India Coal to Clean Savings
Methodology

Data Sources

The data on India's prospective utility-scale solar and wind capacity is gathered from Global Energy Monitor's January 2023 versions of Global Solar Power Tracker and Global Wind Power Tracker. The January 2023 solar and wind datasets are available for download under a creative commons license for non-commercial users.

The utility-scale solar, wind and coal power capacity factors for India are taken from Government of India Central Electricity Authority's Draft National Electricity Plan 2022. Estimates on power generation per tonne of coal is taken from the EIA. The average fuel-only cost for producing electricity by burning coal, as well as total installation costs for wind and solar projects in India are gathered from IRENA's Power Generation Costs Report.

Summary Table		
Prospective utility-scale solar power capacity	57,291	MW
Prospective wind power capacity	19,082	MW
Projected electricity generation	153,556,173	MWh
Coal capacity (counterfactual scenario)	31,689	MW
Estimated coal as fuel needed	78,026,511	Tonnes
Cost savings is avoided coal fuel costs	19,501,633,983	US$

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Data collection is done via secondary research by GEM staff; the Wind and Solar methodology pages describe this process. The Wind and Solar FAQ pages also provide information about the datasets.

India's prospective utility-scale solar (57GW) and wind (19GW) prospective capacity were multiplied by their respective capacity factors[1] to estimate the potential electricity generation (MWh).

To estimate cost savings, the analysis assumes a hypothetical counterfactual where, instead of building the prospective utility-scale solar and wind capacity, India would build coal powered plants to generate the same amount of electricity.

The total electricity generation from renewables, calculated above, is used as the base to estimate the amount of coal (in tonnes), and coal power plant capacity (MW), that would be needed to generate the same amount of electricity.

IRENA's Power Generation Costs Report estimates that the fuel-only cost of producing electricity by burning coal in India is $127/MWh. Using our estimates from above, we multiply total electricity generation with the fuel-only cost of coal to estimate that India can save US$19.5 billion per year with its projected buildout of utility-scale solar and wind power projects.

[1] https://cea.nic.in/wp-content/uploads/irp/2022/09/DRAFT_NATIONAL_ELECTRICITY_PLAN_9_SEP_2022_2-1.pdf