POLICY BRIEF

Phasing-out coal in India

Status quo

India has an installed coal capacity of 233 GW, while the share of coal in the electricity generation amounts to 79%. In addition, India still invests into new coal plants with another 34 GW under construction and 21 GW planned.

India's energy-related CO_2 emissions tripled from 530 $MtCO_2$ in 1990 to 2,308 $MtCO_2$ in 2018, with coal accounting for almost 70%. The carbon emissions of the Indian power sector are projected to increase by 50% until 2040 under the IEAs Stated Policies Scenario, while they would decrease by 30% in the Sustainable Development Scenario.

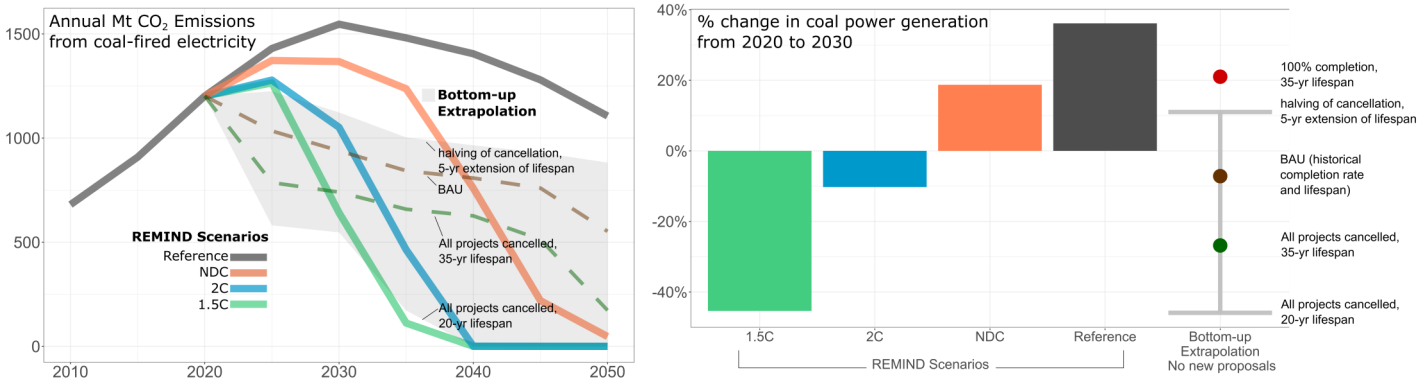
The electricity generation has tripled between 2000 and 2020 and is expected to grow by 5% per year until 2040. The IEA expects the share of coal in the power mix to decrease from 68% in 2020, to 34% in 2040, while that of renewables shall increase from 4% to 31%. However, the installed coal capacity is expected to be in a similar order of magnitude as of today.

Coal phase-out scenarios

To limit global warming, the Paris Agreement from 2015—signed and ratified by India—requires keeping the average temperature increase to well below 2°C and possibly 1.5°C above pre-industrial levels.

Scenarios on carbon emission pathways project that emissions from coal-fired electricity in India need to reach net-zero by 2040 to remain below 1.5°C (see left figure below). Achieving the 1.5°C target implies that, by 2030, electricity generation from coal needs to decrease by 45% compared to today's levels. Allowing for 2°C warming would still require India's current generation to decrease by 10% by 2030 (see right figure below).

Achieving the 1.5°C target does not allow for any additional coal development, but instead implies even reducing the lifespans of operating plants to 20 years.



REMIND model results and bottom-up extrapolation for coal in India.
Left: CO_2 emissions for different scenarios (1.5C, 2C, NDC and Reference). "NDC" represents the first-round Nationally Determined Contributions, "Reference" the currently implemented national policies. The grey area shows bottom-up extrapolation assuming no new coal project proposals. **Right**: coal phase-out in 2030 in percentage of the 2020 generation for different scenarios and bottom-up extrapolation with varying assumptions on completion rates of new coal plant projects and lifetimes of existing plants. Extrapolation is conducted using the Global Coal Plant Tracker January 2021 release and the IEA World Energy Balances 2017 edition.

