Issues in Focus from *International Energy Outlook 2020*: Interregional Electricity Trade in India

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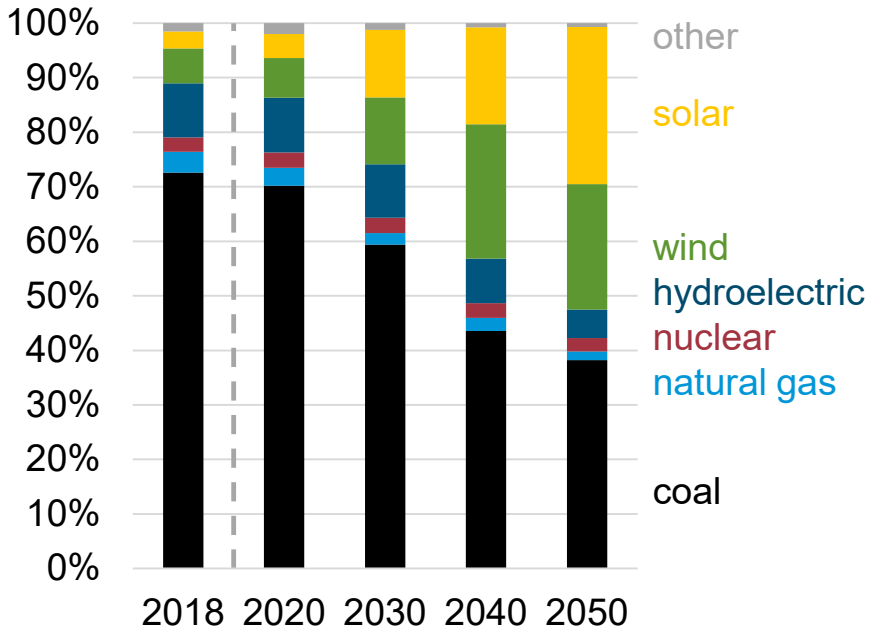
IEO2019 projected renewables to make up largest share of India's electricity generation fuel mix in 2050

Share of net electricity generation, India
percent



- India is the world's third-largest energy consumer, with electricity demand projected to grow 4.7% per year on average (2018–50).
- Wind plus solar generation share increases to more than 50% in 2050.
- Coal-fired generation more than doubles, but its share of electricity generation falls to 38% in 2050.

Source: U.S. Energy Information Administration, International Energy Outlook 2019 (IEO2019)

The analysis examines interregional electricity trade on generation mix

IEO2019

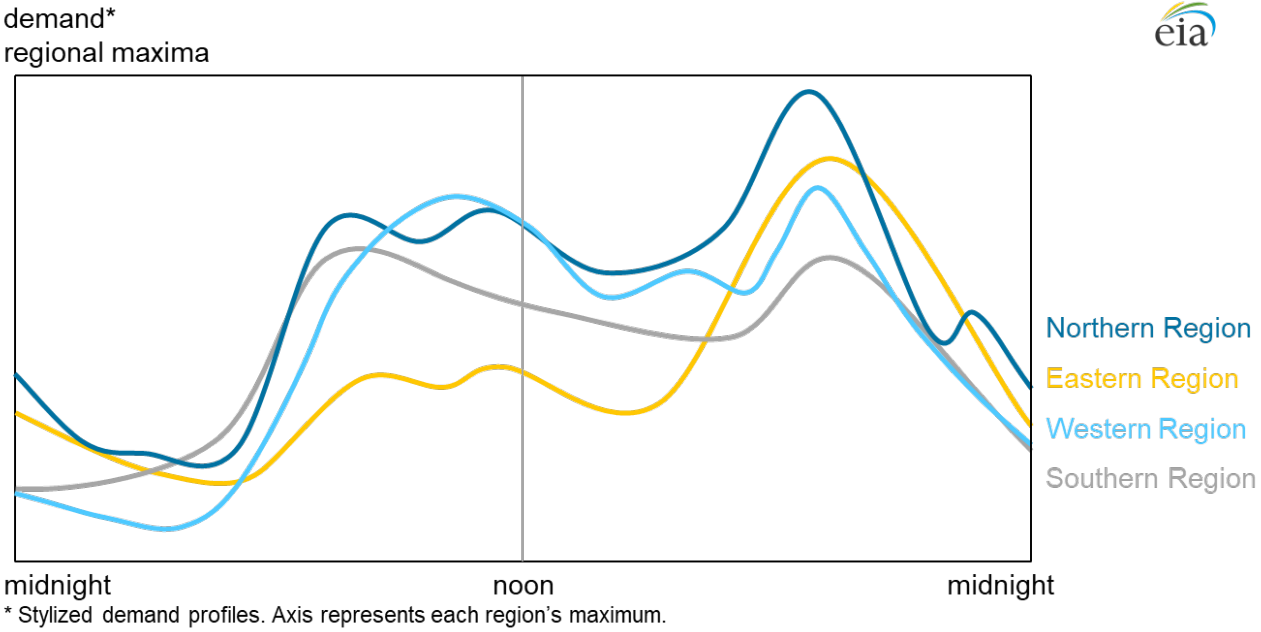
Increase geographical representation to five separated but connected power regions

