

# Ministry of Power notified RPO and ESO trajectory till FY2030 in line with the enhanced climate action targets

In July 2022, the MoP has notified the trajectory for renewable purchase obligation (RPO) from FY2023 to FY2030 and Energy Storage Obligation (ESO) from FY2024 to FY2030

The MoP has notified the ESO targets increasing from 1.0% in FY2024 to 4.0% in FY2030 measured as a percentage of total electricity consumption. For the ESO to be considered as fulfilled, at least 85% of the energy stored must be procured from RE sources

The RPO is set to increase from 24.61% in FY2023 to 43.33% by FY2030, comprising wind, hydro and other RPO. Wind RPO is to be met from wind power projects commissioned after March 31, 2022. Hydro RPO is to be met from large hydro projects commissioned on or after March 8, 2019. The other RPO can be met any RE source including large hydro projects. The approved RPO for FY2022 was 21.18%

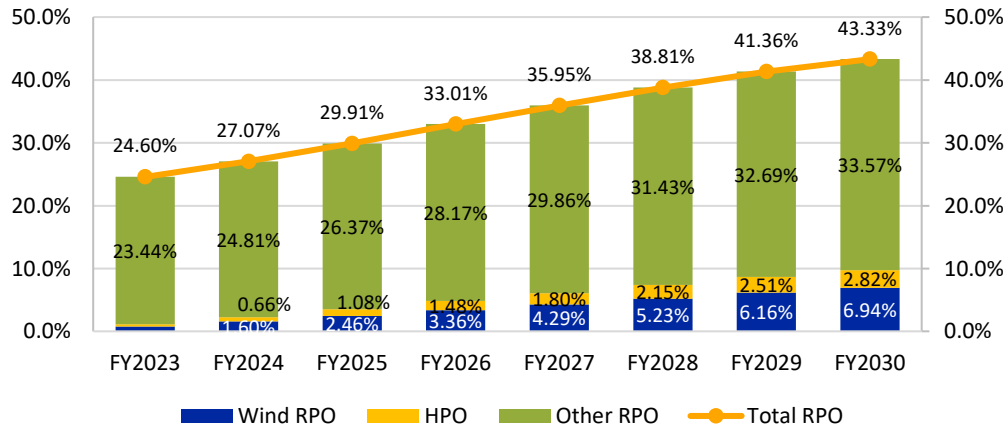
The MoP has recognised large hydro projects (> 25 MW) as part of RE w.e.f March 8, 2019. Accordingly, projects commissioned from this date will be considered for meeting the hydro RPO (HPO). Further, all large hydro projects will be considered in meeting the overall RPO

The MoP has notified specific RPOs for wind and hydro segments in view of the slowdown in capacity addition in these segments in recent years and the need for a balanced mix of sources in the overall RE  
**POSO** is entrusted with maintaining data related to RPO compliance

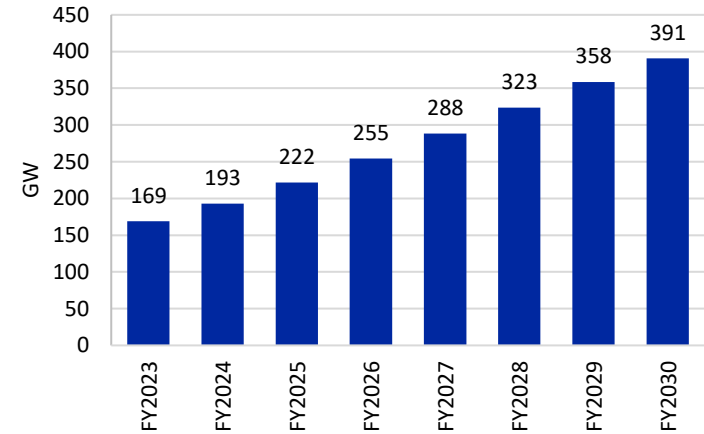
While the notification of RPO and ESO trajectory till FY2030 is a positive move, the adoption of the same by the state power regulators and compliance with the norms by the obligated entities mainly state discoms remains important for achieving the desired scale-up in RE capacity

