Coal Gasification Based Methanol Production Plant

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In news– Recently, BHEL built India's first Indigenously Designed High Ash Coal Gasification Based Methanol Production Plant at its R&D Centre, Hyderabad.

Need for such plant

- **The majority of worldwide methanol production is derived from natural gas**, which is a relatively easy process.
- **Since India doesn't have much of the natural gas reserves,** producing methanol from imported natural gas lead to outflow of foreign exchange and sometimes uneconomical due to excessive prices of natural gas.
- The next best option is to utilise India's abundant coal.
- However, due to the high ash percentage of Indian coal, most internationally accessible technology will not be adequate for our demands.

BHEL's coal gasification project

- To address the issue mentioned above, **BHEL R&D centre at Hyderabad began working on Indian high ash coal gasification in 2016 with support from the NITI Aayog** to produce 0.25 ton per day methanol.
- **The project was supported by the Department of Science and Technology** with a Rs 10 crore grant.
- With four years of hard work BHEL successfully demonstrated a facility to create 0.25 TPD Methanol from high ash Indian coal using a 1.2 TPD Fluidized bed gasifier.
- The **methanol purity of the crude methanol produced is between 98 and 99.5 percent**.

- **This in-house capability will assist India's Coal Gasification Mission and Coal to Hydrogen Production for Hydrogen Mission.**

What is Coal Gasification?

- Coal gasification is **the process of converting coal into synthesis gas (also called syngas),** which is a mixture of hydrogen (H_2), carbon monoxide (CO), natural gas (CH_4), water vapour (H_2O) . and carbon dioxide (CO_2)—from coal and water, air and/or oxygen.
- The syngas can be used in a variety of applications such as in the production of electricity and making chemical products, such as fertilisers.
- Historically, coal was gasified to produce coal gas, also known as "town gas". Coal gas is combustible and was used for heating and municipal lighting, before the advent of large-scale extraction of natural gas from oil wells.
- In current practice, large-scale coal gasification installations are primarily for electricity generation, or for production of chemical feedstocks.
- The hydrogen obtained from coal gasification can be used for various purposes such as making ammonia, powering a hydrogen economy, or upgrading fossil fuels.

Methanol

- Methanol is utilized as a motor fuel, to power ship engines, and to generate clean power all over the world.
- Methanol is also used to generate di-methyl ether (DME), a liquid fuel that is very similar to diesel; existing diesel engines simply need to be minimally changed to use DME instead of diesel.