

Health benefits related to a less carbon-intensive power sector in India

Assessing the co-benefits of decarbonizing the power sector

Synopsis

India has already gone ahead with several policy initiatives to steer the economy towards higher standards of living, work towards poverty eradication as well as enhance the access to cleaner energy forms to larger sections of our population. Through the National Action Plan on Climate Change (NAPCC), the Indian government recognized that India needs a directional shift in its economic growth pathway in order to achieve its developmental objectives while effectively addressing the threat of climate change. Power is one of the most carbon intensive sectors as most of electricity generation capacity in India is coal based. In view of the above, India's Intended Nationally Determined Contribution (INDC) aims to base 40% of the total installed power generation capacity on non-fossil fuel resources by 2030 with international support on technology transfer and financing. This includes an ambitious target of achieving 175GW of renewable energy by the year 2022 and reducing the emissions intensity of GDP by 33 to 35% from 2005 levels by 2030.

Addition of these low carbon pathways may also lead to several co-benefits. Hence, it becomes extremely important to evaluate and quantify the co-benefits for further highlighting the benefits of climate change mitigation activities to policy makers and private investors. In this context, TERI has conducted this study which is supported by the Institute for Advanced Sustainability Studies (IASS) with the objective to carry out an assessment of health co-benefits related to a less carbon-intensive power sector in India. In this study, health impacts related to outdoor air pollution and particularly from power sector was assessed till 2050 under three energy scenarios i.e. business as usual (BAU), Intended Nationally Determined Contributions (INDC) and Ambitious (AMBI). BAU scenario represents climate policies rolled out till 2016, and an ambitious high GDP growth as envisaged by the Government of India. INDC scenario includes various climate policies and targets adopted in India's INDC submission, while AMBI represents high mitigation ambition (beyond INDC & towards an overall aim of keeping temperature well below 2 degree Centigrade) keeping development of the country at the forefront.

In the BAU scenario, the estimated PM₁₀ emission from different sectors is projected to increase by 6% during 2031 and decrease by 7% during 2051 in comparison to year 2021. The estimated PM₁₀ emissions have decreased between 2031- 2051, due to penetration of LPG in residential sector, BS-VI fuel and technology in transport sector, and introduction of stringent standards for industries and power plants. By 2051, emissions are projected to be 18% and 27% lower in INDC and Ambitious scenario, respectively, with respect to 2051 BAU scenario. The estimated emissions for different scenarios were fed into an air quality model to predict ambient PM_{2.5} concentrations and estimate associated health impacts for the year 2021, 2031, 2041 and 2051. The air quality concentrations and associated health impacts have followed somewhat similar trend as of emissions. However, this is to

be noted that trends are not linear, considering atmospheric chemistry between gases like ammonia, NO_x and SO₂, which convert into secondary PM_{2.5}. Moreover, the population density in India is as uneven as the pollutant concentrations causing nonlinearity in the health impacts across the scenarios. Health assessments shows that most affected states due to air pollution are in IGP- Delhi, Punjab, Bihar, Rajasthan, West Bengal and Uttar Pradesh. The scenario analysis suggests that the pollutant concentration and associated health impacts are expected to rise between 2016-2051, in a BAU scenario. In INDC and Ambitious scenario (which were designed primarily with climate change mitigation perspective) will lead to substantial co-benefits both in terms of air quality and health impacts.

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COBENEFITS is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag. For more information please visit: www.cobenefits.info

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