# RE capacity required to meet the notified RPO target close to 400 GW by FY2030

**Exhibit 1: RPO trajectory approved by MoP**



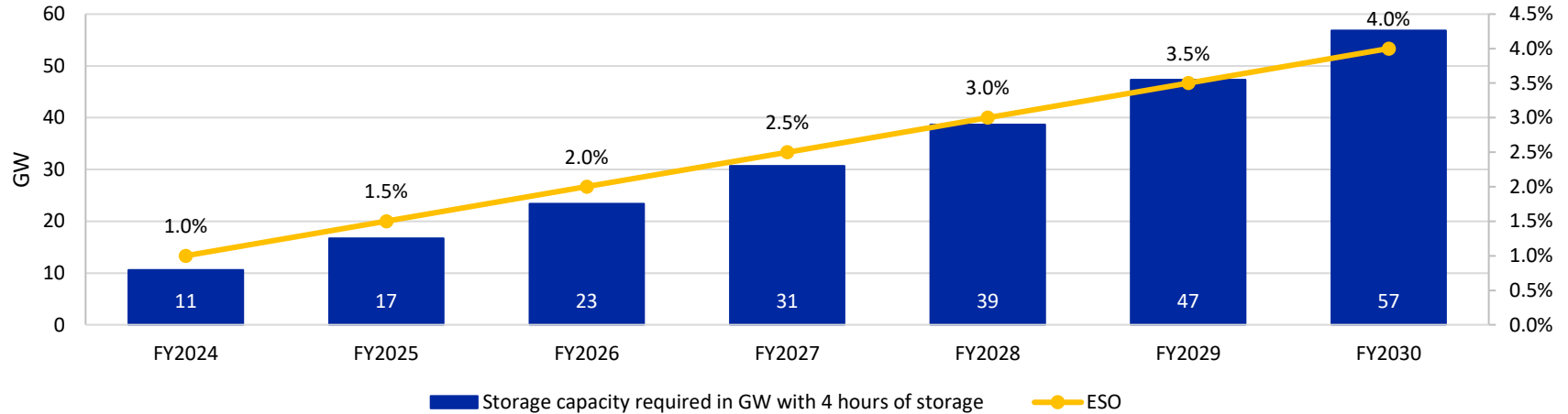
**Exhibit 2: RE capacity required to meet the RPO target by FY2030 including large hydro**



Source : ICRA Research, RPO trajectory notified by MoP; RE capacity estimates are based on 5% electricity consumption growth between FY2023-FY2030 and PLF assumption for the various RE sources based on prevailing PLF trends as well as expected improvement in PLF for new capacities driven by technology improvements

- The RE capacity including the large hydro capacity required to meet the notified RPO trajectory is estimated to be close to ~400 GW by the year FY2030. Given the installed RE & large hydro capacity of 157 GW as of March 2022, the incremental RE capacity requirement over the next ~8 years is sizeable at ~240 GW, translating into an annual capacity addition of ~29-30 GW per annum against the current level of 14 GW seen in FY2022.
- While majority of the RE capacity addition is expected to be driven by the solar segment, the wind RPO and HPO would drive the capacity addition for wind and large hydro segments. The incremental wind capacity requirement to meet the wind RPO of 6.94% by FY2030 is estimated at ~50 GW, translating to an annual addition of ~6 GW. Similarly, the incremental large hydro requirement to meet the HPO target of 2.82% by FY2030 is estimated at ~15 GW.

Exhibit 3: ESO trajectory notified by MoP and the expected storage capacity requirement to meet the targets

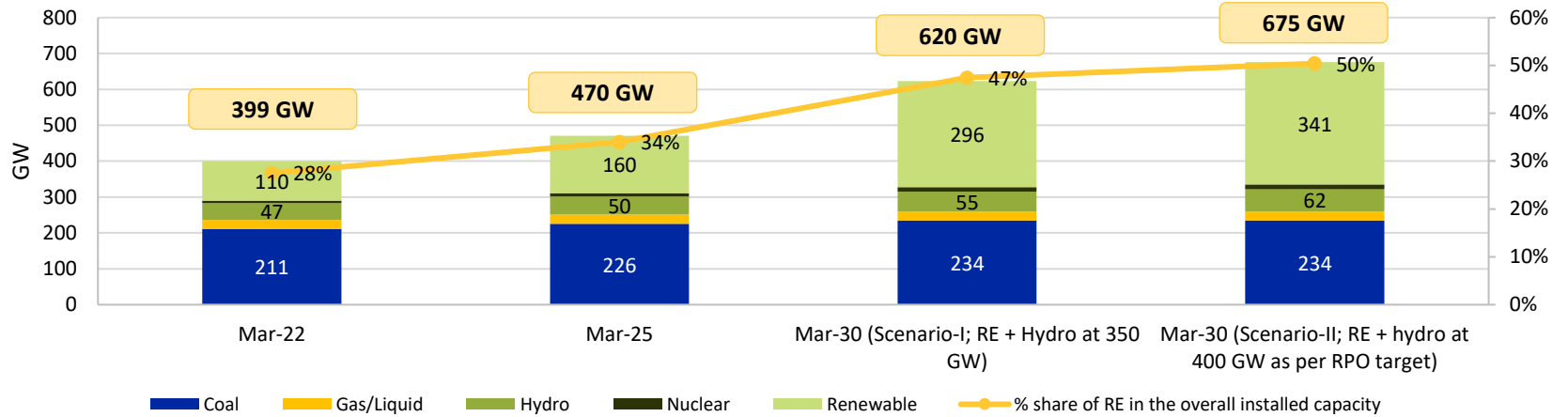


Source: ICRA Research, ESO trajectory notified by MoP; Storage capacity estimates are based on 5% electricity consumption growth between FY2023-FY2030

