



Creating Methanol from Coal

Why in News

Recently, the **first Indigenously Designed High Ash Coal Gasification Based Methanol Production Plant** has been opened in Hyderabad.

- With this, Government owned engineering firm **BHEL (Bharat Heavy Electricals Limited)** has successfully demonstrated a facility to create methanol from high ash Indian coal.

Key Points

▪ About:

- **Methanol is utilized as a motor fuel**, to power ship engines, and to generate clean power all over the world. **However**, 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 leads to outflow of foreign exchange and is uneconomical because of higher prices.
- 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.
- To address this issue, BHEL successfully demonstrated a facility to create 0.25 TPD (Ton per Day) 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%.
- This is part of [NITI Aayog's 'Methanol Economy' programme](#) that is aimed at reducing India's oil import bill, greenhouse gas (GHG) emissions, and converting coal reserves and municipal [solid waste](#) into methanol.
- Also this in-house capability will **assist India's [coal gasification mission](#)** and coal-to-hydrogen production for [Hydrogen Mission](#).

▪ NITI Aayog's Methanol Economy Programme:

- **About Methanol:** Methanol is a **low carbon, hydrogen carrier fuel produced from** high ash coal, agricultural residue, CO₂ from thermal power plants and natural gas. It is the best pathway **for meeting India's commitment to [COP 21 \(Paris Agreement\)](#)**.
- **Methanol vis-a-vis-Petrol and Diesel:** Although **slightly lower in energy content than petrol and diesel**, methanol **can replace both these fuels** in the transport sector (road, rail and marine), energy sector (comprising boilers, process heating modules, tractors and commercial vehicles) and retail cooking (replacing LPG [partially], kerosene and wood charcoal).
- **Environmental and Economic Impact:**
 - Blending of 15% methanol in gasoline can result in **at least 15% reduction in the import of gasoline/crude oil**. In addition, this would **bring down GHG emissions by 20%** in terms of particulate matter, NO_x, and SO_x, thereby improving the urban air quality.

- The Methanol Economy **will also create close to 5 million jobs** through methanol production/application and distribution services.
- Additionally, Rs 6000 crore can be saved annually by **blending 20% DME (Dimethyl Ether, a derivative of methanol) in LPG**. This will help the consumer in saving between Rs 50-100 per cylinder.
- **Initiatives Taken:**
 - The [Bureau of Indian Standards](#) has notified **20% DME blending with LPG**, and a notification for M-15, M-85, M-100 blends has been issued by the Ministry of Road, Transport and Highways.
 - In **October 2018**, Assam Petrochemicals launched **Asia's first canister-based methanol cooking fuel programme**. This initiative is in line with the Prime Minister's vision of striving towards the provision of a clean, cost-effective and pollution-free cooking medium.
 - **Five methanol plants** based on high ash coal, five DME plants, and one natural gas-based methanol production plant with a capacity of 20 MMT/annum, **in a joint venture with Israel**, have been planned to be set up.
 - Three boats and seven cargo vessels are being built by the Cochin Shipyard Limited for [Inland Waterways Authority of India](#) to use **methanol as a marine fuel**.

Way Forward

- India, with 125 Billion Tonnes of proven Coal reserves and 500 million tonnes of Biomass generated every year has a huge potential for ensuring energy security based on alternate feedstock and fuels.
- However, Methanol does not get the same attention from the government as [EV \(Electric Vehicles\)](#), even though the former can come in faster. There is significant work needed to implement the Methanol Economy holistically.
- The development of methanol based technology can turn energy-importing India into an energy exporting country.

[Source: PIB](#)

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