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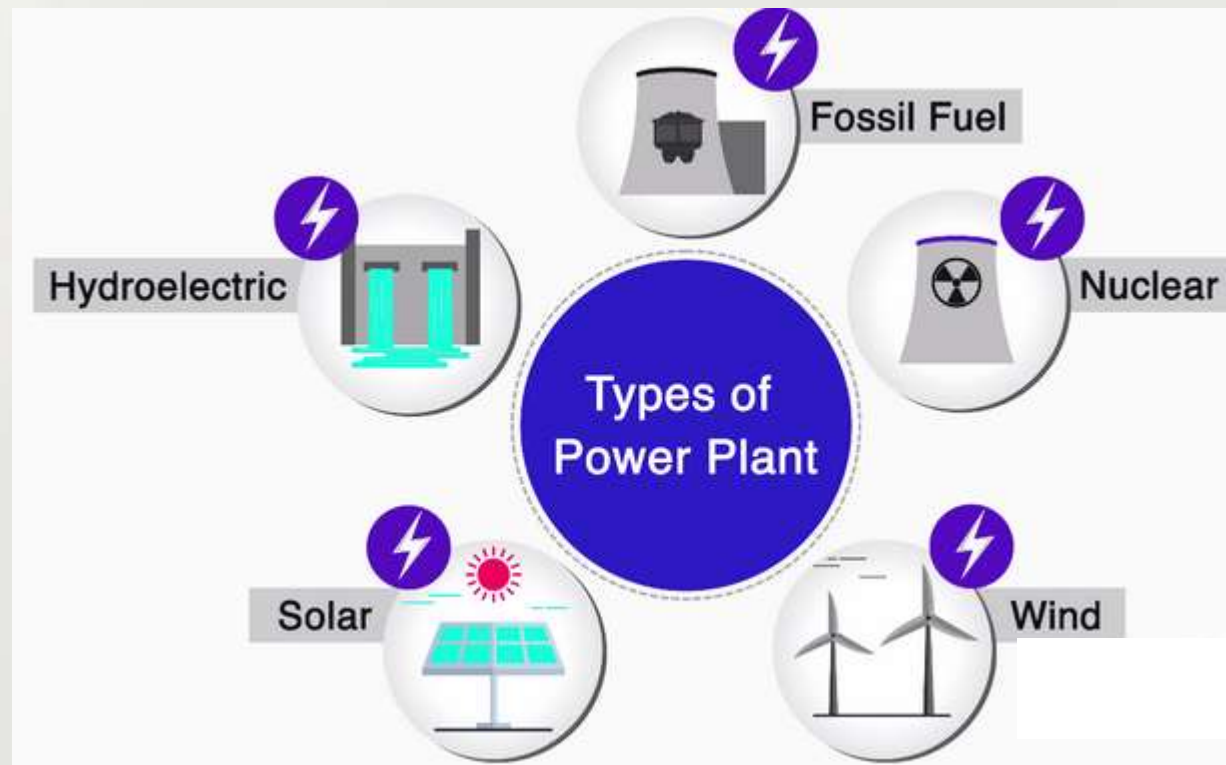


COAL-BASED THERMAL POWER PLANTS EMISSION NORMS COMPLIANCE



Why in News?

- Centre for Science and Environment (**CSE**)-a **Environmental NGO**
- **assessed** the **status of compliance of coalfired thermal power plants (TPP)** with **SOx emission** norms.



