



SMALL SCALE LNG - GS III MAINS

Q. What is SSLNG? Highlight its significance in ensuring smooth transition to green energy? (10 marks, 150 words)

News: *The big promise of small-scale LNG as fuel for India, with first SSLNG plant commissioned*

What's in the news?

- The Union Minister for Petroleum and Natural Gas Hardeep Singh Puri has recently dedicated to the nation India's first small-scale liquefied natural gas (SSLNG) unit at GAIL (India) Ltd's Vijaipur complex in Madhya Pradesh.

SSLNG (Small Scale Liquefied Natural Gas):

- It refers to **gas in its liquid or super-chilled form** supplied in specialized trucks and small vessels to industrial and commercial consumers in regions not connected by pipelines.
- The SSLNG chain can start from a large-scale LNG import terminal from where the LNG can be transported to consumers by cryogenic road tankers or small vessels.
- The chain can also start at locations with ample natural gas supply or production, where small liquefaction plants can be set up. For example - The SSLNG unit at **Vijaipur**.

Working of SSLNG:

Treatment Skids:

1. Zeolite Pre-treatment Skids:

- It is used to process natural gas at a pressure of 15 bar to remove non desirable components such as nitrogen, water, Sulphur and Carbon dioxide.

2. Liquefaction Skids:

- It is known as CRYO BOX for converting natural gas to LNG at pressure of around 260 bar.

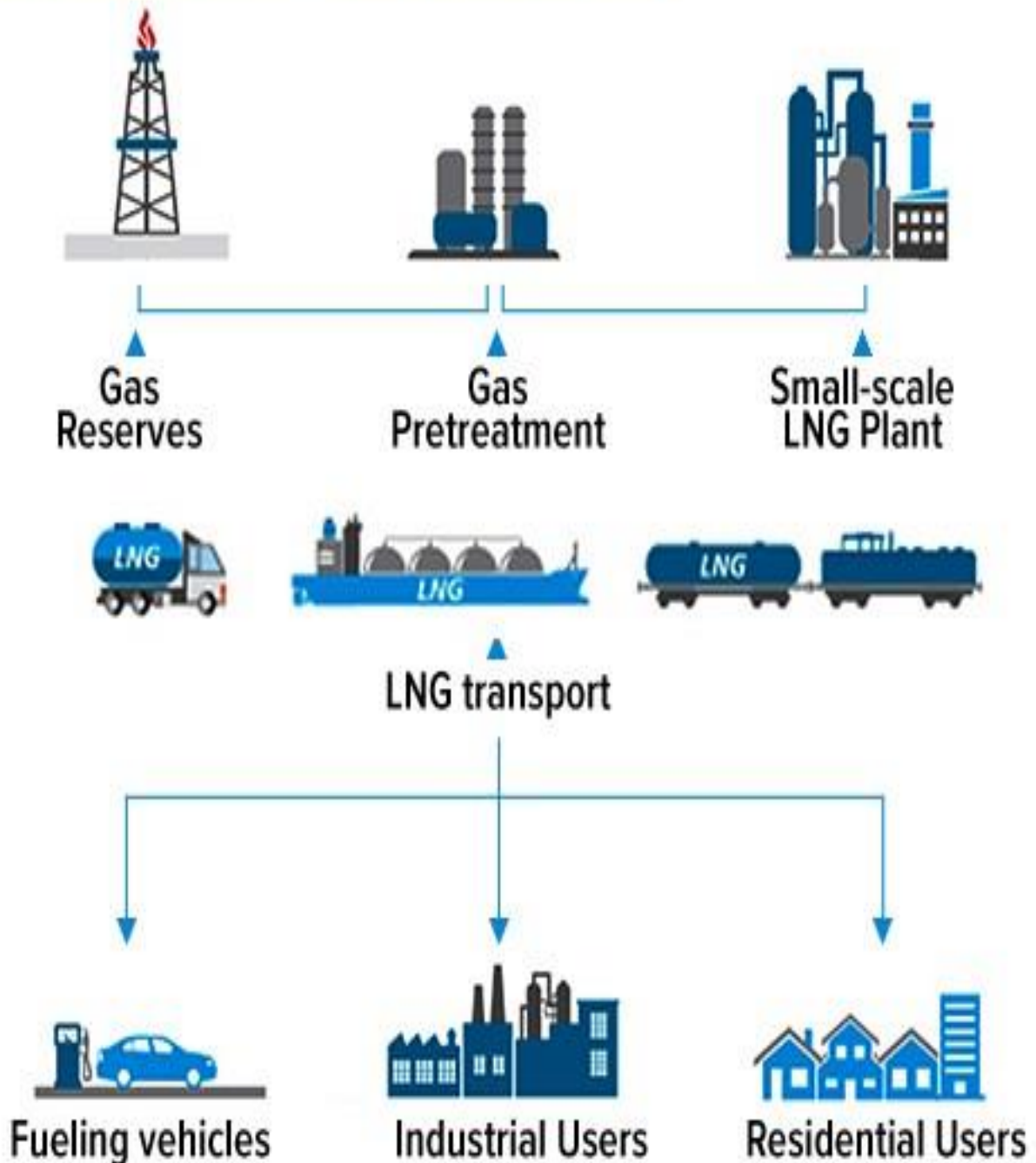
Procedures:

