

Abstract

Coal-based thermal power plants (TPPs) are one of the major culprits contributing to the degrading ambient air quality globally. To address this issue, the Government of India revised the emission standards for coal TPPs in 2015. However, the high upfront cost for installing emission control technologies and ambiguity over their impact on electricity tariff and regulatory provisions have led to delays in the implementation of these technologies. In this study, the total investment—including capital, and operational and maintenance costs—required to meet the new emission standards for all existing and proposed TPPs by 2030 and their tariff implications are estimated. Moreover, the potential system-wide reduction in pollutant emissions by 2030 is also calculated.

The detailed techno-economic analysis conducted in this study shows that a total investment of USD 59 billion (INR 3,906 billion) is required to meet the new emission standards across all Indian TPPs. In addition, levelized cost of electricity (LCoE) analysis showed that the electricity tariff would increase by 0.37–1.13 cents/kWh (0.25–0.75 INR/kWh) (around 9%–25% increase over the base electricity tariff), depending on the installation of suitable control technologies. Finally, the likely challenges in installing and operating the new controls are identified, and suitable policy recommendations are provided.