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Aging Thermal Power Plants: Way Forward

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This article is based on **Revisit the idea of 'aging out' India's coal plants**, which was published in The Hindu on 09/08/2021. It talks about the idea of retiring old coal based power plants and the future implications.

As part of the Union Budget address for 2020-21, the Union Finance Minister said that the **shutting down of old coal power plants**, which are major contributors to emissions, will aid the achievement of India's **Nationally Determined Contributions**.

Since plants older than 25 years make up around 20% of the total installed thermal capacity in the country and play a significant role in the country's power supply, decisions regarding their retirement merit finer scrutiny to see if the claimed benefits really accrue.

Advantages of Shutting Down

- **Economic Advantage:** It is argued that the availability of under-utilised newer (and presumably more efficient) coal-based capacity means that shutting down older inefficient plants would lead to **improved efficiencies, reduced coal usage, and hence, cost savings.**
- **Difficulty in Pollution Control mechanism:** It would be uneconomical for old plants to install **pollution control** equipment required to meet the emission standards announced by the Ministry of Environment, Climate change and Forest and hence it would be better to retire them.
- **Decline in Land Degradation:** Untreated air and water pollutants from coal power plants, especially older ones affect the water and the flora and fauna of adjoining areas making them unfit for living or livelihood activities.
- **Shutting down old coal-based power plants** and freezing those under construction can save over Rs. 1.45 lakh crore at a time when electricity demand has been hit due to **Covid-19.**

The savings will **accrue from avoiding retrofitting old plants** to reduce the toxicity from their emissions.

- Replacing electricity from older coal plants with **cheaper renewable sources** will reduce the gap between cost of supply and revenue generation for discoms.

Risks Associated with Shutting Down

- **Not Much Saving:** Analysis suggests that the total savings in generation cost from shutting down plants older than 25 years would be less than Rs. 5,000 crore annually, which is just 2% of the total power generation cost.
 - These savings may not be sufficient to even pay for the fixed costs (such as debt repayment) that would have to be paid anyway, even if the plants are prematurely retired.
 - Similarly, savings in coal consumption by replacing generation from plants older than 25 years with newer coal plants are also likely to be only in the 1%-2% range.
- **Environmental Benefits of Some Old Plants:** There are some old plants that may continue to be economically viable even if they install pollution control equipment, as their current fixed costs (which would increase with pollution control equipment installation) are very low.

Moreover, about half the coal capacity older than 25 years has already issued tenders for pollution control equipment installation.
- **Need of Power Sector:** There is lack of power availability in India, and the limited savings associated with early retirement of coal plants may not be worth the risks.
 - To support the growing intermittent renewable generation in the sector, there is an increasing need for capacity that can provide **flexibility, balancing, and ancillary services**.
 - Old thermal capacity, with lower fixed costs, is a prime candidate to play this role until other technologies (such as storage) can replace them at scale.
 - Further, the capacity value of the old capacity is critical to meet instantaneous peak load, and to meet load when renewable energy is unavailable.
- **Political Economic Risk:** Aggressive early retirement of coal-based capacity, without detailed analyses, could result in real or perceived electricity shortage in some States, leading to calls for investments in coal-based base-load capacity by State-owned entities.
 - About 65 gigawatts (GW) of thermal capacity is already in the pipeline, of which about 35 GW is in various stages of construction.
 - This is likely in excess of what the country needs, and further addition to it, driven by State political economy considerations, will lead to stranded assets and locked-in resources.

- **More Analysis And Research Required Before Final Decision:** Using age as the only lever to drive these decisions is too blunt an instrument, and can prove counterproductive.
 - Instead, a more disaggregated and nuanced analysis, considering the various technical, economic and operating characteristics of individual plants and units, while also accounting for aspects such as intermittency of renewables, growing demand, and need to meet emission norms, would be appropriate to make retirement-related decisions.
 - E.g.
 - For instance, plants such as **Rihand, Singrauli** (both Uttar Pradesh), and **Vindhyanchal** (Madhya Pradesh), are all over 30 years old and have very low generation costs of around ₹1.7/kWh, which is lower than the national average.
 - This may be due to **locational advantage rather than efficiency**, as older plants are likely to be located closer to the coal source, reducing coal transport costs. However, this just highlights the complexity of the issue, since efficiency does not naturally translate to savings.

Way Forward

- **Strategic Decommissioning of Old and Inefficient Power Plants:** It may be prudent to let old capacity fade away in due course and saving some of them as they are efficient, while focusing on such detailed analysis and weeding out the needless capacity in the pipeline, to derive long-term economic and environmental benefits.
- **Cost Effective Solar Plants:** The average cost of coal-fired projects is Rs.4 per unit and generally sees an upward escalation, whereas new solar power plants are being bid out at less than Rs.3 per unit.
- **Encourage Private Sector:** New private competition can bring new capital and more innovation.

New coal-fired power plants are still being financed so that the private sector is not building any coal-based power plants at all; only the public sector power companies are doing so. These PSU thermal plants are financed by public sector banks and largely on taxpayers' money.
- **UDAY 2.0:** Government's announcement of the launch of UDAY 2.0 which seeks installation of smart prepaid meters, prompt payment by discoms, making coal available for short term and reviving gas-based plants is a step in the right direction.
- **Flexible Contracts:** Long-term supply contracts need flexibility for public utilities to adapt to unforeseen situations such as a Covid collapse in demand.

Conclusion

We need an **energy transformation** through which we would realise the co-benefits of local and global emission reduction. We also need the right to energy for all, as energy poverty and inequity is not acceptable.

Diversified energy mix is what India needs to focus on, no doubt solar and wind have a lot of potential, Hydrogen would also be a game changer in Indian energy transition space.

Drishti Mains Question

Critically analyse the government's steps of shutting down old coal power plants in order to achieve India's Nationally Determined Contributions.