- The notification of trajectory for meeting a portion of the energy requirement through energy storage is expected to aid in promoting the development of storage capacity in the country, over the next few years. As seen from the Exhibit above, the country requires storage capacity of close to 50-60 GW with 4 hours of storage by FY2030 to meet the 4.0% ESO target, assuming a 5% growth in electricity consumption.
- The storage capacity is expected to be used to meet the evening peak demand, when solar is not available and enable the grid operators to manage the variable generation associated with solar and wind resources. However, the development of storage capacities requires timely adoption and compliance to the ESO norms at the state level and improvement in cost economics for storage technologies like battery / pumped hydro.

# Projected power generation capacity mix by 2030

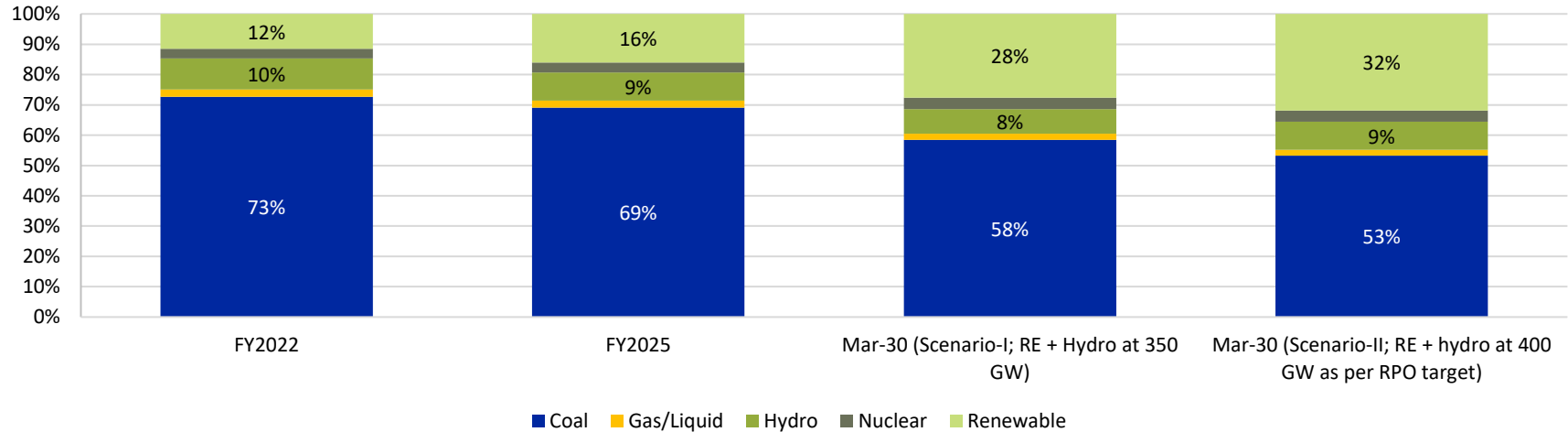
EXHIBIT 4: Projected power generation capacity mix by FY2025 and FY2030



- Based on the projects under development in the coal, hydro and nuclear power segments and the expected project pipeline, ICRA has estimated the installed capacity by FY2025 and FY2030. ICRA has considered capacity addition under two scenarios for FY2030, with the first scenario estimating the RE plus hydro capacity to reach 350 GW by FY2030. In the second case, which is the optimistic scenario as per the RPO targets prescribed by the MoP, the RE plus hydro capacity is estimated to reach 400 GW by FY2030. This apart, storage capacity would be required to meet the evening peak demand as well as managing the integration of RE power with the grid.

# Secular growth in the share of RE in electricity generation

**EXHIBIT 5: Projected electricity generation mix by FY2025 and FY2030**



- The rise in the installed RE capacity over the next decade is estimated to increase the share of RE power in the overall electricity generation mix from 11.5% reported in FY2022 to 28% in FY2030 in ICRA's base scenario. The share, including that of large hydro, would increase to 36% in FY2030 from 22% in FY2022
- In an optimistic scenario as per the RPO targets prescribed, the share of RE plus hydropower is estimated to reach ~42% of the generation mix by FY2030. Apart from easing challenges related to capacity addition, achieving such high level of RE share would require adequate grid infrastructure along with storage capabilities to manage the intermittency associated with the wind and solar power.

Source: ICRA Research, CEA and National Power Portal; ICRA has considered annual demand growth of 5.0% over FY23-30 and considered a gradual improvement in PLF levels for solar and wind plants based on efficiency gains and use of higher AC:DC ratio for solar plants