Sources of Electricity in India
By Installed Capacity

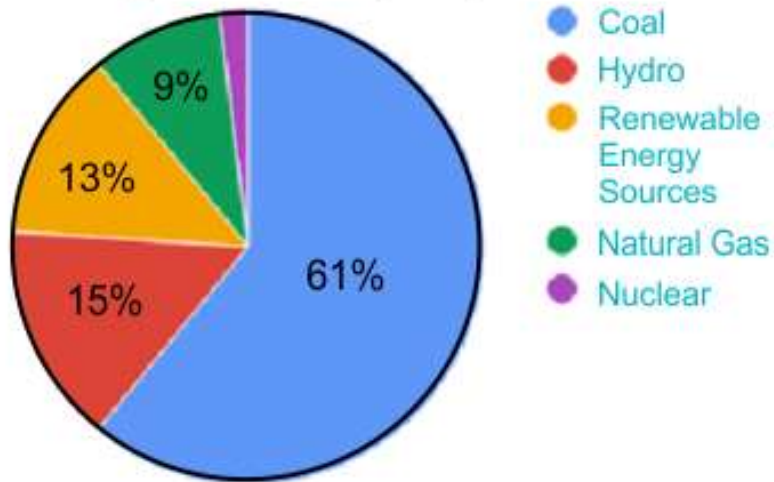


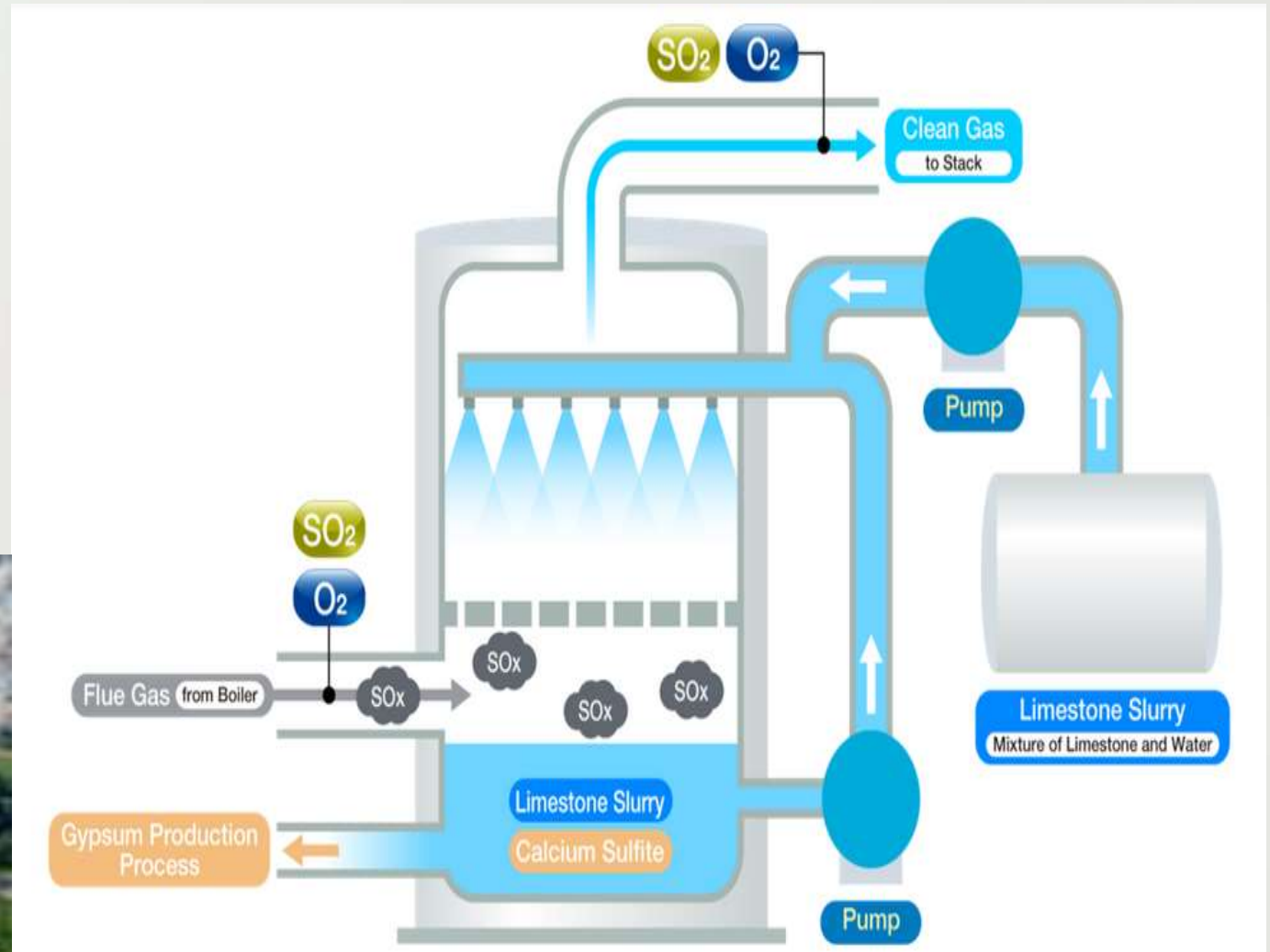
Fig 1 :Types of power plants

Burning fossil fuels at **power plants creates emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), particulate matter (PM), carbon dioxide (CO_2), mercury (Hg), and other pollutants.**

CSE had done assessment based on installation of Flue Gas Desulphurization (FGD)

Flue Gas Desulphurisation (FED):

- **Removal of Sulfur Dioxide** is called as Flue-gas Desulphurization (FGD).