Political economy

Achieving a rapid coal phase-out requires to take the political economy into account. This reveals several challenges. In particular, challenges arise from coal benefitting the regional development and vested interests of large conglomerates, while pollution regulations remain unenforced.

Relatively poor coal mining regions in the east have been strongly benefitting from the coal industry. Coal induces regional investment, creates employment, redistributes wealth, while publicly owned coal companies support building houses, public infrastructure, and provide healthcare services. It furthermore induces employment in other sectors, such as road construction, transport, hotels, domestic servants, and vegetable sellers. Regional policy-makers thus benefit during elections when fostering coal mines or power plants as such activities ensure public support.

Private profits of coal conglomerates arising from highly profitable power purchase agreements led to vested interests and strong support for further coal deployment. Both public and private companies have strongly ramped coal electricity production in the last two decades, while the power market structure led to systematic disadvantages for renewable electricity deployment. Despite a recent halt of new coal power projects and an increasingly rapid deployment of cheap renewable electricity, it remains to be seen whether these trends will persist in the long run. Once renewables start to replace baseload capacity, battery and system integration costs will increase the price of renewable power production.

In contrast, there are other objectives supporting the phase-out of coal and the uptake of renewables. Most importantly, pressure from a rising middle class led to the adoption of anti-pollution regulation. Enforcing this regulation would potentially lead to the direct retirement of several GW of coal plants. However, thus far the enforcement remained limited, as deadlines for implementation were postponed repeatedly due to successful lobbying of power producers.

Solutions

The Covid-19 pandemic has led to a stark decrease in electricity demand. The demand reduction was almost entirely borne by the coal power plants, exacerbating their precarious financial situation and further reducing the demand for new coal-fired power plants. Most new coal plants are on hold. However, India's key objectives remain unchanged, keeping the construction of new coal plants a constant option. We propose **three policy mechanisms to phase-out coal** and safeguard the transition to renewables:

i) **Inclusive regional transition schemes:** Implement policies that lower the regional dependency on coal and ensure a just transition. These may include direct support for previous coal workers, regional investments creating new employment and thus become new sources of regional fiscal income.

ii) **Enforce pollution regulation:** Reduce incentives for using coal and, at the same time, lift health and local environmental co-benefits. Strict enforcement would directly lead to power plant shut downs, while further making coal electricity less competitive compared to renewables.

iii) **Reforming the power market:** The power market structure needs to ensure that renewables become cheaper than coal, also in the long term. Power purchase agreements need to be redesigned, such that renewable investments become safer and more profitable, while removing long term PPAs with a guaranteed payment of fixed costs for coal-fired power plants. In particular, it requires schemes that consider eventual new expenditures for grid balancing and storage adding to increasingly cheap solar energy.

IMPRINT

Mercator Research Institute on Global Commons and Climate Change (MCC) gGmbH
MCC was founded jointly by Stiftung Mercator and the Potsdam Institute for Climate Impact Research (PIK). Director: Prof. Dr. Ottmar Edenhofer.www.mcc-berlin.net/en
PEGASOS is a joint endeavor of the Westfälische Wilhelms-Universität (WWU), PIK and MCC.

Editing: Nico Bauer, Stephen Bi, Francesca Diluiso, Niccolò Manych, Lorenzo Montrone, Nils Ohlendorf, Jan Steckel. Content derived from expert interviews analyzed by Montrone et al. (2021): 'The Political Economy of Coal in India – Evidence from Expert Interviews'. *Energy for Sustainable Development* 61 (April): 230–40. https://doi.org/10.1016/j.esd.2021.02.003

November 2021

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Federal Ministry of Education and Research
FONA Research for Sustainability
MCC Mercator Research Institute on Global Commons and Climate Change
Dialog zur Klimaökonomie