9th Edition

LNG INDIA SUMMIT

SANKALP: A report on key LNG trends

LNG INDIA SUMMIT 9th Edition

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Background

India's growing energy needs, coupled with global decarbonization imperatives, have positioned Liquefied Natural Gas (LNG) as a vital transition fuel. LNG has become an integral part of the global energy landscape, offering a cleaner, more flexible, and scalable alternative to conventional fossil fuels. Stricter international regulations on emissions and the increasing demand for cleaner, more flexible energy solutions are reshaping global LNG markets, where regions such as China, Europe, Singapore, and the United States have already established strong infrastructure and policy support.

In India, LNG plays an increasingly important role in bridging the gap between rising energy demand and the availability of domestic natural gas. While significant progress has been made with the commissioning of LNG terminals and the expansion of the pipeline network, utilization remains inconsistent due to pricing volatility, infrastructure constraints, and regulatory complexities. At the same time, emerging opportunities in city gas distribution, industrial consumption, LNG-powered transport, and bunkering present strong potential for growth. This report on key LNG trends sets the context by examining global trends, India's current LNG infrastructure, and key challenges, aimed at providing a foundation for the house to deliberate and arrive at constructive solutions for accelerating LNG adoption in India.

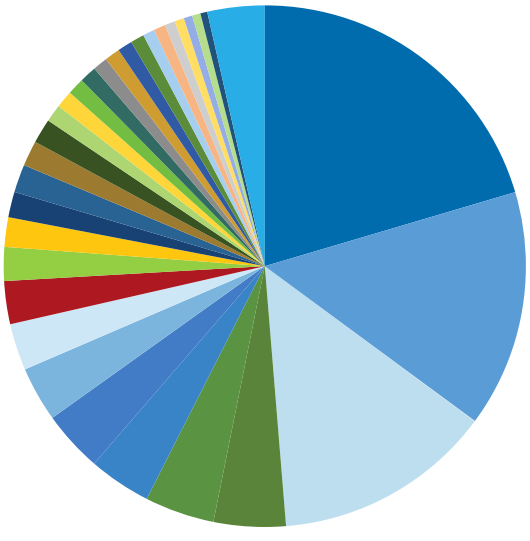
Global LNG Trends

LNG regasification terminals

At the end of December 2024, global regasification capacity stood at 1,064.7 MTPA across 47 markets. During 2024, 66.6 MTPA of additional regasification capacity was brought online, driven by the commissioning of ten new LNG import terminals, six expansions, and one reactivation project of existing terminals. Figure 1, below presents the global LNG regasification capacity by market (in MTPA) along with the annual regasification utilization rates as of 2024.

Japan holds the largest regasification capacity globally at 217.1 MTPA, although its utilization rate is relatively moderate at 31%. China follows with a capacity of 156.3 MTPA with a utilization rate of 50%, reflecting its growing demand for LNG. India ranks third globally with 44.5 MTPA capacity and a utilization rate of 59%. While some geographies such as The Netherlands and Chinese Taipei highlight higher utilization rates, others like Brazil and Canada have underutilized regasification rates at a mere 7% and 4% respectively.

Figure 1: LNG regasification capacity by market (MTPA) and annual regasification utilization, 2024[1]



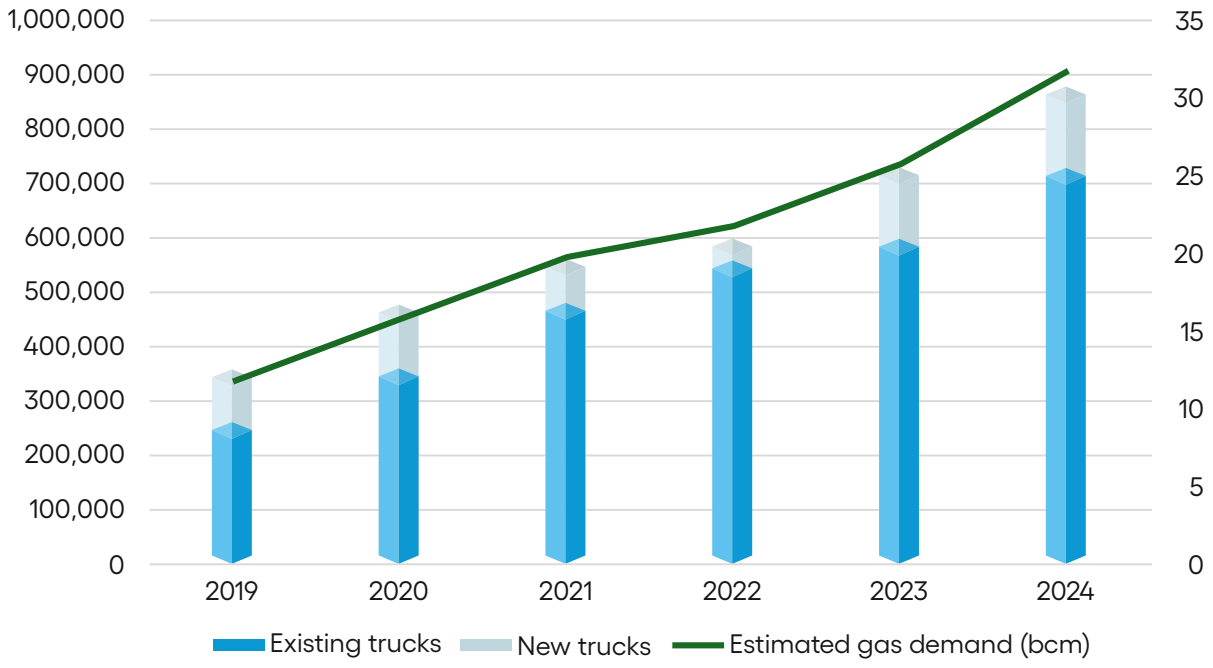
- Japan, 217.1, 31%
- South Korea,143.5, 33%
- India, 44.5, 59%
- Brazil,40.7, 7%
- Turkey,30.9, 29%
- Germany,22.8, 21%
- Netherlands, 17.6, 76%
- Itley,16.9, 63%
- Indonesia,11.4, 46%
- Kuwait,11.3, 64%
- Pakistan, 10, 72%
- UAE, 9.8, 10%
- Bangladesh, 7.6, 79%
- Malaysia, 7.3, 48%
- Portugal, 5.8, 59%
- Finland, 4.3, 36%
- China, 156.3, 50%
- Spain,49.8, 27%
- United States, 41.4, 5%
- United Kingdom, 36.5, 22%
- France, 28.4, 64%
- Thailand, 19, 62%
- Mexico, 17.6, 4%
- Chinese Taipei, 16.5, 132%
- Belgium, 11.3, 60%
- Singapore, 11, 57%
- Philippines, 10, 14%
- Greece, 9, 17%
- Canada, 7.5, 4%
- Bahrain, 6, 0%
- Chile, 5.5, 44%
- Smaller Markets, 37.3, 56%

