An Endgame for New Coal Power Projects?

Why in news?

An expert committee appointed by the Union Power Ministry has tabled a plan to stop new coal-fired capacity additions following India's pledge at COP 26 to have net zero emissions by 2070.

What are the key findings of the committee?

- The committee was headed by former Central Electricity Authority (CEA) chairman Gireesh Pradhan.
- **Renewables-** It has found that the addition of low-cost renewable energy capacity would handle the expected growth in electricity demand.
- It emphasis on accelerating the decarbonisation of India's power system and recommends technologies that could operate flexibly to support integration of 450GW of variable renewables (VRE) by 2030.
- **Underutilisation of coal fleets**- It also found the overall coal fleet was underutilised, averaging 55% capacity utilisation.
- **Integration**- Power storage such as batteries and pumped hydro, aligned with conventional thermal (gas and coal) and hydro units could operate as peakers to provide energy to the grid.

How do flexible generation sources integrate?

- Flexible generation is characterised by the ability to quickly start up, rapidly ramp up and ramp down the generation, then just as quickly shut down.
- **Gas-fired power plants**- Combined Cycle Gas Turbines (CCGT) in general rate better on flexibility parameters with quicker ramp up and ramp down rates and minimum generation levels.
- CCGT plants can ramp up net generation at 12% per minute compared to coal and lignite, 9% and 8% for respectively.
- CCGT plants can operate at a minimum load of 30% compared to coal and lignite, 10% and 20% for respectively.
- The lack of a domestic gas supply has limited the 25GW of gas-fired capacity to extremely low utilisation, below 20%.
- **Batteries-** In terms of flexibility, battery storage is the most proven technology to provide fast ramp-up and ramp-down energy dispatch and fast frequency service.
- Batteries ramp-up to full load in a minute and can also absorb excess power from the grid.
- Continuing a decade-long deflation in costs, solar plus batteries are cost competitive with new coal-fired plants in markets such as the US and Australia.
- In India, new projects backed by tenders from government-owned entities such as NTPC and Solar Energy Corporation of India (SECI), are executed.
- The government is striving to support the localisation of batteries' value-chain with a Production Linked Incentive (PLI) scheme for 50GWh of battery storage for electric vehicles (EVs) and stationary battery storage.
- The local manufacture could reduce the cost of batteries.

What is the key for transitioning to a modern and cost-effective power economy?

- Optimised power assets, both energy and grid services, is essential for transitioning to a modern and cost-effective power economy.
- Coal and gas-fired power with favourable cost economics could be retrofitted to operate flexibly, enabling a diversified pool of assets to compete to provide energy and grid ancillary services.
- Flexibility can be induced by
    - Regionally co-optimising energy and ancillary services
    - Simultaneously creating two different value (revenue) streams
    - Bringing down system level cost
    - Potentially driving investment into the assets that could provide flexibility

Reference

1. https://www.thehindubusinessline.com/opinion/is-the-indian-government-seriously-considering-the-endgame-for-new-coal-power-projects/article64941620.ece