- Fuel costs
- Renewable resources
- Capital costs
- Transmission capacity
- Load shapes

IEO2020

India's electricity demand is reflected in varying demand patterns

India figurative hourly demand by region

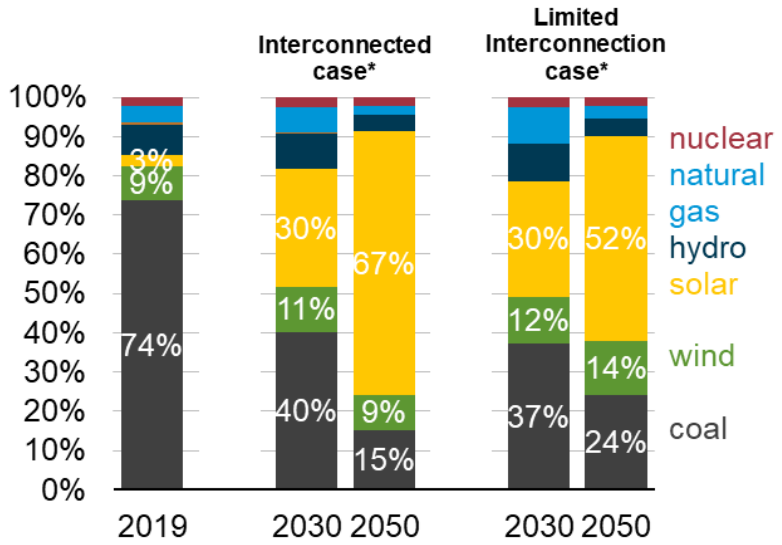


* Stylized demand profiles. Axis represents each region's maximum.

Source: U.S. Energy Information Administration, based on Power System Operation Corporation Limited, Electricity Demand Pattern Analysis 2016.

Generating fuel choices are affected by interregional electricity trading

Share of India electricity generation for selected fuels by scenario (2019, 2030, and 2050)
percent



Source: U.S. Energy Information Administration, *International Energy Outlook 2020*

- Interregional trading allows regions to trade lower cost excess electricity to meet demand that would otherwise be met with higher cost generation.
- Limited connectivity between regions typically causes existing fossil fuel generation to serve in-region demand.
- The share of coal-fired generation declines as more cost competitive solar and wind meet incremental regional demand.

**Interconnected case and Restricted Trade case refer to Cases 4 and 5, respectively, that are detailed in the analysis.*

The Interconnected and Limited Interconnection cases highlight the effect of grid coordination and trading between regions on fuel mix

- Lower cost renewables, mostly solar and wind, are favored when a region is allowed to trade its lower cost excess electricity to regions that would otherwise need to meet demand with higher cost in-region generation.

- Interregional electricity trade limitations between regions favor existing in-region generation which is often fossil fuel.

- However, in both cases, the share of coal-fired generation is projected to decline as solar and storage, together, become more economically competitive in meeting incremental regional demand.