRA's sample, 35% of the capacity in Maharashtra and 25% of the capacity in Karnataka performed at PLFs better than P-90 estimates in FY2021. Most of the capacities in balance states performed below P-90 in FY2021

Significant drop in wind PLFs in FY2021 in some of the key states

Exhibit 36: Median wind PLFs over the last two financial years across key states



The median PLF in the key wind power generating states of Andhra Pradesh, Gujarat, and Maharashtra has dropped by 15-20% in FY2021 on a YoY basis.

The drop in Karnataka and Madhya Pradesh is relatively lower. On the other hand, the median PLF in Rajasthan and Tamil Nadu has remained flat.

IPPs facing cash flow pressure owing to lower PLFs have had to rely on available surplus cash/DSRA along with funding support from promoter groups. A moderation in interest rates has aided the IPPs in FY2021.

Source: ICRA Research

Wind PLFs remain lower than estimate in AP, Rajasthan & TN to a greater degree

Exhibit 37: OEM-wise trends for proportion of capacity meeting P90 estimate

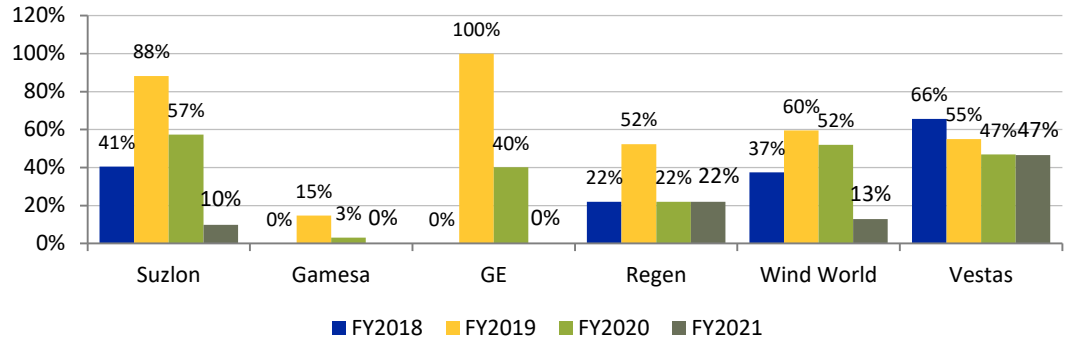
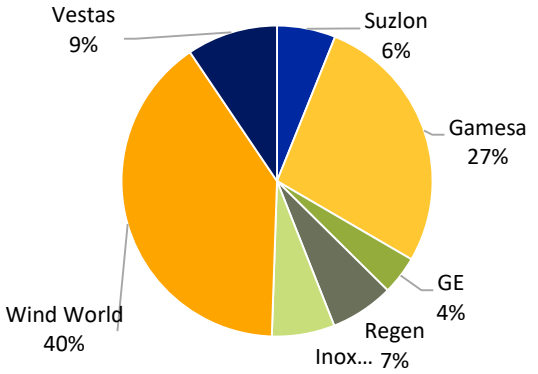


