Overview on India’s Power Generation Capacity

What is the issue?

With the increasing demand for power and the lower marginal cost of installation, here is an overview of India’s generation capacity and the advantages to be exploited.

What is the present power generation capacity?

- India has been aggressively expanding its power generation capacity.
- The current installed capacity of 358 GW is about four times of what it was in 1997-98.
- This shows a doubling of capacity in each of the past two decades or about 75 MW per day.
- **Renewables** - In recent years, the major growth drivers have been renewable energy sources such as solar and wind power.
- Investments from the private sector have made a significant contribution to this.
- The private sector accounts for almost half the installed power generation capacity.
- For the last 3 years, growth in generation from renewables has been close to 25%.
- India aims to have the capacity of a renewable of 175 GW by 2022 and 500 GW by 2030.
- Solar and wind power plants would account for much of the targeted capacity from renewables.

Why do thermal plants still persist?

- Today, thermal generation capacity accounts for about two-thirds the installed generation capacity in the country.
- So, despite the increasing awareness about the environmental impact of fossil fuels, the reliance on thermal plants is unlikely to end any time soon.
- Thermal plant capacities are large and therefore targeted capacity additions can be achieved by constructing fewer such plants.
- In contrast, on average, it would take 18 solar or wind projects to generate the same quantity of power as one thermal plant.

What are the challenges to renewables installation?

- Given the above, switching from fossil fuel to renewables will remain challenging.
- The administrative overheads that would have to be incurred in setting up the multiple projects could significantly add to the cost.
- Also, infrastructure projects have an inverse relationship between size and unit cost, indicating economies of scale.
- As the capacity of power plants increases, the average cost of power per MW reduces.
- Notably, the average cost per MW for a thermal plant is about 25% lower than that of a solar plant.
- So, this cost advantages that large thermal plants enjoy today should be overcome.
- This calls for developing larger solar and wind power plants that can also exploit similar economies of scale.

What has the private investments' role been?

- Over the last two decades, 63% of the total planned generation capacity has come from the private sector.
- Private investment has been even more pronounced in renewables.
- They account for almost 90% of investment in wind and solar projects.
- Private sector plants have an average cost per MW that is 12-34% lower for all categories except solar.
- Lower capacity cost has a direct impact on electricity tariffs.
- Electricity tariffs broadly consist of two components - fixed capacity costs and operation and maintenance costs, which include fuel expenses.
- In general, capacity costs account for more than 90% of the levelised cost of electricity, irrespective of the fuel type.
- [Levelised Cost of Electricity (LCOE) is a means of comparing generation technologies, by considering the cost of the electricity that comes out over its lifetime.]
- So, creating additional capacity at lower cost will play a big role in keeping electricity tariffs low.
- In all, private investment in the power sector has helped in augmenting capacity as well as helped in lowering cost.

What has brought down the installation cost?

- Even as total capacity in generation has been growing, the cost of installing additional capacity has fallen.
- The reasons for the decline could be as follows:

- **Advances in technology** have resulted in the construction of larger power plants.
- Compared to the 15-year period before 2013, power plants installed in the past 6 years have on average been significantly bigger.
- The economies of scale in power generation appear to have been dramatic.
- **Private sector investment**'s increasing share is another reason.
- The share of private sector in capacity creation has been 70% in the last decade as compared to 46% in the decade before that.
- As discussed above, private sector capacity has lower costs.

What is the way forward?

- With economic growth, the demand for power in India is only going to increase further.
- It is imperative for India to create power generation assets with the lowest unit cost by optimising plant capacities and encouraging private sector investment.
- Declining marginal cost for capacity provides opportunities for replacing existing capacity with newer capacity that are more efficient.

Source: The Hindu

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