



## Extension of Sulfur Dioxide Emission Norms

**For Prelims:** Sulfur Dioxide Pollution and its impact, Flue-gas Desulphurization.

**For Mains:** Need to focus on mitigating the hazards of air pollution in India.

### Why in News?

The Ministry of Power (MoP) has extended the deadline for [coal-fired power plants](#) to [install Flue Gas Desulphurisation \(FGD\)](#) to cut **sulphur emissions by two years**.

### What is the Background?

- India had initially set a **2017 deadline for thermal power plants to install FGD** units to cut Sulphur emissions.
  - Removal of Sulfur Dioxide is called Flue-gas **Desulphurization (FGD)**.
  - It seeks to remove gaseous pollutants viz.  $\text{SO}_2$  from exhaust flue gases generated in furnaces, boilers, and other industrial processes due to thermal processing, treatment, and combustion.
- The deadline was later changed to **varying deadlines for different regions, ending in 2022**, and further extended last year to **a period ending 2025**.
- Power plants will be forcibly retired if they do not comply to norms on sulphur emissions by end-2027.
- Plants near populous regions and the capital New Delhi will have to pay penalties to operate from end-2024, while utilities in less polluting areas **will be penalized after end-2026**.
- Higher costs, lack of funds, Covid-19 related delays and geopolitical tension with China, which has restricted trade, are cited as the reasons for the extension.

### Why is the installation of FGD Units Important?

- Indian cities have some of the world's most polluted air. India currently emits almost **twice the amount of  $\text{SO}_2$  than** the next highest country, **Russia**.
- Thermal utilities, which produce 75% of the country's power, account for some 80% of industrial emissions of sulphur and nitrous-oxides, **which cause lung diseases, acid rain and smog**.
- Every single day delay in implementation of prescribed norms and not installing the FGD system is causing **huge health and economic damage to our society**.
- The high levels of damaging  $\text{SO}_2$  pollution in India are avoidable much sooner as **flue-gas desulphurisation systems have proved successful in reducing emission levels in China**, the country responsible for the highest level in 2005.

### What is Sulfur Dioxide Pollution?

- Source:**
  - The largest source of  $\text{SO}_2$  in the atmosphere is the **burning of fossil fuels by power plants** and other industrial facilities.

- Smaller sources of SO<sub>2</sub> emissions include: **industrial processes** such as extracting metal from ore, natural sources such as **volcanoes, and locomotives**, ships and other vehicles and heavy equipment that burn fuel with a high sulfur content.
- **Impact: SO<sub>2</sub> can affect both health and the environment.**
  - Short-term exposures to SO<sub>2</sub> can **harm the human respiratory system** and make breathing difficult. People with asthma, particularly children, are sensitive to these effects of SO<sub>2</sub>.
  - WHO has estimated that it causes **4.2 million deaths globally per year.**
  - SO<sub>2</sub> emissions that lead to high concentrations of SO<sub>2</sub> in the air generally also lead to the formation of other sulfur oxides (SO<sub>x</sub>). SO<sub>x</sub> can react with other compounds in the atmosphere to form small particles. These particles contribute to [Particulate Matter \(PM\) pollution](#).
    - Small particles may penetrate deeply into the lungs and in sufficient quantities can contribute to health problems.
  - It can also **cause acid rain** which leads to widespread environmental damage.
- **India's Case:**
  - India's sulphur dioxide (SO<sub>2</sub>) emissions recorded a significant decline of approximately 6% in 2019 compared to 2018, the steepest drop in four years, according to a report from **Greenpeace India and the Centre for Research on Energy and Clean Air (CREA)**.
    - However, India remained the largest emitter of SO<sub>2</sub>.
  - [Air Quality sub-index](#) has been evolved for eight pollutants (PM10, PM2.5, NO<sub>2</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, NH<sub>3</sub>, and Pb) for which short-term (upto 24-hours) National Ambient Air Quality Standards are prescribed.

## UPSC Civil Services Examination Previous Year Question (PYQ)

### Prelims

#### Q1. Why is there a concern about copper smelting plants?

1. They may release lethal quantities of carbon monoxide into environment.
2. The copper slag can cause the leaching of some heavy metals into environment.
3. They may release sulphur dioxide as a pollutant.

Select the correct answer using the code given below.

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

Ans: (b)

Exp:

- There are several different processes that can be used for copper production. One of the traditional processes is based on smelting in Reverberatory furnaces (or electric furnaces for more complex ores), producing matte (copper-iron sulphide). The matter from the furnace is charged to converters, where the molten material is oxidized in the presence of air to remove the iron and sulphur impurities (as converter slag) and to form blister copper.
- The principal air pollutants emitted from the process is **sulphur dioxide and particulate matter** and the main portion of the solid waste is discarded slag. **Hence, statement 3 is correct.**
- The slag produced can contain significant concentrations of a number of potentially toxic elements including arsenic, lead, cadmium, barium, zinc, etc. The slag can release these potentially toxic elements into the environment under natural weathering conditions and cause pollution of soils, surface waters and groundwater. **Hence, statement 2 is correct.**
- As slag is considered chemically inert, it is mixed with cement and is used to construct roads and railroad beds. It is also used for sandblasting. Moreover, it is also added to roofing shingles.
- Copper smelting does not release lethal quantities of carbon monoxide into the environment.

Hence, statement 1 is not correct.

- Therefore, option (b) is the correct answer.

**Q2. With reference to furnace oil, consider the following statements:**

1. It is a product of oil refineries.
2. Some industries use it to generate power.
3. Its use causes sulphur emissions into environment.

**Which of the statements given above are correct?**

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (d)**

**Exp:**

- Furnace oil or fuel oil is a dark viscous residual product of crude-oil distillation. It is used as a fuel in different types of combustion equipment. The emissions of oxides of sulphur are a direct result of the sulphur content of the fuel oil. **Hence, statements 1 and 3 are correct.**
- Applications of Furnace oil:
  - Marine engines and slow speed engines for power generation,
  - Drying tea leaves,
  - Gas turbines for power generation,
  - Feed stock for fertiliser manufacturing,
  - Thermic fluid heaters and hot air generators. **Hence, statement 2 is correct.**
- **Therefore, option (d) is the correct answer.**

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### **Mains**

**Q1.** Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve revised standards? **(2021)**

**Q2.** Environmental Impact Assessment studies are increasingly undertaken before a project is cleared by the Government. Discuss the environmental impacts of coal-fired thermal plants located at coal pitheads. **(2014)**

**Source: IE**