- The gas is cooled by a propane based external refrigeration system to minus 60-70 degrees Celsius and then subjected to expansion, such that the temperature falls below minus 140 degrees Celsius allowing it to liquify.
- The LNG will then be dispatched by cryogenic tankers to nearby areas for use in city gas distribution networks as CNG and piped gas, and in LPG filling stations for medium and heavy vehicles.



- The SSLNG unit is controlled by an automated, web based supervisory control and data acquisition (SCADA) system, a mechanism that is typically used to monitor large industrial devices and processes.

THE SMALL-SCALE LNG JOURNEY





Need for Small Scale LNG:

1. Government Ambition:

- Government aims to increase the share of Natural gas in its primary energy mix to 15% by 2030 from a little more than 6% at present.

2. Reduction in Pollution:

- Natural gas is far less polluting than conventional hydrocarbons like coal and oil.

3. Reduce Import Burden:

- Natural gas is cheaper than oil (85% of oil requirement comes from imports). Replacing a major chunk of diesel consumption by LNG could lead to substantial foreign exchange savings.

4. Transition Fuel:

- Natural gas is seen as a key transition fuel in India's journey towards green energy and future fuels.

5. Scaling up Consumption:

- Large scale pipeline projects that are in the works will take years to be completed, even so, last mile delivery challenges may persist in many parts of the country.

6. More Mileage:

- LNG offers a slightly longer range to vehicles with similar sized fuel tanks.

Significance of Small Scale LNG:

1. Transition to Green Energy:

- The government aims to increase the share of natural gas in its primary energy mix to 15% by 2030 from 6% at present.
- This is because natural gas is far less polluting than conventional hydrocarbons like coal and oil.
- It is seen as a key transition fuel in India's journey towards green energy and future fuels.

2. Decarbonization of Transportation Sector:

- It is cleaner fuel with reduced emission of carbon dioxide and negligible amounts of particulate matter, nitrogen oxide, and Sulphur dioxide as compared to diesel.

3. Overcome the Transportation Challenge of Natural Gas:

- There are many places that are not connected by the country's natural gas pipeline grid.
- This hinders the use of LNG directly as fuel for long-haul trucks and inter-city buses.
- This challenge can be overcome by small-scale liquefied natural gas units.

4. Save Forex Reserve:

- It is usually cheaper than crude oil, from which diesel is derived.



- Thus, replacing a major chunk of India's diesel consumption by LNG could lead to substantial foreign exchange savings.

Challenges:

1. Paucity of LNG-powered Vehicles:

- There is a shortage of LNG-powered vehicles in India.

2. High Cost:

- The LNG-powered vehicles have higher initial cost as compared to diesel run vehicles.

3. Financing Ecosystem:

- India does not have a robust LNG vehicle financing ecosystem.

4. Retail Network:

- India does not have an LNG retail network.

Government Measures:

- Petronet has collaborated with commercial vehicle manufacturers and other public sector oil and gas companies for trials and pilot projects for LNG-fueled trucks and buses.
- Petronet has established a few LNG dispensing stations along highways.
- GAIL is looking to build LNG dispensing stations along major highways.

WAY FORWARD:

- Companies such as GAIL and Petronet are working to build a viable ecosystem for transporters to move from diesel vehicles to LNG.
- Petronet has collaborated with commercial vehicle manufacturers and other public sector oil & gas companies for trials and pilot projects for LNG-fuelled trucks and buses.
- Petronet has established a few LNG dispensing stations along highways. Similarly, Indian Oil Corporation is also planning to build LNG dispensing stations along major highways.