[1] *Source: International Gas Union Report 2025*

China - A growing market for LNG HDV

China has emerged as a global leader in the integration of LNG into its transportation sector, particularly in the heavy-duty trucking industry. The country's journey with LNG as a vehicle fuel dates back to 1961, when initial research on LNG-powered vehicles began. The widespread adoption of LNG in China has been largely enabled by targeted government policies and incentives. These measures include subsidies for LNG vehicle purchases and restrictions on diesel trucks in key areas, such as major ports and pollution-prone regions. As of December 2024, China's LNG-powered truck fleet had reached around 8.8 lakh vehicles (Figure 2, below), with projections indicating growth to one million by the end of 2025[2]. The country has also significantly expanded its refuelling network, operating approximately 4,800 LNG dispensing stations as of December 2024[3] across key transportation corridors to ensure accessibility and efficiency for long-haul logistics. The impact of these efforts is reflected in heavy-duty truck sales, where sales of LNG models rose 127% year-on-year during January to May 2024, accounting for 21.4% of the country's total heavy-duty truck sales during the period.[4]

Figure 2: Year-on-year growth in LNG HDVs (in no.) in China with estimated gas demand in billion cubic meters (bcm)



[2] *Source: Year-on-year growth in LNG trucks in China*

[3] *Source: Blue Energy Motors*

[4] *Source: China Association of Automobile Manufacturers*

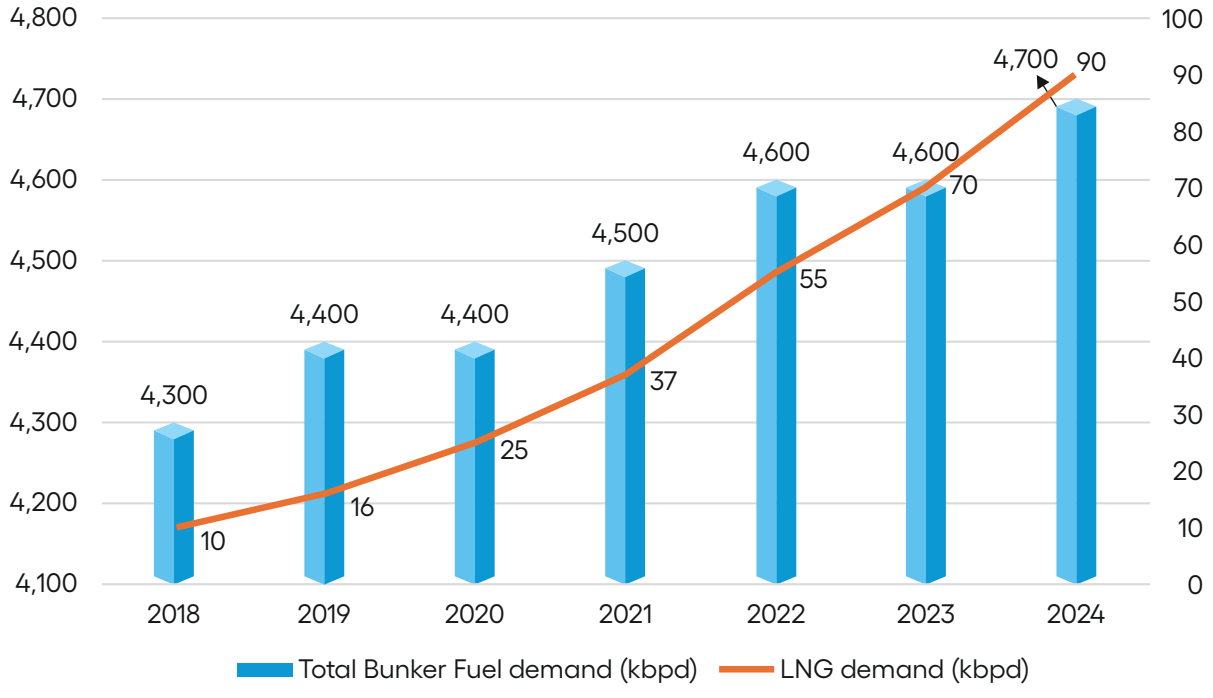
Europe

As of Jan 2023, Europe has around 635 LNG refuelling stations across 21 countries and more than 15,000 LNG run HDVs. Germany continues to host the highest amount of LNG stations for trucks with 162 stations, followed by Italy with 130, the data shows. Moreover, Spain has 90 LNG filling stations, France 70, the Netherlands 33, Sweden 28, Belgium 26, Poland 24, Finland 15, and the UK 14[5] . Adoption of LNG in HDV in the European Union (EU) was as early as 2013.

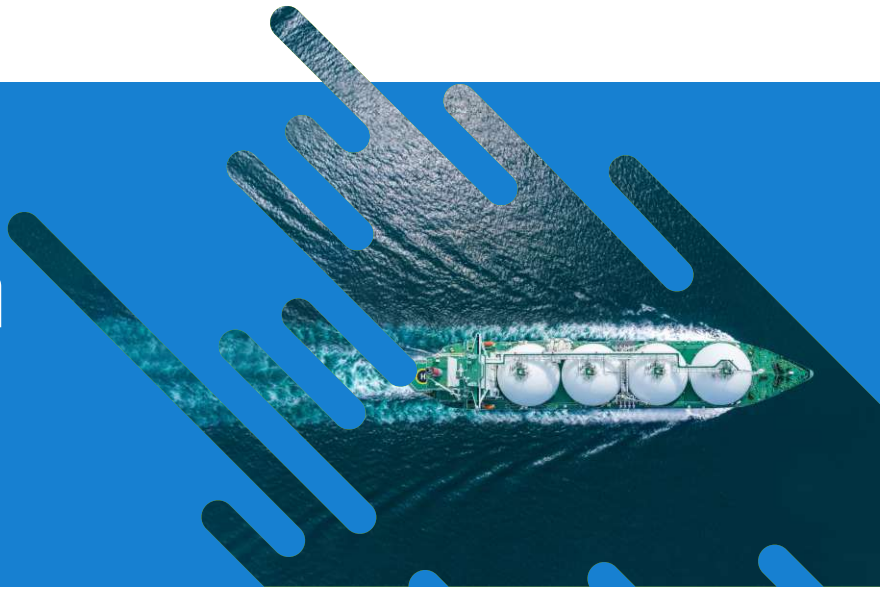
LNG bunkering

The global LNG bunkering market has gained strong momentum in regions such as Northwest Europe, Singapore, and the Mediterranean, supported by robust infrastructure and proactive government initiatives. Europe alone accounts for 44% of the world's operational LNG bunkering fleet. While overall bunker fuel demand has grown at a modest CAGR of 1.5% over the past six years, LNG as a marine fuel has experienced exceptional growth, registering a CAGR of 44.2% between 2018 and 2024. Consequently, LNG's share in total bunker fuel consumption has risen sharply - from just 0.23% in 2018 to nearly 1.91% in 2024, as depicted in Figure 3, below.

