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

Center for Strategic and International Studies  
October 14, 2020 | Washington, DC

Manussawee Sukunta, Senior Renewable Electricity Analyst  
U.S. Energy Information Administration
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.

The analysis examines interregional electricity trade on generation mix.

Increase geographical representation to five separated but connected power regions

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

 Generating fuel choices are affected by interregional electricity trading

<table>
<thead>
<tr>
<th>Year</th>
<th>Interconnected Case*</th>
<th>Limited Interconnection Case*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>2030</td>
<td>30%</td>
<td>67%</td>
</tr>
<tr>
<td>2050</td>
<td>11%</td>
<td>9%</td>
</tr>
</tbody>
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- 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.