Exhibit 38: OEM mix of ICRA's sample wind capacity

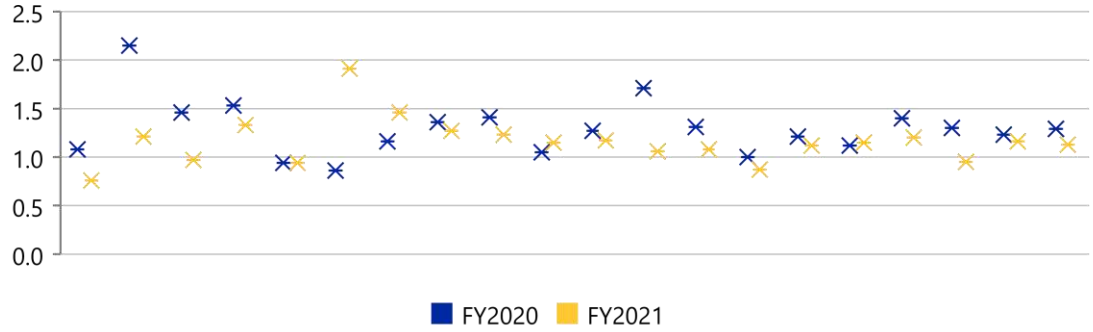


Source: ICRA Research

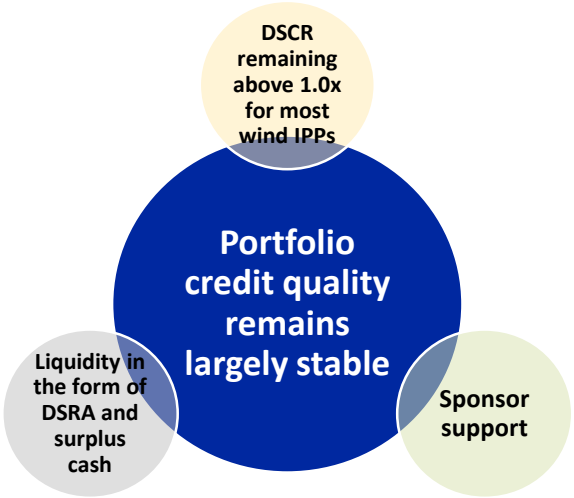
- In the sample data analysed by ICRA, Wind World is the key turbine supplier, accounting for ~40% capacity followed by Gamesa, which accounts for ~30% capacity. The remaining is spread across the other OEMs. Wind World's share is particularly higher in projects set up prior to 2015 whereas share of Gamesa, Vestas and GE is relatively higher in newer projects.
- While issues pertaining to weak O&M practices of some of the OEMs are well known, the prominent IPPs have actually either contracted a third party or started their own in-house O&M. Apart from machines of Vestas, wherein a large portion of the capacities performed at PLF's better than P-90 estimates across the years, the share of capacities of other OEMs which were performing at better than P-90 estimates was moderate to low and varied significantly across the years. However, one must note that the performance data is based on the sample set chosen and may vary for a different sample set.

Credit profile of wind IPPs was largely stable despite the lower PLFs in FY2021

Exhibit 39: DSCR metric for ICRA monitored wind IPPs in FY2021 vs FY2020



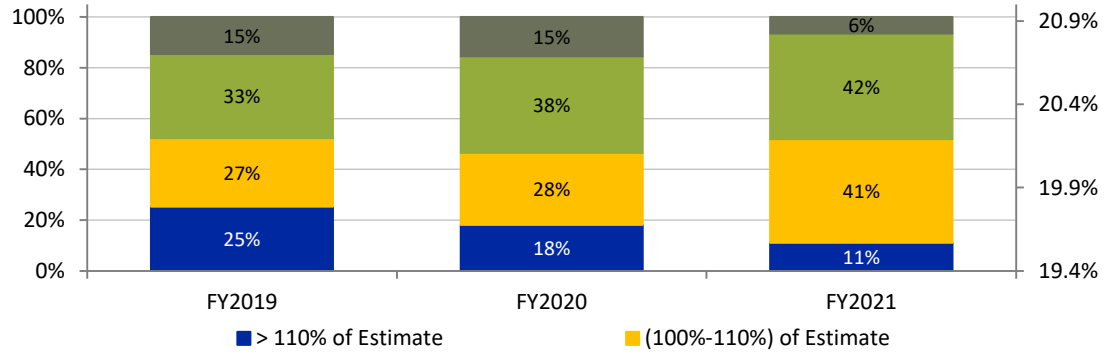
Source: ICRA Research



Credit profile of ICRA-rated wind IPPs remained largely stable despite the lower PLFs in FY2021 led by reasonable buffer in cash flows for most IPPs, funding support from parent for assets having a stronger parent and liquidity support including DSRA

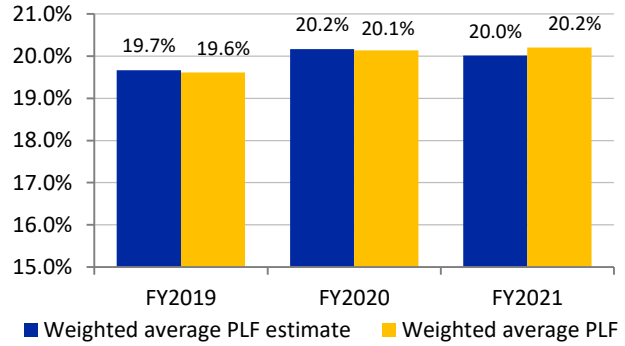
PLF performance of ICRA-monitored solar power portfolio remains stable

Exhibit 40: PLF performance of ICRA monitored solar power portfolio vis-à-vis appraised estimate



Source: ICRA Research

Exhibit 41: Average actual PLF vs estimate for the sample



Generation performance analysed for ICRA monitored solar power portfolio of ~3.3 GW over the period from FY2019 to FY2021