Figure 3 : Total bunker fuel demand vs. LNG demand in shipping



[5] *Source: LNG Prime*

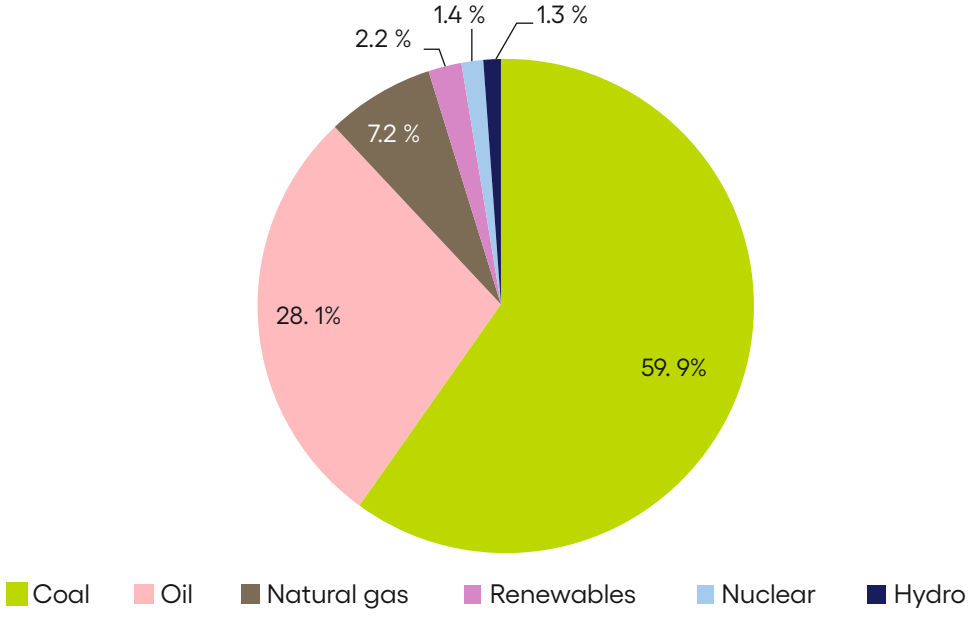


LNG ecosystem in India

Historic trends in India

Natural gas, recognized for its versatility and strategic value, continues to be a critical fuel for the nation's energy future, particularly as India pursues its net-zero emission goals by 2070. The demand for natural gas is rising steadily, and according to the International Energy Agency (IEA), India's natural gas demand to surge by nearly 60% to reach 103 billion cubic meters (bcm) annually by 2030. Natural gas plays a small role in the energy mix, with a share of around 7.2% in FY 2024 (Projected), as shown in Figure 4, below. However, the Government of India has set a target of increasing the share of natural gas in the country's primary energy mix to 15% by 2030, focusing on expanding natural gas infrastructure, including LNG terminals and pipelines, to support this growth. In comparison, the share of natural gas in global primary energy mix was ~23% in 2023.[6]

Figure 4: India energy mix in FY 2024 (Projected)][7]

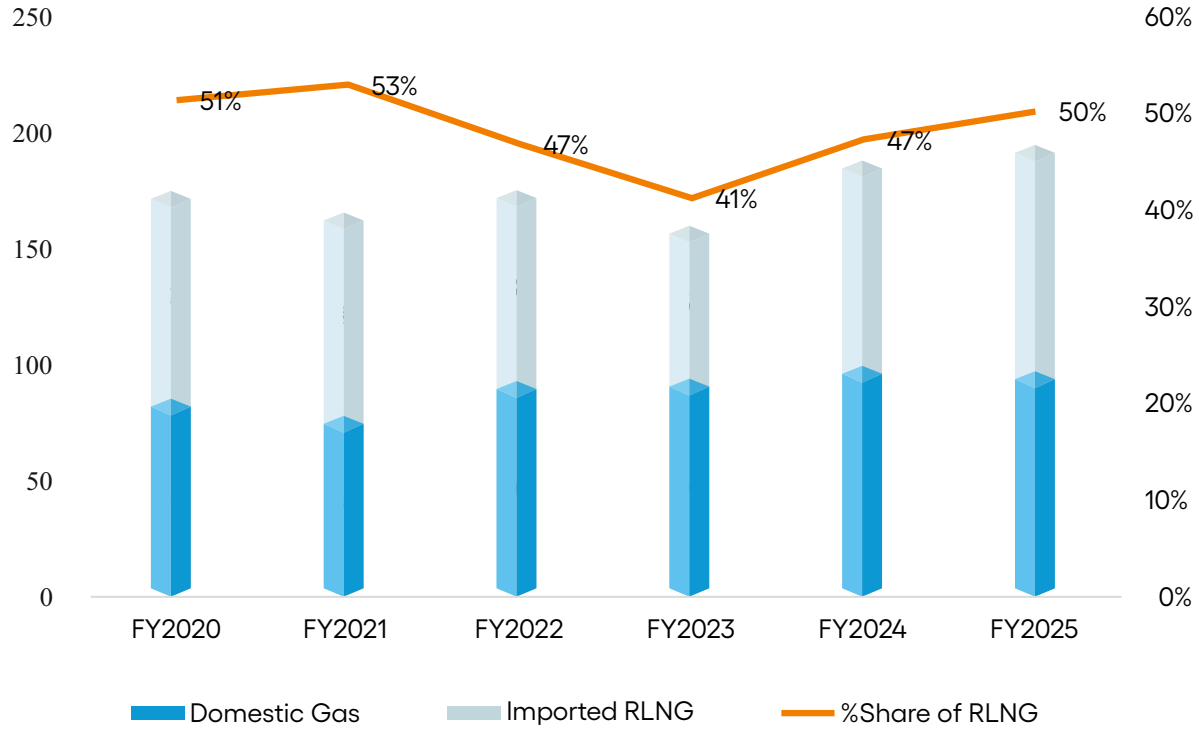


[6] *Source: MSCI Sustainability Institute, based on data from the Statistical Review of World Energy*

[7] *Source: India Climate & Energy Dashboard*

To meet the growing energy demand, given the domestic gas production constraints, India is increasingly reliant on imported Re-gasified Liquefied Natural Gas (RLNG). LNG, natural gas that has been cooled to a liquid state to facilitate storage and transport, has become a critical component of the country's energy mix. Over the past six years, LNG share has remained at a constant ~50% of the overall natural gas consumption in India. India remains the fourth-largest LNG importer globally. Historic domestic gas production and imported RLNG trends in India is shown in the Figure 5, below.

