



# NATIONAL WASTE MANAGEMENT

**SUMMIT AND AWARDS 2025**

With a special emphasis on Fly Ash &  
Gypsum Utilization



**WELCOME ADDRESS**

**MR.PANKAJ BATRA**

# National Waste Management Summit & Awards 2025

October 6, 2025, New Delhi

Pankaj Batra

Senior Advisor, IRADe &

Former Chairperson, CEA &

Advisory Board Member, Council of Enviro Excellence

# What is Waste Management

- Waste management encompasses the **systematic collection, treatment, and disposal of waste, prioritizing reduction, reuse, and recycling before resorting to landfilling or incineration, aiming to minimize environmental impact, promote a circular economy, and protect public health.** Effective systems use the "**waste hierarchy,**" which prioritizes waste prevention, followed by reuse, recycling, recovery, and finally, safe disposal.

# Waste Management in a Thermal Power Station

- Waste in a thermal power station includes the solid residue from fuel combustion, such as **fly ash and bottom ash**, which are major byproducts from coal-fired plants.
- **Other wastes** are process-related (spent catalysts, lubricants, sludge from wastewater treatment), maintenance-related (used insulation, machinery parts), and operational (packaging, construction debris).
- **Waste heat**, the largest by volume, is also a significant issue, as a substantial portion of the energy input is lost to the atmosphere during various stages of generation.

# Waste Management in a Thermal Power Station

- What is very important these days is waste gases. **Waste gases** from thermal power stations include harmful air pollutants like sulfur dioxide ( $\text{SO}_2$ ), nitrogen oxides ( $\text{NO}_x$ ), carbon dioxide ( $\text{CO}_2$ ) (a greenhouse gas), and suspended particulate matter (SPM).
- These can be controlled using technologies such as electrostatic precipitators (ESPs), flue gas desulfurization systems and Low  $\text{NO}_x$  burners, to reduce environmental and health impacts.

# Waste Management in a Thermal Power Station

- In the present case where a number of **Flue Gas Desulphurization (FGD) plants** have been retrofitted, there is a large production of synthetic gypsum expected to be generated (from the limestone in the FGD). This is a useful product used for :
  - **Building materials:** For making plaster, drywall, and wallboard.
  - **Cement manufacturing:** To regulate the setting time of cement.
  - **Agriculture:** To improve the properties of soil.
  - **Wastewater treatment:** To remove impurities.

# GIFT (Gujarat International Finance Tec) City

- GIFT City is both a smart city and India's first International Financial Services Centre (IFSC), establishing itself as a cutting-edge financial hub.
- It is a business district designed to be a global financial and IT hub, attracting domestic and international companies by offering a unique ecosystem with tax benefits. GIFT City aims to be a leading center for financial services, technology, and arbitration, setting high standards for business and governance.
- it implements a highly advanced automated solid waste management system designed to significantly reduce waste sent to landfills. Waste is piped at high speed to a central facility where it's segregated, with **organic waste converted to manure** and **inorganic waste incinerated to produce thermal power**. This system helps achieve a **circular economy** by minimizing human intervention and maximizing resource recovery.

# Extended Producer Responsibility

- India's central government policy for producer responsibility in the circular economy is built on **Extended Producer Responsibility (EPR)**, which makes manufacturers and importers accountable for the entire lifecycle of their products, from design to end-of-life management. EPR initiatives mandate producers to meet targets for collecting, recycling, and reusing waste streams like plastic packaging, e-waste, and batteries, thus promoting sustainable practices.

# Fly Ash Uses

- **Cement Manufacturing:**
  - Fly ash can be a substitute for cement, enhancing the strength and durability of concrete in Portland cement.
- **Roads and Embankments:**
  - Its lightweight and shear strength make it ideal for building roads and flyovers, reducing the need for conventional earth and saving agricultural land.
- **Fly Ash Bricks and Building Products:**
  - It is used to manufacture lighter and stronger bricks, pavement blocks, and tiles, replacing traditional burnt clay bricks.
- **Mine Filling and Backfilling:**
  - Fly ash is used to reclaim low-lying areas and fill mines, providing a way to manage the waste material.

# Bottom Ash Uses

- **Wastewater Treatment:** Bottom ash's coarse, granular texture and porous properties make it suitable for wastewater treatment applications.
- **Agriculture and Soil Reclamation:**
  - Studies show that bottom ash can improve the texture, water-holding capacity, and air content of clay soils when used for soil amendment.
- **Construction Applications:**
  - Similar to fly ash, bottom ash can be used in various construction materials, including precast products for rural pavements and other infrastructure.
- **Geo-polymer Applications:**
  - Both types of coal ash are also explored for use in geo-polymer concrete and other novel civil engineering applications.

# Policy and Regulatory Provisions

- The Ministry of Environment, Forest and Climate Change (MoEF&CC) notified Ash Utilization Notification, 2021 on 31.12.2021 and mandates coal or lignite based thermal power plants to achieve 100% utilisation of ash in the prescribed eco-friendly purposes and timelines.
- Ministry of Power issued Guidelines for the same on 15<sup>th</sup> March 2024.

Wish you all Fruitful Discussions