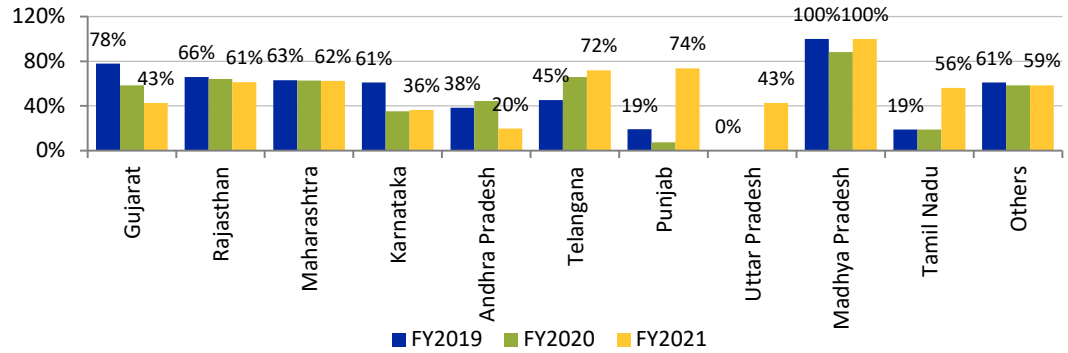
The performance of solar assets has been more stable compared to the wind assets. Of the sample portfolio, about 52% of the capacity performed better than estimated PLF in FY2021, which is similar to the previous two years

The weighted average PLF for the sample portfolio was 20.2% as against the estimate of 20.0%. The overall portfolio level performance in FY2019-FY2021 has broadly mirrored the appraised estimates

Solar PLFs for ICRA monitored projects in FY2022 are expected to follow the trends observed over the past three years

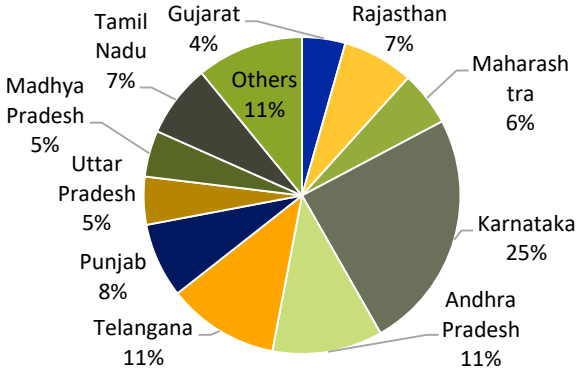
Mixed trend observed in performance against appraised estimate across states

Exhibit 42: State-wise trends for proportion of capacity in a state meeting appraised estimate



Source: ICRA Research

Exhibit 43: State wise mix of ICRA's sample solar capacity



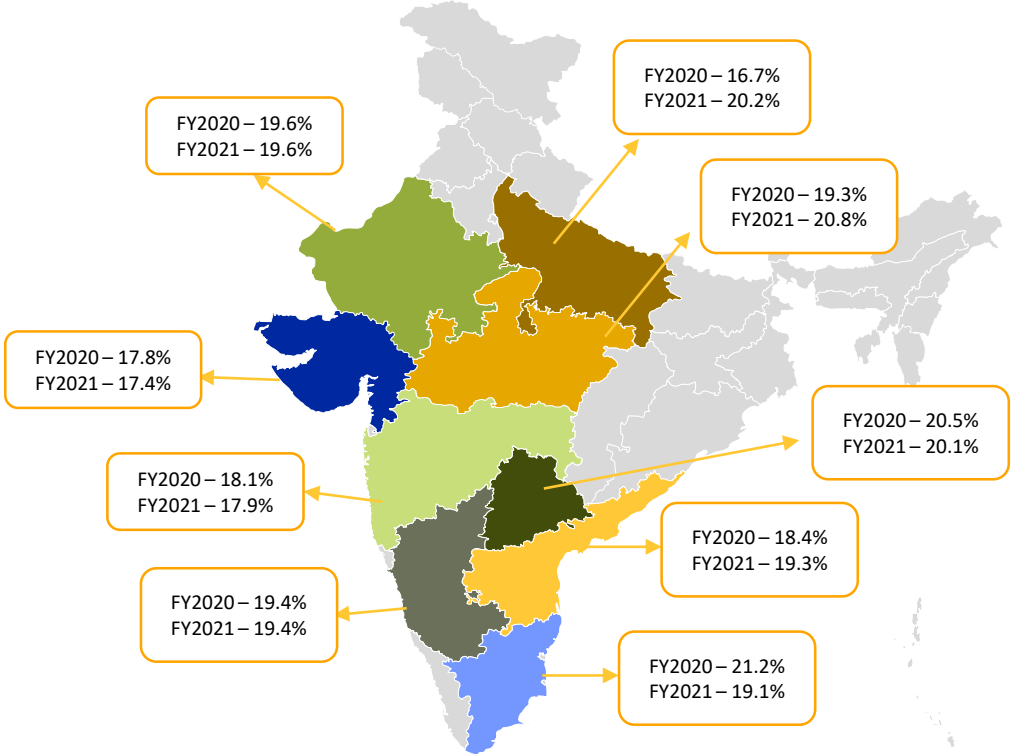
The solar power portfolio is more widely spread across various states against the wind capacity which is concentrated in 6-7 high potential states.

