Methodology

The backbone of the SET scores is the data dimensions selected, along with the sub-parameters. As stated above, there are four broad dimensions. These dimensions have seventeen parameters in total. A rationale for selection and a mode of measurement backs each of these parameters.

Figure 2: Dimensions, Parameters and Rationale
Selection of Parameters

We selected the parameters under each dimension based on two main criteria: a) relevance to the four dimensions of India’s clean electricity transition and b) availability of data from reliable sources. We consulted several sectoral experts to finalise the parameters. We followed an iterative method and held follow-up discussions with the experts. The experts consulted in the process were from different organisations, including but not limited to Tata Power, Power System Operators, CEEW, Vasudha Foundation, Wood-Mackenzie, and Ember.

Selection of States

India’s clean electricity transition requires all states and Union Territories to transform their power sectors. More specifically, progress in states with high power demand is not only crucial but also urgent for India’s power sector to achieve a clean electricity transition. Therefore, to have structured boundaries for analysis, the report focuses on 16 states whose combined electricity demand constituted about 90% of India’s annual power requirement in the last three financial years. We calculated the power demand based on power supply position reports published by the Central Electricity Authority (CEA).¹

We shortlisted Delhi, Maharashtra, Uttar Pradesh, Gujarat, Chhattisgarh, Tamil Nadu, Rajasthan, Madhya Pradesh, Karnataka, Telangana, Andhra Pradesh, Punjab, Haryana, West Bengal, Odisha, Bihar for this analysis.

Data Collection

The report is a data-intensive study that required data collection, cleaning and validation for all 17 parameters for the selected 16 states. We used official government sources wherever possible. We used private data sources for parameters where data was unavailable from official sources. We provide the details of each parameter in Figure 3.

We rely on qualitative data for the fourth dimension, Policies and Political Commitments. Therefore, we have created data rubrics to capture the qualitative data in the best way possible. We provide the rubrics on a downloadable data sheet available on request.

To ensure uniformity in analysis, we used data for the financial year (FY) 2021-22 wherever possible. In cases where data for FY2022 was unavailable, we used the latest available data for all the parameters. Sectoral experts vetted the data used in this report.

Data Processing

In this analysis, we first calculated the performance of states on the various parameters based on their respective metrics. To do so, we normalised the parameters to a standard scale. We then consulted experts to give weightage to each parameter. We then estimated each dimension’s state-wise score as the weighted average of all the normalised parameter scores.

¹ CEA. Power Supply Reports. FY 22
We provide the metrics used for different parameters, the type of the indicator, the weightages and the data sources for each parameter in Figure 3. We provide a detailed description of how we did the scoring in Annexure 1: Methodology Details.

**Figure 3: Parameters, Weightages and Data Sources**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Weightages</th>
<th>Indicator Type</th>
<th>Mode of Measurement</th>
<th>Sources</th>
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<tbody>
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<tr>
<td>Renewable Energy Mix in State’s Power Supply</td>
<td>30</td>
<td>Progressive</td>
<td>Total generation (GWh) / Renewable energy generation (including large hydro) (GWh)</td>
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<td>Old Coal Power Capacity in Operation</td>
<td>20</td>
<td>Regressive</td>
<td>Current coal capacity / Current coal capacity above 25yrs of age</td>
<td>Global Energy Monitor Coal power plant tracker</td>
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<tr>
<td>Power Sector Emissions Intensity (gCO2e/GSDP)</td>
<td>20</td>
<td>Regressive</td>
<td>FY2022 emissions (kgCO2eq) / FY2022 GSDP (Rs in trillion)</td>
<td>Renewable Energy Generation Data Non-Renewable Energy Generation Data Emission Intensity Factors Reserve Bank of India (RBI) Handbook of Statistics</td>
</tr>
<tr>
<td>State Energy Efficiency Index (SEII)</td>
<td>15</td>
<td>Progressive</td>
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<td>The State Energy Efficiency Index 2020</td>
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<td><strong>Dimension 2: Performance of the Power System</strong></td>
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<tr>
<td>DISCOM Performance Rating</td>
<td>30</td>
<td>Progressive</td>
<td>NITI Aayog SECI Score</td>
<td>NITI Aayog</td>
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<td>Percentage of Outstanding Payments of DICOMs to Power Generators</td>
<td>25</td>
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<td>Total Volumes through GDAM till April 2022 (BUY+ SELL) / Total net short term till April 2022</td>
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<td>Shortage in power supply (MU)/ power requirement (MU)</td>
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<td>In-house data rubric with weightages given to data availability and % progress achieved against UDAY targets. Detailed split captured in the data file.</td>
<td>UDAY Portal</td>
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<td>In-house data rubric captured in data files</td>
<td>Banking Restrictions on Renewable Energy Projects in India</td>
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Source: IEEFA & Ember Analysis
Data-related challenges

For a few states, data was unavailable for some of the parameters, and it was challenging to source this from any alternate and reliable source. We present the reasonable assumptions that we made in Annexure 2: Data-related Challenges and Assumptions. We assigned an average value of the score for all states where data was available. We also give details about the data-related challenges in Annexure 2: Data-related Challenges and Assumptions.

State-level data analysis on coal gasification, use of carbon capture, usage and storage (CCUS) technology, captive power plants, round-the-clock power supply and other flexibility options is crucial. Therefore, we plan to expand the study and include more parameters in the next phase.