Figure 5 : Domestic gas and RLNG consumption in India in million standard cubic meters per day (MMSCMD)[8]



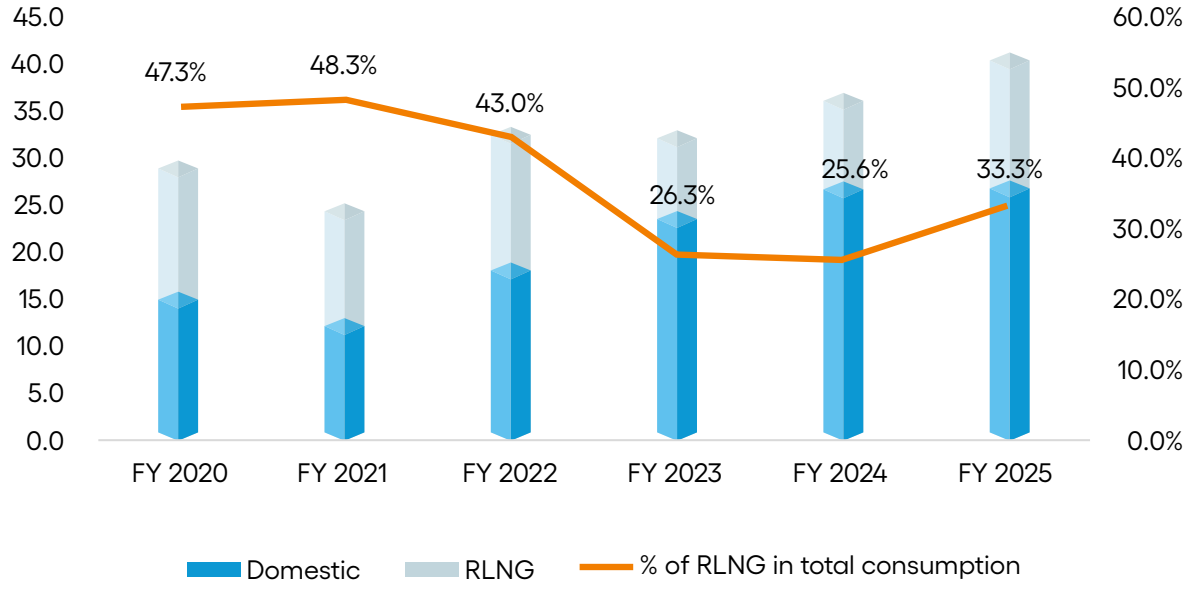
Dependence of various natural gas consuming sectors on LNG in India

City Gas Distribution (CGD) sector

The CGD sector is expected to serve as a key driver for LNG demand in India, accelerated by ~100% coverage of authorizations in 307 GAs (Geographical Areas) by PNGRB, rapid CNG (Compressed Natural Gas) infrastructure expansion and competitive pricing against liquid fuels. The dependency of the CGD sector on LNG from FY 2020 to FY 2025 is provided in Figure 6, below.

[8] *Source: PPAC*

Figure 6 : LNG and domestic gas mix in the CGD Sector[9]



Other LNG consuming sectors

Across key consuming sectors, LNG plays an increasingly important role in their energy mix. As of FY2025, the fertilizer sector has the highest dependence on LNG at 86%. This is due to the dependence of various sectors such as CGD, Power, Fertilizer, Refinery, and Sponge on LNG. Other sectors such as Iron and Steel also rely on LNG to varying degrees, as shown in Table 1, below.

Table 1: LNG dependency in FY 2025 across various NG consuming sectors[10]

LNG dependency in FY2025				
CGD	**Power**	**Fertilizer**	**Refinery**	**Sponge Iron/Steel**
33%	31%	86%	71%	64%