Flue Gas Desulphurisation (**Wet scrubber**)



Sulphur dioxide (SO₂)

- It is a **toxic gas** with a **pungent, irritating smell**.

Sources of sulphur dioxide

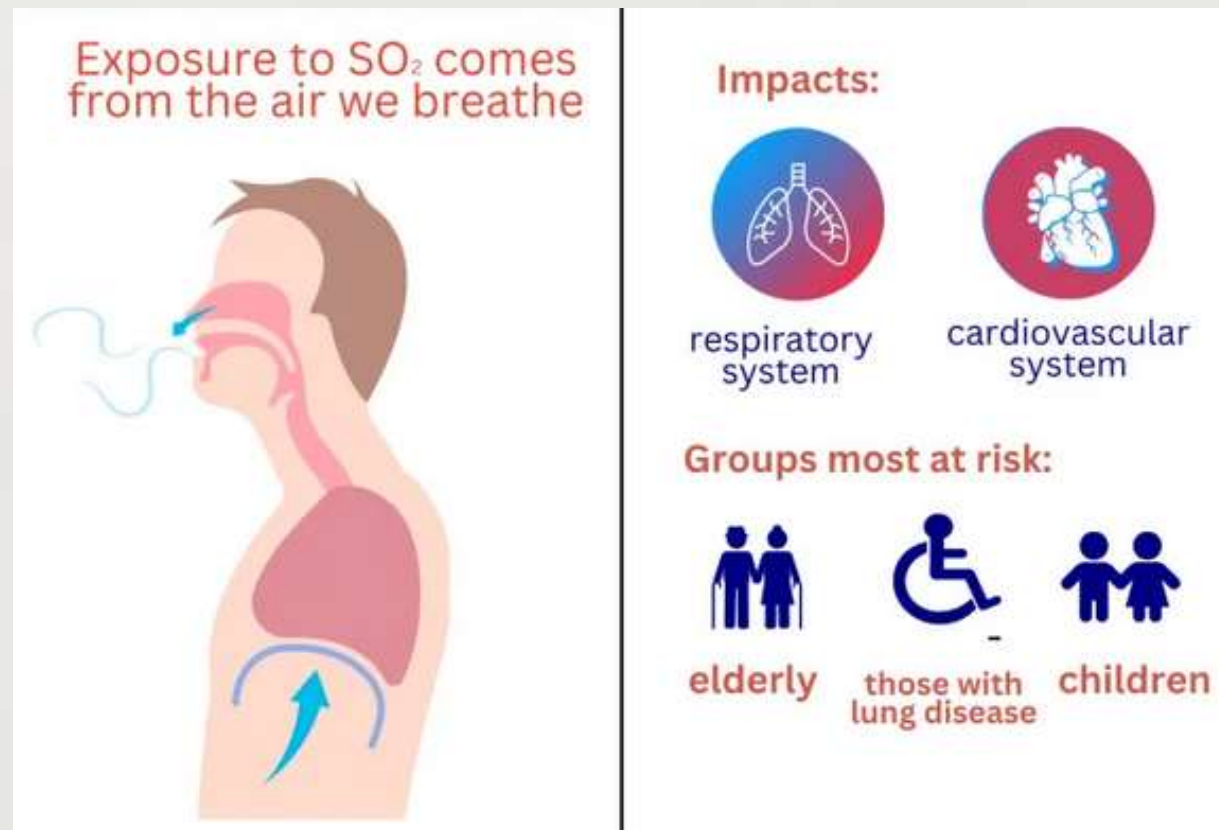
- The **largest source** of is the **burning of fossil fuels** by power plants
- **Smaller sources** of SO₂ : **industrial processes**; and **locomotives** (train), **ships** and other **vehicles** and **heavy equipment** that burn fuel with a high sulfur content.
- It is released **naturally** by **volcanic activity**.



