

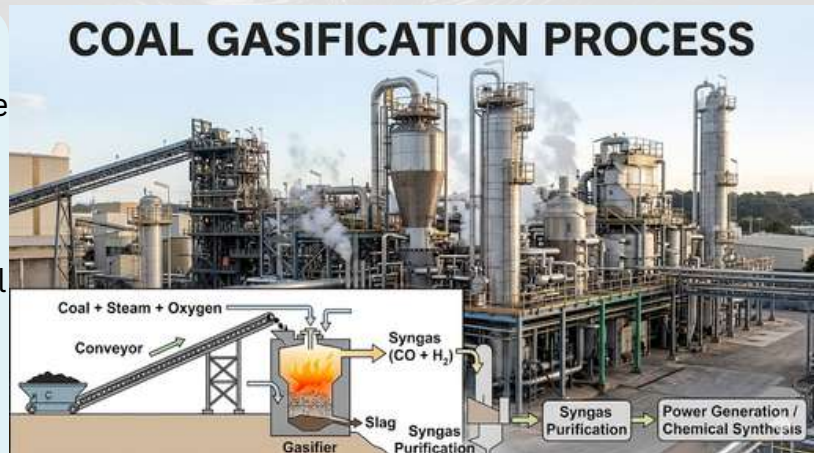
## 1 Coal Gasification (Source: The Economic Times)

Coal gasification is a process that transforms Coal into a Synthetic gas (Syngas), consisting of a mixture of gases such as Carbon monoxide (CO), Hydrogen (H<sub>2</sub>), Carbon dioxide (CO<sub>2</sub>), Methane (CH<sub>4</sub>) and Water vapor (H<sub>2</sub>O).

- Syngas can be used to produce a wide range of Fertilizers, Fuels, solvents and synthetic materials.

### Process

- **Preparation:** Coal is crushed into a fine powder to increase its surface area and enhance the chemical reactions during the process.
- **Gasification Reactor:** The crushed coal is introduced into a high-temperature and high-pressure reactor along with limited oxygen or air and steam.
- **Chemical Reactions:** In the absence of sufficient oxygen for complete combustion, the coal undergoes a series of complex chemical reactions.
- **Gas Cleaning:** The raw syngas produced from the reactor contains impurities like tar, sulfur, and dust. These impurities need to be removed through a gas cleaning process before the syngas can be used further.

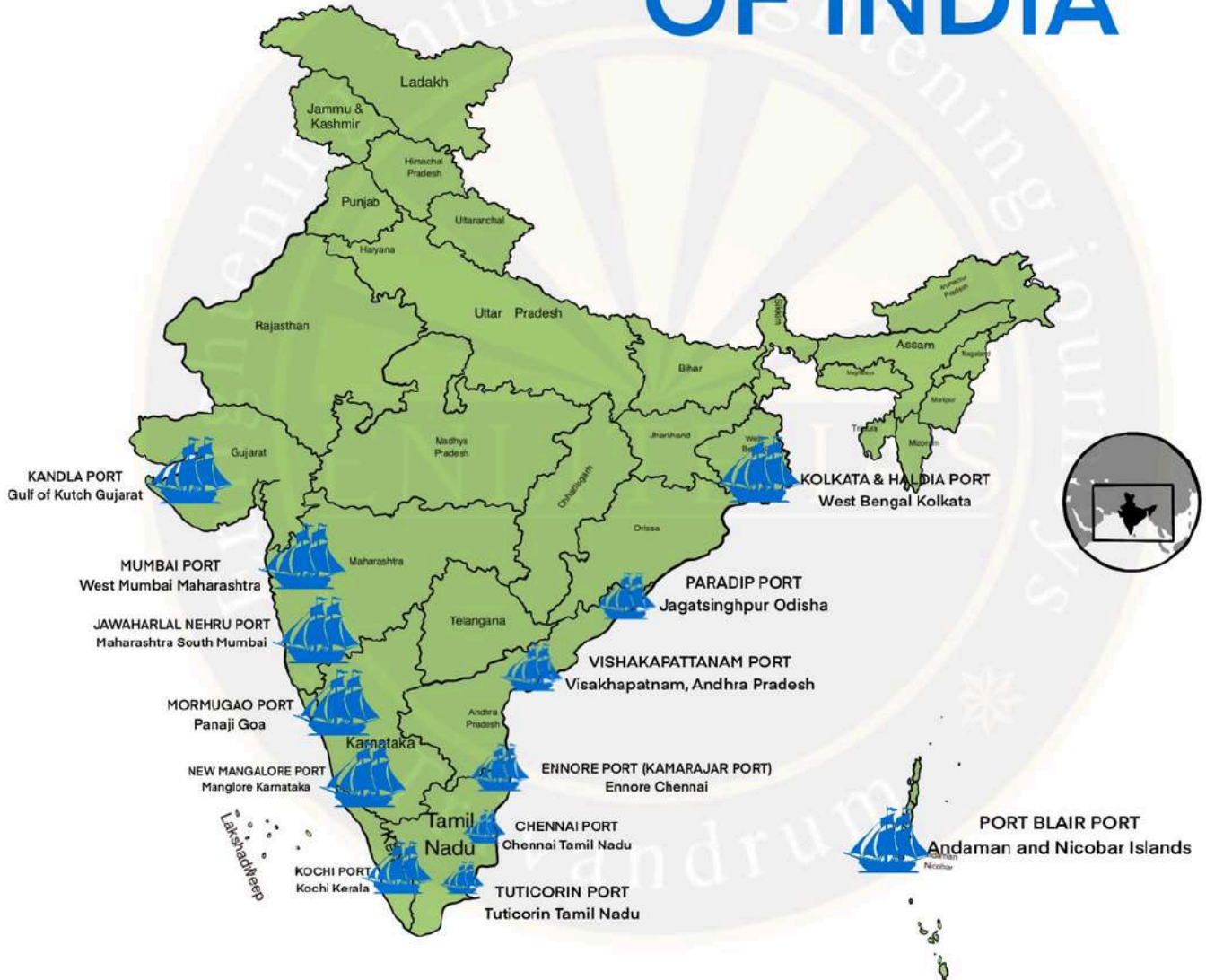


### Advantages

- Gasification boosts efficiency to 50%+ in integrated gasification combined cycle (IGCC) plants versus 30–40% in traditional coal plants, via gas turbine plus steam recovery.
- It cuts local pollutants (sulfur, particulates) through pre-use cleaning and enables >90% CO<sub>2</sub> capture potential.
- Applications include power, hydrogen, liquids (CTL), and chemicals, reducing oil import reliance

## 2 Major Ports in India (Source: The Hindu)

# MAJOR PORTS OF INDIA





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## 3 Forever Chemical (*Source: Down To Earth*)

Forever chemicals, also known as Per- and Polyfluoroalkyl Substances (PFAS), are a large group of man-made chemicals known for their persistence in the environment and potential health risks.

### Sources

- PFAS are used in a wide range of consumer products due to their beneficial properties. Some common examples include:
  - Non-stick cookware
  - Waterproof clothing and textiles
  - Food packaging (pizza boxes, popcorn bags)
  - Carpets and furniture
  - Cosmetics (mascara, foundation)
  - Firefighting foams

### Harmful Effects

- They cause a variety of health risks that are attributed to PFA exposure, including decreased fertility, developmental effects in children, interference with body hormones, increased cholesterol levels, and increased risk of some cancers.