

# Methanol Economy

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## What is the methanol economy?

- The methanol economy is a suggested future economy in which methanol and dimethyl ether replace fossil fuels as a means of energy storage, ground transportation fuel, and raw material for synthetic hydrocarbons and their products.
- it is being touted as the bridge between current fossil fuel based economy to Hydrogen economy

## What is methanol?

- Methanol as a low carbon, hydrogen carrier fuel” produced from high ash coal, agricultural residue, CO<sub>2</sub> from thermal power plants and natural gas
- It is the best pathway for meeting India’s commitment to COP 21.

## Methanol Economy program

- Methanol Economy program **initiated by NITI Aayog** is aimed at reducing our oil import bill; reducing greenhouse gas (GHG) emissions & converting Indian coal reserves and municipal solid waste into methanol leading to independence from import while creating new jobs by setting up Methanol Production Plants.
- Under Indian Methanol Economy program 5 methanol plants based on high ash coal, 5 DME plants and 1 natural gas based methanol production plant with a total production of 20 MMT/ annum in joint venture with Israel, are planned to be set up. 3 boats and 7 cargo vessels are being built by Cochin Shipyard Limited for Inland Waterways Authority of India to use Methanol as a marine fuel for inland waterways program.

## **Benefits:**

- Methanol, although slightly lower in energy content than petrol and diesel, can replace both petrol and diesel in transport sector (road, rail and marine), energy sector (comprising of DG sets, boilers, process heating modules, tractors and commercial vehicles) and retail cooking replacing LPG (partially), Kerosene and wood charcoal.
- Blending of 15% methanol in gasoline can result in at least 15% reduction in import of gasoline/ crude.
- In addition, it would bring down GHG emissions by 20% in terms of particulate matter, NO<sub>x</sub>, and Sox thereby improving urban air quality.
- It will result in a minimum 15% reduction in fuel bill annually for the country by 2030 and it 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 of 20% DME (Di-methyl Ether – a derivative of methanol) in LPG. To the consumer, it will result in saving a minimum of Rs. 50 to Rs. 100 per cylinder.

## **India's efforts**

- India has an installed Methanol Production capacity of 2 MT per annum.
- Methanol Economy Program by NITI Aayog
- India is going to implement Methanol 15 % blending program with Petrol and cost of petrol is expected to come down immediately by 10%.
- India has conducted extensive discussions with Israel, which has successfully implemented Methanol 15 (M15) blending program for Technology transfer.
- Global engine manufacturers like Volvo, Caterpillar, and Mercedes etc. are collaborating with Indian players.
- Recently, Assam Petro-chemicals has launched Asia's first canisters based methanol cooking fuel program.

Methanol cook stoves can result in a minimum of 20% savings for households in comparison to LPG. After huge success at pilot scale the methanol cooking program is being scaled up to 1,00,000 households by next year in the few other states

- Thermax Ltd. has successfully developed a 5 KW methanol based reformer on a Direct Methanol Fuel Cell (DMFC). This module is being tested to replace DG sets in mobile towers. For direct electricity generation, Kirloskar Oil Engines Ltd. has converted a 5 KW generator set to run on 100% methanol and demonstrated successfully.
- Kirloskar is working towards converting generator sets of 150 – 300 KVA/KW capacity in collaboration with Dor Chemicals, Israel.
- As a part of R & D program, work is in progress to set up coal to methanol plants in the country using the indigenous technology which are currently being demonstrated at BHEL (Hyderabad), Thermax, BHEL (Trichy) and IIT Delhi.
- R & D project have been sanctioned by Department of Biotechnology for production of Methanol from biomass to IISc Bengaluru and Praj Industries Pune.