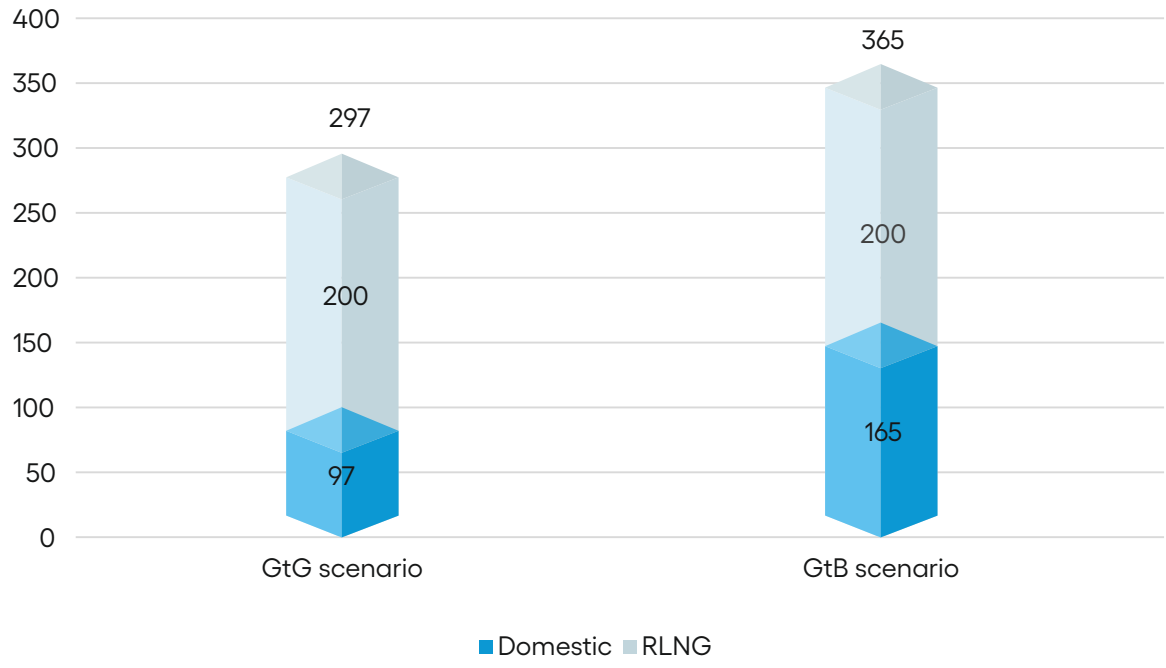
Future scenario to 2040

As per the paper titled 'India's natural gas demand projection for 2030-2040' by India's Petroleum and Natural Gas Regulatory Board (PNGRB), gas demand is expected to increase to 297 MMSCMD by 2030 in a GtG (Good to go) scenario and 365 MMSCMD by 2030 in a GtB (Good to best) scenario. Further, the natural gas demand is projected to be 495 MMSCMD in the GtG scenario and 630 MMSCMD in the GtB scenario by 2040. From 2030 to 2040, the majority of the growth (more than 50%) in natural gas demand is expected to come from CGD alone.

[9] *Source: PPAC*
[10] *Source: PPAC*

PNGRB's paper expects that the supply of domestic gas would be 97 MMSCMD by 2030 in GtG scenario, whereas it may rise to 165 MMSCMD by 2030 in GtB scenario. As demand is expected to grow significantly by the years 2030 and 2040, dependence on LNG will increase to bridge the demand-supply gap. Such a growth would result in the doubling of LNG imports by 2030, as illustrated in Figure 7, below.

Figure 7 : Gas supply forecast in 2030 in GtG and GtB scenarios by PNGRB (in MMSCMD)



LNG infrastructure in India

The investments in LNG sector in India is crucial, as LNG offers the following advantages:

Bridging supply gaps

Investments in LNG and LCNG are crucial for supplementing domestic natural gas production, thereby ensuring that India can meet its rapidly rising energy demand.

Cleaner fuel transition

LNG has a nearly 30% lower emission factor compared to diesel. LNG use in trucks can reduce SOx and PM (Particulate Matter) emissions by 100%, while cutting NOx emissions by up to 88% and CO_2 emissions by up to 28%, making it especially beneficial for coastal and ecologically sensitive regions. Thus, investments in this sector directly support India's clean energy transition and environmental goals.

Infrastructure development

Capital inflows into LNG and LCNG drive the expansion of terminals, pipelines, and associated logistics, thereby creating a robust infrastructure backbone for wider gas accessibility across the country.

Price flexibility and risk management

A balanced mix of spot and term contract provides the flexibility to better manage global price volatility.

Regional access

Supporting LNG trucking and LCNG stations can enable access to remote and non-pipeline-connected regions, improving energy inclusion and accessibility.

Industrial growth

LNG and LCNG play a vital role in powering key sectors such as power generation, fertilisers, and CGD, contributing to industrial and economic growth.

