

## Flue Gas Desulphurisation (FGD) Technology

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The Ministry of Power reviewed an IIT-Delhi study that challenged need for Flue Gas Desulphurisation in thermal power plants.



[Ref: DTE]

### **About FGD Technology:**

- **Flue Gas Desulphurisation** technology is essential for removing **Sulfur Dioxide (SO<sub>2</sub>)** from exhaust emissions.
- Burning fossil fuels like coal and oil produces flue gas with high SO<sub>2</sub> content.
- Approximately **95%** of the sulfur in these fuels converts to SO<sub>2</sub> during combustion.
- The Ministry of Environment, Forest & Climate Change has mandated FGD systems for all coal-based TPPs. FGD technology is crucial for maintaining a clean and safe environment.
- There are three major types of FGD systems used globally:
  1. **Dry Sorbent Injection:** Uses limestone to remove SO<sub>2</sub>.
  2. **Wet Limestone Based:** Utilizes a slurry of water and limestone.
  3. **Sea Water Based:** Employs sea water for SO<sub>2</sub> removal.
- FGD systems are highly efficient, capable of removing over **90%** of SO<sub>2</sub> from flue gas emissions.

### **FGD Process:**

- The FGD process involves the use of **absorbents to eliminate SO<sub>2</sub>** from flue gas.
- Common absorbents include **ammonia, sodium sulfite, lime, or limestone slurry**.
- The process is typically carried out in a **scrubber tower (absorber tower)**.
- The uncleaned flue gas is sprayed with a **scrubbing slurry**, a mixture of water and limestone.
- A chemical reaction occurs, **bonding most of the SO<sub>2</sub>**, effectively removing up to **95%** of the sulfur dioxide.

### **About SO<sub>2</sub>:**

- SO<sub>2</sub> is a toxic gas produced by **burning fossil fuels** containing sulfur.

- It is a **major air pollutant** affecting **human health and the environment**.
- It is a precursor to acid rain, which damages **forests, freshwater, soils, insects, aquatic life, and man-made structures**.

#### **Environmental and Health Implications:**

- **Acid rain**, resulting from  $\text{SO}_2$ , leads to the corrosion of steel structures such as **bridges** and the **weathering of stone buildings and statues**.
- $\text{SO}_2$  is also detrimental to **human health**, primarily affecting the **respiratory system**.