Impact of Sulphur Dioxide

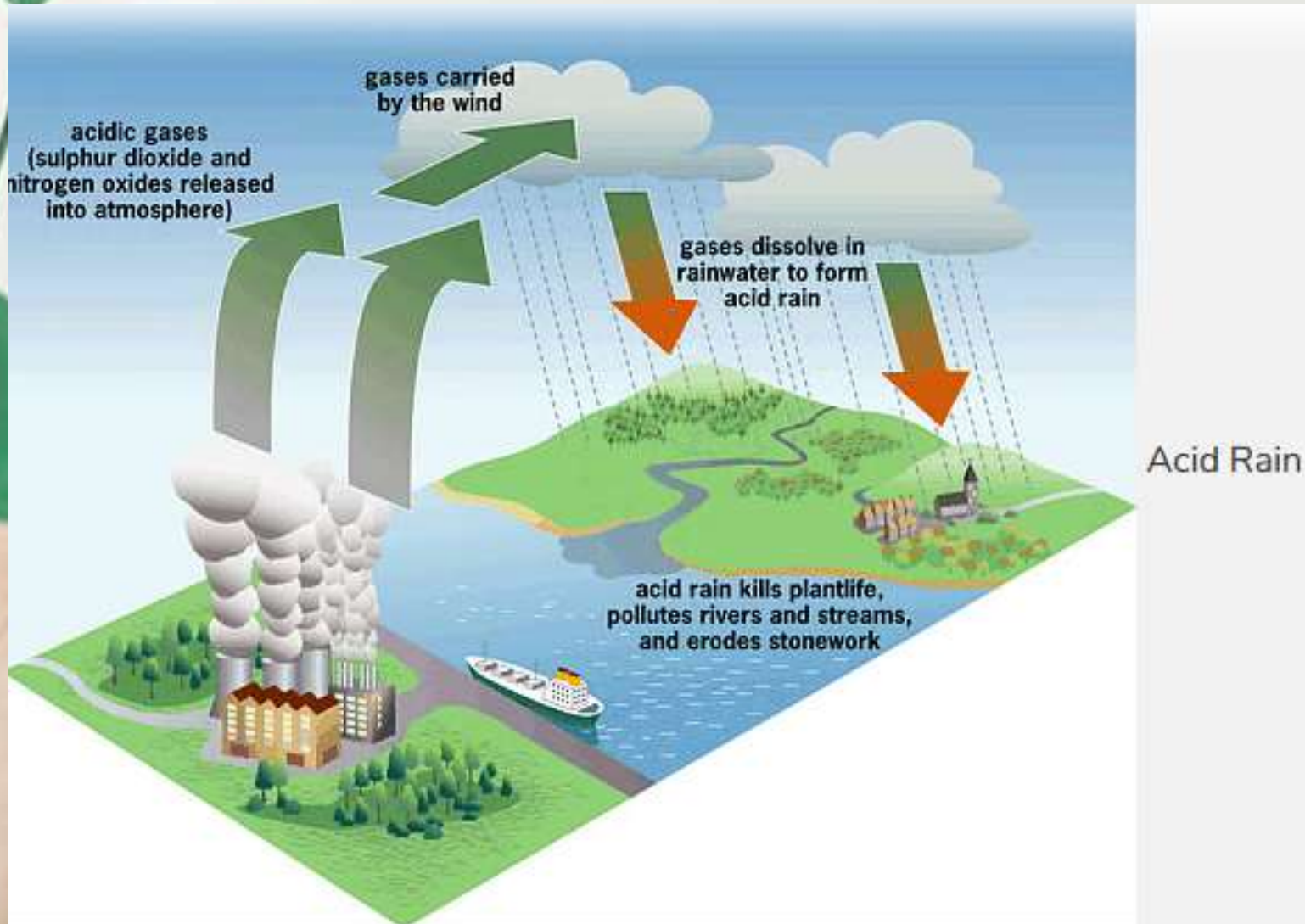
Health effects:

