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Environmental Rating of Coal-Based Thermal Power Plants

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Studies point out that despite the Government of India's renewable energy target of 450 GW by 2030, electricity generation from coal-based thermal power plants (TPPs) will still be more than half of the total supply. TPPs release pollutants, such as sulphur dioxides (SO_x), oxides of nitrogen (NO_x) and particulate matter (PM), which have a serious impact on human health. Coal mining and fly ash from coal combustion pollute both surface and ground water. Additionally, TPPs are responsible for around 40% of India's total GHG emissions. Any form of climate action has to address emissions from coal power plants.

To rein in pollutants from coal-based TPPs, the Ministry of Environment, Forest and Climate Change (MoEFCC) announced stringent norms in 2015, which the TPPs were required to comply with by December 2017. However, there has been little progress in installation of pollution control measures. For instance, only 6 units (2.2GW) have so far installed Flue Gas Desulphuriser (FGD), which cuts SO_x emissions, against a plan for 448 units (169.7 GW). Several reasons, such as huge investment, technology unsuitable for Indian coal, inappropriate norms, etc., have been cited for the delay. This is unfortunate given that [several studies](#) emphasise that the health benefits of implementing these standards outweigh the investment costs.

India's environment protection regulatory framework relies on punitive actions, such as environmental penalties, plant closure, etc., which are neither effective nor practical. We believe that economic tools that incentivise generation by cleaner power plants while penalising the polluting ones will be far more efficient.

The Way Forward

To expedite the adoption of emission control technologies as well as to incentivise generation by cleaner, efficient plants, we suggest modifying the Merit Order Dispatch (MOD), the policy mechanism used by DISCOMs to schedule power from generating units in the order of lowest variable cost.

Many old, inefficient plants have low variable costs due to access to cheap coal. In addition, the new emission norms for older, smaller units are lesser, and can be met by installing cheaper control measures, giving them additional cost advantage compared to newer, efficient TPPs.

This outcome is the opposite of what is desired but, under our proposed recommendation, it can be addressed by modifying the MOD mechanism.

We suggest supporting generation of cleaner plants and offsetting the unreasonable cost penalty being borne by them by considering environmental externalities of TPPs. First, we should assess the environmental externalities of TPPs – spread of emissions, impact of air pollution on health of communities, GHG emissions that are driven

by plant efficiency, water use and pollution, fly ash management. These negative impacts can be consolidated to generate an overall Environmental Impact Rating (EIR), say from 1 to 10, with 1 being the cleanest.

The EIR can then be translated into an environmental cost using a scaling factor, which considers the impact of various externalities. This environmental cost may be used in several ways to incentivise clean plants. It may be added to the variable cost of plants to determine MOD. Since cleaner plants will have low environmental cost they will move up the ladder increasing their generation and revenues while reducing the sector's overall impact on environment. In addition, government could also design policy using an incentive-penalty approach wherein, the dirtier plants (high EIR rated) are penalised while cleaner plants (low EIR rated) are incentivised. This will give the cleaner plants dual benefits- early power despatch and additional tariff.

These tools will help clean plants recover the investment in pollution control equipment faster, expediting installation and operation of pollution control technologies. Given the twin problems of severe air pollution across wide swathes of India and continued resistance to invest in pollution control by TPPs, it is time to acknowledge the limitations of punitive regulatory actions and to explore economic tools and incentives to encourage decisive steps by the power sector.

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