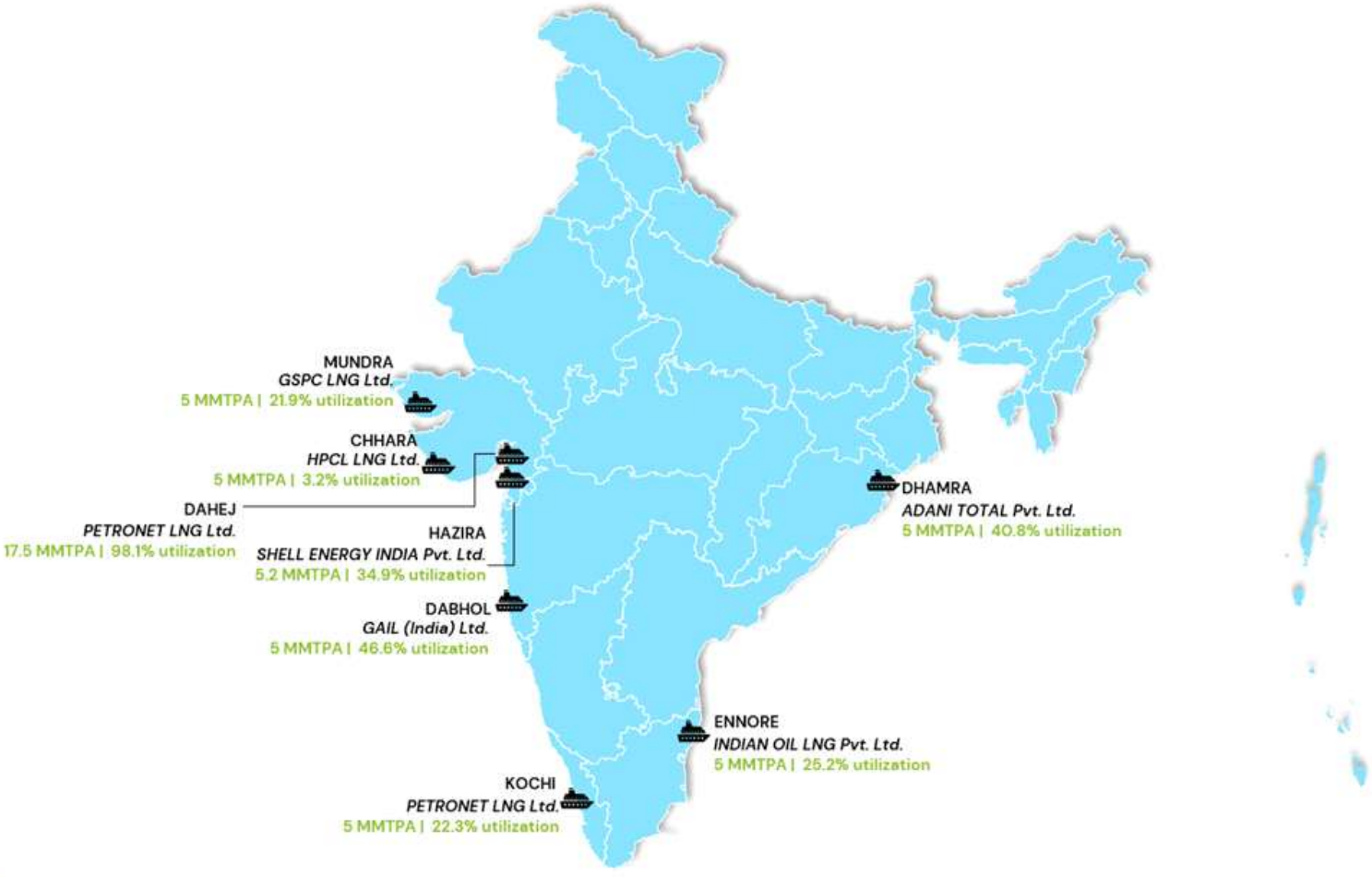
Several major players are actively investing in LNG and LCNG infrastructure in India. The list of such major players is provided in Figure 8 below.

Figure 8: Major players investing in LNG/LCNG infrastructure space in India

LNG regasification terminal

As of March 2025, India has eight operating RLNG terminals with a regasification capacity of 52.7 MMTPA and an overall utilization rate of 51.20%. These are operated by PLL, SEIPL, GAIL, GSPC, HPCL, ATPL and IOCL. RLNG terminals in India, along with their respective regasification capacities and company is illustrated in Figure 9 below.

Figure 9: Location, Operator, Capacity, and Utilization of RLNG terminals in India[11]



India is expected to add an additional 30 MTPA of RLNG capacity, with several LNG terminals currently under construction to support this expansion. In addition to the operational and under construction LNG terminals in India, few LNG regasification terminals have been proposed/announced in India. The likelihood of such terminals depends on the growth of the overall natural gas market in the catchment areas of the planned location. A list of the LNG terminals under construction and proposed/announced is provided in Table 2 below.

[11] *Source: PPAC*

Table 2: Under-construction and proposed/announced RLNG terminals in India

Under construction LNG terminals				
S. No.	**Location**	**State**	**Operator/ Owner**	**Capacity, MMTPA**
1	Dahej (Capacity expansion of existing terminal)	Gujarat	Petronet LNG Ltd.	5
2	Jafarabad	Gujarat	Swan LNG	5
Total Capacity - Under construction LNG terminals				10
Proposed/Announced LNG terminals				