- Inhaling sulphur dioxide is associated with increased **respiratory symptoms** and death.
- It also **weakens** the functioning of certain **nerves**.



Environment impact of Sulphur Dioxide

- It contributes to **acid rain**.





Emission Norms for Thermal Power Plants

- **In 2015**, Ministry of Environment, Forest and Climate Change (MOEFCC) **first time introduced** environmental **emission standards** for controlling **SO₂, NO_x & Mercury** emissions **from coal-based TPPs** under the Environment (Protection) Act, 1986.

Three Categorization with three different deadlines

Category	Location/area	Changed Deadlines
Category A	Within a 10-km radius of Delhi-NCR and cities population more than 10 Lakh	December 31, 2022 to December 31, 2024.
Category B	10-km radius of critically-polluted areas or non-attainment cities (those cities failed to meet the National Ambient Air Quality Standards)	December 31, 2023 to December 31, 2025.
Category C	For all other power plants	December 31, 2024 to December 31, 2026.



In 2021, government extended the timelines for the majority of coal-based power plants in India.



Findings of Centre for Science and Environment (CSE)

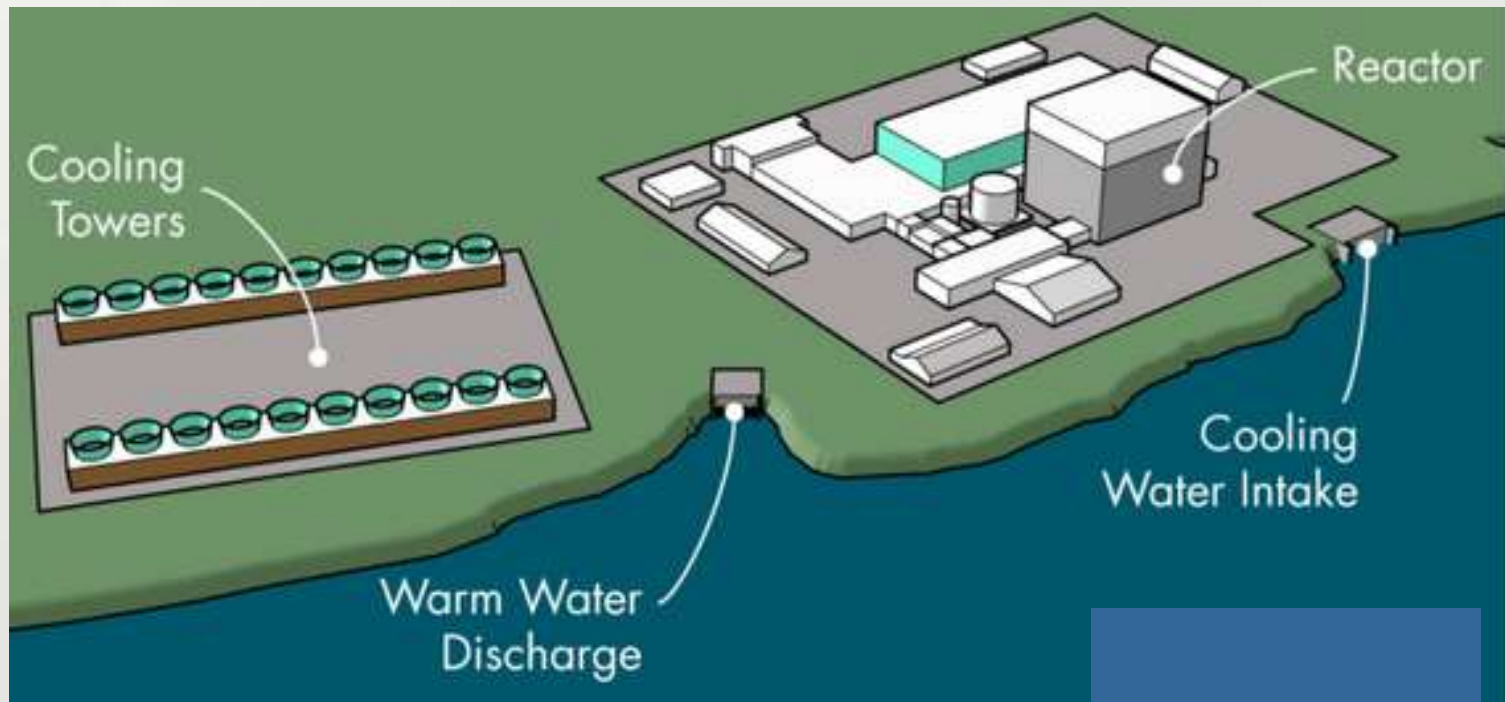
Only 5% of the coal power capacity has complied with emission norms so far.

