

General Studies-3; Topic: Conservation related issues.

Methanol Based Economy

1) Introduction

- Methanol is the future of fuel in India.
- The methanol economy is a future economy in which methanol and dimethyl ether replace fossil fuels as a means of energy storage, transportation fuel, and raw material for synthetic hydrocarbons and their products.
- Across the world, methanol is emerging as a clean, sustainable transportation fuel of the future.

2) Why Methanol Based Economy

- Hydrocarbon Fuels have adversely affected the environment with Green House Gas Emissions (GHG).
- Urban Transport contributes to close to 40% towards urban air pollution.
- Annually 400000 deaths take place in India due to air pollution.
- Methanol Economy is the “Bridge” to the dream of a complete “Hydrogen based fuel systems”.
- Methanol is a scalable and sustainable fuel, that can be produced from a variety of feedstocks like Natural Gas, Coal, Bio-mass, Municipal Solid waste and CO₂.
- CO₂ from steel plants, Thermal Power plants, Cement Plants etc. can be tapped in large quantities to produce Methanol.
- Crude oil imports drain our foreign exchange, putting enormous pressure on our currency & thereby weakening our bargaining power with the rest of the world.
- Methanol can be a major market in India, besides helping us reduce oil imports by 20%
- India imports methanol from Saudi Arabia and Iran at present.
- The development of methanol based technology could turn energy-importing India into an energy-exporting country.
- Methanol Economy can be one of the best ways to mitigate the Environmental hazards of a growing economy.

3) Advantages

- Methanol is a clean burning drop in fuel which can replace both petrol & diesel in transportation & LPG, Wood, Kerosene in cooking fuel.
- It can also replace diesel in Railways, Marine Sector, Gensets and Power Generation.
- The gaseous version of Methanol can be blended with LPG and can be excellent substitute for diesel in large buses and trucks.
- To adopt Methanol as a transport fuel, it requires minimal infrastructure modifications and capital.
- India by adopting Methanol can have its own indigenous fuel at the cost of approximately Rs. 19 per litre at least 30% cheaper than any available fuel.
- At least 20% diesel consumption can be reduced in next 5-7 years and will result in a savings of Rs. 26,000 crore annually.
- Methanol blending program with petrol will further reduce our fuel bill by at least Rs. 5000 crore annually in next 3 years.
- Methanol is not only a clean fuel, it is light and can be easily carried to hilly areas.
- Adopting methanol would mitigate the ever-rising fuel price, including that of LPG.
- Methanol can be stored economically over a long time and command a higher value in the commodities market.

- Since methanol can be produced from municipal waste, it helps in tackling urban solid waste problem.

4) International Practice

- Methanol Economy is being actively pursued by China, Italy, Sweden, Israel, US, Australia, Japan and many other European countries.
- 10% of fuel in China in transport Sector is Methanol.
- China alone produces 65% of world Methanol and it uses its coal to produce Methanol.
- The Technology has acquired commercial maturity and countries like Iceland are producing in meaningful quantities already.
- Israel, Italy have adopted the Methanol 15% blending program with Petrol.
- Methanol is seen by the world as the “Enduring Energy Solution known to Mankind”.

5) Environmental Impact

- Methanol burns efficiently in all internal combustion engines, produces no particulate matter, no soot, almost nil SOX and NOX emissions.
- Methanol 15 % blend (M15) in petrol will reduce pollution by 33% & diesel replacement by methanol will reduce by more than 80%.
- Methanol fuel can result in great environmental benefits and can be the answer to the burning urban pollution issue.

6) NITI Aayog's Plan

- NITI Aayog has drawn out a comprehensive plan to replace 20% of crude imports from Methanol alone.
- As per the plan, by using Indian High Ash coal, Stranded gas, and Biomass we can produce 20MT of methanol annually by 2025.
- It would bring down pollution in the country by more than 40% and benefit from import substitution.
- Over a period of time, diesel can completely be done away with.

7) India's First Methanol-based Cooking Fuel

- The Namrup-based Assam Petrochemicals Limited (APL) rolled out the country's first methanol-based cooking fuel project- 'Green and Clean Fuel Pilot Project on Methanol Cooking Stove'.
- This is seen as India's first step towards realising the concept of “methanol economy”.
- The project has been promoted by NITI Aayog.
- The cooking fuel will mostly impact women in India,
- There are 5.5 lakh people in Africa and 8 million in China who use methanol as cooking fuel.
- But India is the first country where the focus is on replacing LPG.
- Unlike LPG, which can explode if it catches fire, the methanol canister will burn out without any explosion.

8) Facts for Prelims

- Methanol is a liquid chemical with the formula CH_3OH .
- It is colorless, volatile, flammable, and poisonous.
- Methanol is made from the destructive distillation of wood and is chiefly synthesized from carbon monoxide and hydrogen.
- Its principal uses are in organic synthesis, as a fuel, solvent, and antifreeze.
- Methanol is far more toxic than ethanol.