Reducing Emissions from Coal-Based Power Sector

Why in News

Recently, in a webinar by think-tank **Centre for Science and Environment (CSE),** experts discussed the measures to **reduce carbon dioxide (CO_2)** footprints of **India's coal-based power sector.**

- **Centre for Science and Environment (CSE)** is a public interest research and advocacy organisation based in New Delhi.
- CSE researches into, lobbies for and communicates **the urgency of development that is both sustainable and equitable.**

Key Points

Power Generation in India:

- India mainly uses **three types** of thermal power plants- **Coal, Gas and Liquid-fuel based.**
- The electricity generated by these plants adds up to **62.2%** of the total power generation in the country.

Fuel	MW	% of Total
Total Thermal	2,31,456	62.2%
Coal	1,99,595	53.7%
Lignite	6,360	1.7%
Gas	24,992	6.7%
Diesel	510	0.1%
Hydro (Renewable)	45,699	12.3%
Nuclear	6,780	1.8%
RES* (MNRE)	88,042	23.7%
Total	**371,977**	

- **Emissions from coal-based Power Sector:**
  - India's coal-based thermal power sector is one of the **country's biggest emitters of CO_2.**
  - It emits **1.1 giga-tonne of CO_2 every year;** this is **2.5%** of global **GreenHouse Gas (GHG)** emissions, one-third of India's **GHG** emissions, and around **50%** of India's fuel-related CO_2 emissions.

- **Policies Needed to Reduce Emissions:**
  - **Improving fleet technology and efficiency, renovating and modernising:**
    - India has one of the youngest coal-based thermal plants in the world, with around **64% of the capacity (132 GW) less than a decade old.**
    - The government's renovation and modernisation policies need to play a key role in maintaining the efficiency of this fleet.
  - **Planning for the Old Capacity:**
    - In 2015, over **34 GW capacity** in India was more than 25 years old, and **60% of it was highly inefficient.**
    - **Increasing India's renewable electricity generation** can help further the cause to accelerate the retirement of old and inefficient plants.
  - **Propagating Biomass Co-firing:**
    - **Biomass co-firing** stands for adding biomass as a partial substitute fuel in high efficiency coal boilers.
      - **Coal and biomass are combusted together in boilers** that have been designed to burn coal. For this purpose, the existing coal power plant has to be partly reconstructed and retrofitted.
      - Co-firing is an option to **convert biomass to electricity, in an efficient and clean way, and to reduce GHG emissions of the power plant.**
    - Biomass co-firing is a globally accepted **cost-effective method** for **decarbonising** a coal fleet.

      Decarbonising means reducing carbon intensity, i.e. reducing the emissions per unit of electricity generated (often given in grams of carbon dioxide per kilowatt-hour).
    - India is a country where biomass is usually burnt on the field which reflects apathy towards resolving the problem of clean coal using a very simple solution that is readily available.
  - **Investing in Carbon Capture and Storage (CCS):**
    - Globally, carbon capture and storage has struggled to pick up and India's prospects appear to be dim at least until 2030.
    - Businesses should invest in indigenous research and development to bring down the costs of CCS.
  - **Coal Beneficiation:**

    Coal Beneficiation is a process by which **the quality of raw coal is improved** by either reducing the extraneous matter that gets extracted along with the mined coal or reducing the associated ash or both.

- **Other Initiatives to Reduce Emissions:**
  - India shifted from **Bharat Stage-IV (BS-IV) to Bharat Stage-VI (BS-VI)** emission norms from 1st April 2020 which was earlier to be adopted by 2024.
  - It has distributed more **than 360 million LED bulbs under the UJALA scheme**, which has led to energy saving of about 47 billion units of electricity per year and reduction of 38 million tonnes of CO_2 per year.
  - **International Solar Alliance**: It is an Indian initiative conceived as a **coalition of solar-resource-rich countries** (which lie either completely or partly between the tropic of Cancer and the tropic of Capricorn) to address their special energy needs.
  - **The National Action Plan on Climate Change (NAPCC)** was launched in 2008 which **aims at creating awareness among the representatives of the public,** different agencies of the government, scientists, industry and the communities on the threat posed by climate change and the steps to counter it.

Way Forward

- **Renewable capacity** addition alone cannot be enough; ambitious plans to **reduce GHG emissions in the coal sector are equally needed** to meaningfully tackle climate change.
- 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.

Source:DTE