17% of overall coal power capacity was still at very initial stages of compliance.

India is the largest emitter of SO₂

Other guidelines

- On water use: **All power plants with Once Through Cooling (OTC) shall install Cooling Tower (CT).**
- **Once-through cooling (OTC) systems transfer heat to a continuously running supply of cold water,**



Use of beneficiated coal: Its aim is **to minimize flyash** generation.

- **Coal beneficiation** is a process through which **inorganic impurities (volatile matter or ash)** separated from raw coal.
- **Each TPPs** generating station **should achieve 100% utilisation of total ash** generated at plant.



Composition of coal ash

Components	Composition (wt %)
SiO ₂	18.9
Al ₂ O ₃	15.2
Fe ₂ O ₃	10.6
Na ₂ O	0.988
CaO	1.18
K ₂ O	2.23
TiO ₂	0.468
SO ₃	0.366
MgO	0.348
SiO ₂ /Al ₂ O ₃	1.2

- **Minor constituents include:** arsenic, beryllium, boron, cadmium, chromium, hexavalent chromium, cobalt, **lead**, manganese, **mercury**, molybdenum, selenium, strontium, thallium, and vanadium, etc

Challenges in meeting New Standards

- **High investment:** As per CSE estimate, **around one lakh crore** (in 2020) required **to achieve emission norms**. Money is required for hiring skilled manpower, equipment, etc.

- **Import of Pollution Control Technologies (PCTs) equipment:**

Certain components of FGD are not manufactured in India

Also due to deadlines there is lack of time for developing indigenous manufacturing facility in the country.

- **Impact of COVID-19 pandemic:** It **delayed the entire process** of planning, tendering and implementing the Flue Gas Desulphurisation (FGD).
- **Meagre penalty for violating emission norms:** Power plant continues to function even if they are failing to achieve emission norms.



Suggestions

- **Collaboration:**

Central Electricity Authority and Ministry of Power should work in tandem and **ensure that thermal power plants implement norms that are good for environment** as well as the health of people.

- **Emission Data:**

Stakeholders must publish transparently about emission data and their impact to immediate vicinity of TPPs for public research and scrutiny.

- **Provide** one year **grant or subsidy** scheme:

This can be done to expedite the implementation of the norms **to enable fund-raising** for the high upfront costs.

- **Removal of tax levied on imported Pollution Control Technologies (PCTs):** Tax benefits will encourage TPPs to utilize and import the technologies.



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