A large portion of the capacity in Rajasthan, Maharashtra, Telangana and Madhya Pradesh have shown performance closer to the designed energy levels in a more consistent manner

However, projects in Andhra Pradesh, Punjab, Tamil Nadu and Uttar Pradesh have shown under performance against the appraised estimates to a greater degree

Median solar power PLFs remain largely stable across states

Exhibit 44: Median solar PLFs over the last two financial years across key states



The median PLFs in the key solar power generating states remain largely stable varying between 17% and 20%

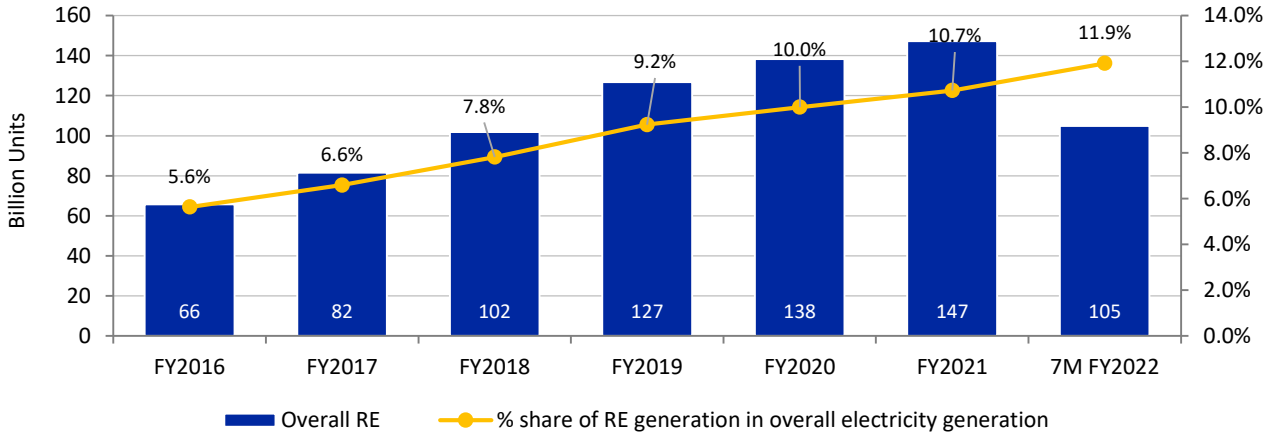
Within the states considered in our sample, solar IPPs in Rajasthan, Karnataka and Telangana have been able to achieve relatively higher PLFs

Most of these projects are commissioned prior to FY2018 and have AC:DC ratio less than 1.1x, unlike the recent projects wherein the ratio has gone upto 1.4-1.5x leading to higher AC PLFs

Source: ICRA Research

RE generation supported by improved wind season & higher solar capacity in FY22

Exhibit 45: Mix of RE generation as a % of all India electricity generation



Share of RE generation estimated to cross 11.0% in FY2022 and further cross 15.0% by FY2025

Share of wind and solar generation stood at 49% and 39% respectively in the overall RE generation in 7M FY22

Source: ICRA Research, CEA, MNRE

- The generation from RE sources reported a healthy growth of 17.1% in 7M FY2022 led by the recovery in generation from wind energy sources (YoY growth of 19.1%) supported by an improved wind season and higher generation from solar power capacity (YoY growth of 18.7%) supported by higher capacity. The share of RE generation stood at 11.9% in 7M FY2022 and is expected to end the year at about 11.1%, exceeding the 10.7% reported in FY2021.

Key Policy & Regulatory Updates

Rules notified by Ministry of Power for enforcing 'Must Run' status for RE plants

Electricity (Promotion of Generation of Electricity from Must-Run Power Plant) Rules, 2021

In October 2021, the Ministry of Power, GoI has notified these rules reiterating the must run status for wind and solar plants and that these plants are not subjected to curtailment, except for in the event of any technical constraint in the electricity grid or for reasons of security of the electricity grid

Compensation payable in case of curtailment

The wind and solar IPPs are required to be compensated for any curtailment at the rates agreed in the PPAs. In the event of any curtailment due to technical or security reason, the must-run power plant shall sell the electricity not scheduled by the procurer in the power exchange, which can be adjusted against the compensation payable by the off-taker

Guidelines issued to SERCs & SLDCs by APTEL on grid curtailment

In August 2021, APTEL issued directions to all state discoms, state electricity regulators and SLDCs stating that any curtailment of RE plants (for reasons other than grid security) shall be compensated at PPA tariff. The curtailment would not be considered as meant for grid security under certain conditions of the grid like system frequency, voltage level, margins available etc

Despite the orders issued by SERC & courts in the past, the grid curtailments persisted in a few states impacting the wind and solar PLFS, given the lack of compensation mechanism in the legacy PPAs. In this context, APTEL's order and the rules notified by the Ministry of Power are a positive for the renewable energy sector and are likely to act as a deterrent against grid curtailment by discoms & SLDCs