

OPINION: The rugged road to a cleaner grid

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New Delhi: The [Ministry of Power](#) (MoP) recently came out with [renewable](#) purchase obligation (RPO) targets for up to 2030. These targets mandate a specific percentage of the total electricity consumed in all states to be from [renewable energy](#) (RE) sources. The move is aligned with India's COP26 commitments of increasing its RE share in the electricity mix to 50% by 2030. India is battling against [climate change](#) and trying to phase down coal and the current RE targets and policies are highly ambitious and challenging.

The financial burden of RE policies

Some studies predict that increasing RE share and phasing out coal from the power sector is the cheapest way forward; however, this may not be entirely true. Although RE is cheaper than fossil fuels in some regions of India and prices for solar and wind energy are expected to fall in the coming years, RE policies (e.g., must-run status, RPOs) are putting a huge financial burden on the power sector, especially distribution companies (DISCOMs). According to a recent study, the total financial burden on Karnataka, Tamil Nadu, Telangana, and Andhra Pradesh was USD 1063 million in 2018. DISCOMs face this situation because they have been backing down cheaper conventional power sources by undertaking unplanned shutdowns or lowering the plant load factor (PLF) of thermal power plants while paying fixed costs of building those plants. The financial burden on DISCOMs might be an indication of the negative effect of the rapid transition to RE without proper planning.

For the fiscal year (FY) 2023, the Government has mandated that 24.6% of the total electricity consumed will have to be from RE resources. This includes 0.81% from wind power, 0.35% from hydropower, and 23.44% from solar and other renewable sources. The expectation is that DISCOMs will procure 43.33% of their total consumption from RE sources by 2030. State electricity regulatory commissions (SERCs) can notify the RPO trajectory for their respective states over and above the RPO fixed by the centre. Up to 2021–2022, there has been a substantial difference in RPO trajectories issued by SERCs and the MoP; therefore, adopting the new and more ambitious RPO trajectory might be challenging, especially for states with low RE potential/adoption. For example, Assam and Jharkhand will have to increase their RE capacities by more than 10 times to meet the RPO targets of 2023. Alternatively, they have to purchase power from RE-rich states or procure renewable energy certificates (RECs). The former necessitates major improvements in transmission infrastructure to reduce transmission losses, while the latter may worsen the financial health of DISCOMs as buying RECs will increase expenses along with phasing down conventional plants and paying their fixed cost.

Meeting base load and peak load

In addition to the financial burden, RE also has the issue of intermittency in supply. In India, peak load (the highest or peak demand for electricity during the day) generally occurs from 6 p.m. to 7 p.m. Unfortunately, we do not have blazing sunshine during this hour and, therefore, cannot depend on solar for meeting peak load.

For base load too, which is the minimum level of electricity consistently required over 24 hours across the year, intermittent RE sources such as solar and wind cannot be relied upon. To maintain

and produce a stable power supply with low cost and meet high peak demand, the base load and peak load power plants typically are coal or nuclear fuelled. Some renewable sources are reliable for base load, such as bio-electricity from burning crop residue, concentrated solar thermal, and hot rock geothermal. However, India is still at a nascent stage when it comes to these technologies, and we have limited potential for some of the sources, such as hot rock geothermal.

Way forward

To promote RE, India needs to study and redesign its current policies. A large proportion of India's population is unable to pay the total cost of the current energy supply. We need to deliberate on how they can be transitioned to renewable energy without financially burdening the power sector.

Compared to developed countries, our RE sources are inflexible due to the lack of technology advancements and higher costs, and we will be able to reduce the use of conventional power only over a period of time. In the meantime, we should ensure that coal-based electricity comes from newly commissioned power plants that conform to pollution control norms.

The Government should fast-track the Green Energy Corridor programme and strengthen interstate and intra-regional transmission corridors to transmit green power from RE-rich states to RE-poor states to achieve their respective RPO targets.

For expanding the commercial usability of technologies and storage required to increase the capacity of REs, the next two decades will be crucial. This will give time to recently commissioned conventional power plants with a life of about 20 to 30 years. While the availability of low carbon alternatives makes the power sector one of the "easier to abate" sectors, it is still fraught with financial and technical challenges and the transition will have to be slow, to avoid financial burden on DISCOMs.

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