

How Thermal Generating Companies Can Stay in Power

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India, which is the second-largest coal producer and both the third-largest producer and consumer of electricity in the world, has committed to an RE-dominant future with an ambitious target of 450 GW of RE capacity by 2030. With the global push for clean energy and falling RE costs, there is no backing away from this goal now. Given this, what is the contribution that state generating companies (GENCOs), mainly operating thermal capacity, can make for this transition to be successful?

We, at CSTEP, undertook a study to prepare a roadmap for Karnataka state GENCO as RE (solar and wind) becomes a dominant source of energy in Karnataka. The state has already surpassed the Ministry of New and Renewable Energy's 2022 target of 11 GW of installed RE capacity. Currently, 12.3 GW RE contributes to 45% of the total installed capacity in the state. Our analysis reveals that in an aggressive scenario of RE development, the state is capable of commissioning 35.5 GW of RE capacity by 2030. With this, RE capacity contribution to Karnataka's total installed capacity will increase to 71%.

The study also revealed that increasing our battery storage capacity is key to mainstreaming RE. At least 5.95 GW of storage capacity (battery and pumped-hydro) will be required by 2030 to manage the high RE future. While such capacity development is important for Karnataka's clean energy transition, it also has a distinct bearing on the operation of existing thermal power plants (TPPs).

Due to huge availability of cheaper RE and must-run status given to RE generation, the distribution companies (DISCOMs) shy away from buying electricity from TPPs, leading to their low Plant Load Factor (PLF) and reduced revenue. This spells disaster for state GENCOs across the country. For Karnataka state GENCO, currently having 9 GW of installed capacity, 5 GW capacity (55%) comes from coal-based TPPs. The coal capacity is now operating at lower PLFs ranging between 34% and 55% due to continuous ask of backing down or shutting down of operations.

The Central Electricity Authority (CEA) has also recommended the closure of 8 units of the Raichur TPP by 2022. The writing on the wall is clear — coal-based TPPs are on their way out. A similar situation is seen in other states as well. For Gujarat and Andhra Pradesh, the CEA has recommended retirement of thermal plant capacity of 2,215 MW and 1,260 MW, respectively, which account for 37% of each state GENCO's thermal capacity.

However, our study showed that all is not (yet) lost for existing TPPs, and has proposed alternative business models for thermal assets, which can, in turn, help the state GENCOs contribute to India's clean energy transition. We could utilise surviving thermal assets to support grid flexibility, as recommended by the Ministry of Power's July 2020 guidelines for Thermal-RE bundling. This could help solve the twin issues of managing intermittency issues created by huge RE in the grid, along with utilisation of existing thermal assets. Bundling can also make the thermal assets' cost of generation more competitive. In addition, thermal assets offering energy in the open access trade targeting high-energy-intensive industries in Karnataka would be a win-win situation for both the state GENCO and industries with continuous consistent demand, such as steel, cement, fertiliser, paper and pulp, and textile. Incentivising grid flexibility support from thermal assets would further smoothen the transition and help in utilising stranded thermal assets.

Our study found that the smooth transfer of RE to other states, strict compliance of renewable purchase obligations (RPOs), and upgradation of the existing transmission network can facilitate seamless interstate power flows. However, these can only be beneficial if policy interventions complement such solutions. Coal-based TPPs have been the backbone of development in the last century. However, with RE poised to form the base for development and the means to address the climate crisis in coming decades, existing TPPs can support necessary transitions and make way for a cleaner and more energy-secure future.

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