1	Gopalpur	Odisha	Petronet LNG Ltd	4
2	Kakinada	Andhra Pradesh	Crown LNG	7.2
3	Haldia	West Bengal	H Energy	5
4	Karaikal	Tamil Nadu	AG&P	4
Total Capacity - Proposed/Announced LNG terminals				20.2

LNG in transport

Although medium and heavy-duty vehicle (MHDV) trucks form only 3% of the overall transport vehicle fleet, they accounted for 34% of overall road transport CO_2 emissions and 53% of PM emissions in 2022. LNG is emerging as a sustainable alternative to diesel in long-haul transportation, as it provides a viable alternative for decarbonising the long haul and heavy transport segments. The government is also exploring measures, including potentially supplying cheaper domestic natural gas, to revive and accelerate LNG adoption in the heavy-duty truck segment. There are currently ~38 LNG refuelling stations (with another ~30 in development) and more than 1,000 LNG fuelled HDVs operational in the country. The government is actively working towards increasing the adoption of LNG in the country. According to draft policy released in Sept'2024 by the federal oil ministry, India plans to have a third of its heavy-duty long-haul trucking fleet fuelled by LNG instead of diesel in five to seven years (i.e., by 2031) to cut pollution. Indian oil and gas retailers are setting up 49 LNG refuelling stations in the initial phase with a target of 1,000 LNG refuelling stations on all major roads, industrial hubs and mining areas. The growing investments in India's LNG and LCNG sector are of strategic importance, addressing the country's rising energy demand through infrastructure expansion, greater regional accessibility, and overall industrial growth.

