

India's First LNG-Powered Train

Prelims: Current events of national and international importance | Government Policies and Interventions

Why in News?

Union Home & Cooperation Minister flagged off **India's first LNG-powered train** from **Sabarmati Railway Station, Ahmedabad, Gujarat**.

- It introduces **LNG-diesel dual-fuel technology** in Indian Railways.



India's First LNG-Powered Train

Parameter	Key Fact
 LNG	Liquefied Natural Gas
 First LNG-powered train in India	Flagged off in 2026
 Location	Sabarmati Station, Gujarat
 Technology	LNG – Diesel dual-fuel system
 Driving Power Cars (DPCs)	2
 Power of each DPC	1,400 HP
 Field trials	2,000+ km
 Diesel replacement	Up to ~40%
 LNG tank capacity/DPC	~2,200 litres
 Usable LNG	~950–1,000 kg
 Range per full tank	~444 km
 Estimated annual saving/DPC	₹11.9 lakh
 Estimated saving for 8-coach rake	~₹23.9 lakh/year

Liquefied Natural Gas (LNG)

- LNG primarily consists of **methane (CH₄)**.
- Natural gas is cooled to approximately **-162°C** in order to convert it into a liquid state.
- The liquefaction process substantially reduces the volume of natural gas, thereby facilitating storage and transportation.
- When needed, LNG is **regasified** and subsequently utilized as a fuel.
- Compared to conventional diesel, the combustion of LNG generally results in **lower particulate and nitrogen oxide (NO_x) emissions**, and can also reduce carbon dioxide (CO₂) emissions.

LNG vs CNG vs Hydrogen — Quick Comparison



	LNG	CNG	Hydrogen
 LNG	 CNG	 Hydrogen	
Parameter	LNG	CNG	Hydrogen
 Full form	Liquefied Natural Gas	Compressed Natural Gas	Hydrogen
 Main characteristic	Gas liquefied by cooling	Gas compressed under pressure	Chemical element/fuel
 Main component	Methane	Methane	H ₂
 Storage	Cryogenic liquid	High-pressure gas	High-pressure/other specialised storage
 Carbon emissions	Yes	Yes	Depends on production pathway
 Railway relevance	Alternative/dual fuel	Mainly road transport	Emerging railway technology

• Advantages

- Decrease reliance on **diesel fuel**
- Reduce overall fuel costs
- Lower emissions of specific air pollutants
- Diversify the range of fuel sources available to railways
- Contribute to cleaner transportation systems
- Decrease foreign-exchange outflows by reducing reliance on imported petroleum products
- Offer an alternative fuel option for railway segments that are not electrified

It is important to note that LNG remains a fossil fuel and should not be regarded as a zero-carbon energy source.

• Other Railway Projects Launched at Sabarmati

• WAG-12 Maintenance Shed

- This facility will support the maintenance of **WAG-12 electric locomotives**.
- The WAG-12 is a **high-horsepower electric freight locomotive**.
- It plays a critical role in heavy freight operations.

- **Kavach**

- India's indigenous **Automatic Train Protection (ATP)** system.
- It is designed to enhance railway safety.
- It helps prevent collisions and assists in controlling trains that exceed prescribed speed limits.
- During the Sabarmati programme, Kavach was implemented across sections of the Ahmedabad Division.

- **Automatic Block Signalling**

- Automatic Block Signalling allows trains to operate at closer, yet safe, intervals.
- This system helps increase **line capacity and operational efficiency**.

- **Line Doubling**

- It increases the number of tracks available for train movement.
- This helps reduce congestion and improves both passenger and freight movement.

Reference

[The Hindu | India's First LNG-Powered Train](#)

