



# Fly Ash

## Why in News?

Recently, the Union Ministry of Environment, Forests and Climate Change (MoEF&CC) clarified the **compliance dates for the complete utilisation of fly ash for Thermal Power Plants (TPP)** in a new notification.

## What is Fly Ash?

### ▪ About:

- Fly ash is an **unwanted unburnt residue of coal combustion in a coal thermal power plant.**
- It is **emitted along with flue gases** during the burning of coal in a furnace and collected using the electrostatic precipitators.
- The **fly ash collected with the help of precipitators is converted into a wet slurry** to minimise fugitive dust emissions.
- It is then transported to the scientifically designed ash ponds through slurry pipelines.

### ▪ Composition:

- Composition of fly ash **depends upon the composition of coal being burnt.** It may contain Beryllium, Arsenic, unburnt Carbon, Silicon Oxides, Dioxins, aluminium oxide, ferric oxide, calcium oxide, etc.
  - These elements are **severe environmental pollutants.**

### ▪ Properties:

- Resemble Portland cement **but is chemically different.**
  - Portland cement is a binding material in the form of a finely ground powder that is manufactured by burning and grinding a mixture of limestone and clay.
  - Its chemical composition includes calcium silicates, calcium aluminate and calcium aluminoferrite.
- Exhibit cementitious properties.
  - A cementitious material is one that hardens when mixed with water.

### ▪ Uses: It is **used in concrete and cement products, road base, metal recovery,** and mineral filler among others.

- ### ▪ Harmful Effects: Fly ash **particles are toxic air pollutants.** They can trigger heart disease, cancer, respiratory diseases and stroke.
- When combined with water they cause leaching of heavy metals in ground water.
  - It also pollutes the soil, and affects the root development system of trees.
  - Gross under-utilisation of this by-product over the years has led to the accumulation of 1,670 million tonnes of fly ash according to the Summary of Ash Generation and Utilisation during 2020-2021 by the Joint Committee earlier constituted by the NGT.

### ▪ Related Initiatives:

- Earlier in 2021, [National Thermal Power Corporation \(NTPC\)](#) Limited had invited [Expression of Interest \(EOI\)](#) for sale of fly ash.
- NTPC has also **collaborated with Cement manufacturers around the country to supply Fly Ash.**
- [Pradhan Mantri Awas Yojana \(Urban\)](#) has focused on new construction technologies such as using fly ash bricks that are innovative, and environmentally friendly.
  - Even state governments have come out with their Fly ash utilisation policies, e.g.,

Maharashtra was the first state to adopt the policy.

- A web portal for monitoring of fly ash generation and utilisation and a mobile based application titled **“ASHTRACK”** has been launched by the Government.
- **Goods and Services Tax (GST)** rates on fly ash and its products have been reduced to 5%.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

**Q1. With reference to ‘fly ash’ produced by the power plants using coal as fuel, which of the following statements is/are correct? (2015)**

1. Fly ash can be used in the production of bricks for building construction.
2. Fly ash can be used as a replacement for some of the Portland cement contents of concrete.
3. Fly ash is made up of silicon dioxide and calcium oxide only, and does not contain any toxic elements.

**Select the correct answer using the code given below:**

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

**Ans: (a)**

**Q2. Consider the following: (2011)**

1. Carbon dioxide
2. Oxides of Nitrogen
3. Oxides of Sulphur

**Which of the above is/are the emission/emissions from coal combustion at thermal power plants?**

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

**Ans: (d)**

- Coal based power plants are the major contributor of the atmospheric air pollution and contribute significantly to the global warming and adverse health effects which can ultimately lead to diseases like lung cancer.
- Toxic compounds released from the burning of coal include:
  - Oxides of Carbon (CO<sub>x</sub>): Carbon Dioxide and Carbon Monoxide; **hence, 1 is correct.**
  - Oxides of Nitrogen (NO<sub>x</sub>); **hence, 2 is correct.**
  - Oxides of Sulphur (SO<sub>x</sub>); **hence, 3 is correct.**
  - Fly Ash.
- Trace elements like Mercury, Cadmium and lead are also emitted which are also hazardous for health. **Therefore, option (d) is the correct answer.**

**Source: DTE**