LNG bunkering

With its extensive coastline and strategic location along major international shipping routes, India holds strong potential to capitalize on this transition. However, the LNG bunkering market in the country is still at a nascent stage. While LNG terminals have been developed on both the east and west coasts, actual bunkering activity remains virtually absent. The only documented case took place in 2015, when two Norwegian LNG-fuelled vessels were refuelled at Kochi. Since then, progress has stalled, with India yet to put in place the requisite infrastructure and regulatory framework needed to enable large-scale adoption of LNG as a marine fuel. LNG bunkering for small ships is one opportunity for exploring inland waterways in India.

Major challenges

This section outlines the key challenges impacting India's large-scale adoption of LNG across both transportation and industrial sectors, highlighting policy gaps, infrastructure constraints, and cost-related barriers.

Lack of level playing field for LNG

There exists a policy imbalance in the clean mobility sector between electric vehicles and LNG vehicles. While electric vehicles benefit from strong support from the government in the form of a well-established policy and incentive framework under FAME, the absence of any such policy for LNG impedes its widespread adoption. LNG/LCNG are ideal for long-haul HDVs and have a faster refuelling rate, with emissions much lower than diesel. LNG not being a part of any major clean mobility scheme, along with limited government incentives and infrastructure investment, impacts the uptake of LNG vehicles despite several advantages.

Price volatility of LNG

Diesel retail prices in India remain stable as oil marketing companies (OMCs) absorb global price fluctuations, whereas LNG retail prices directly reflect global spot volatility, which is higher than crude or diesel. This uncertainty, coupled with the higher upfront cost of LNG-based M&HDVs, weakens their value proposition and discourages fleet owners from adopting LNG as an alternative fuel.

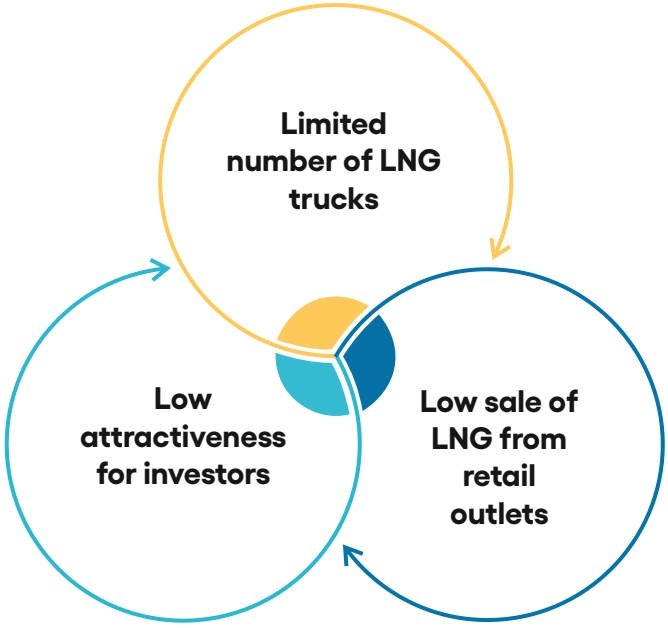
Boil off gas

Boil off gas (BOG) naturally forms as a result of continuous heat ingress into LNG during its storage, transport, and handling. Since LNG is kept at cryogenic temperatures (approximately -162°C), some degree of heat transfer is unavoidable even with sophisticated insulation systems. This leads to the evaporation of a portion of LNG and the generation of BOG. For LNG refueling stations, the inability to economically handle BOG discourages investment. In the current scenario, BOG losses for LNG refuelling stations can be as high as 30-40% of the stored LNG. BOG also results in a lower range of LNG trucks, impacting driver anxiety. LNG truck drivers suffer an LNG loss of about 15-20% of the tank size per refuel.

Setting up LNG refuelling stations

The challenges involved in setting up an LNG refuelling station are listed below:

- High investment risks due to the limited number of LNG-fuelled trucks currently operating in the country. This restricts the sale of LNG from retail outlets, reducing station utilisation, which impacts the financial viability.
- Constrained hours of operation, since night operations are not allowed in LNG terminal or LNG refuelling stations for the loading or unloading of tankers. This impacts the available capacity and leads to a 12-hour delay.
- Complicated multi-window approvals required to start LNG refuelling stations, with more than four major agencies viz. District Magistrate, PESO, NHAI, DISH, Gram Panchayat & Town Planning/ULB and six to eight sub departments within DM.
- Lengthy and complex approval processes from multiple authorities delay project implementation. Typically, it may take up to 630 days to set up an LNG refuelling station.



Vicious cycle of dependency in setting up LNG refuelling stations

Lack of connectivity of terminals with NGPL network

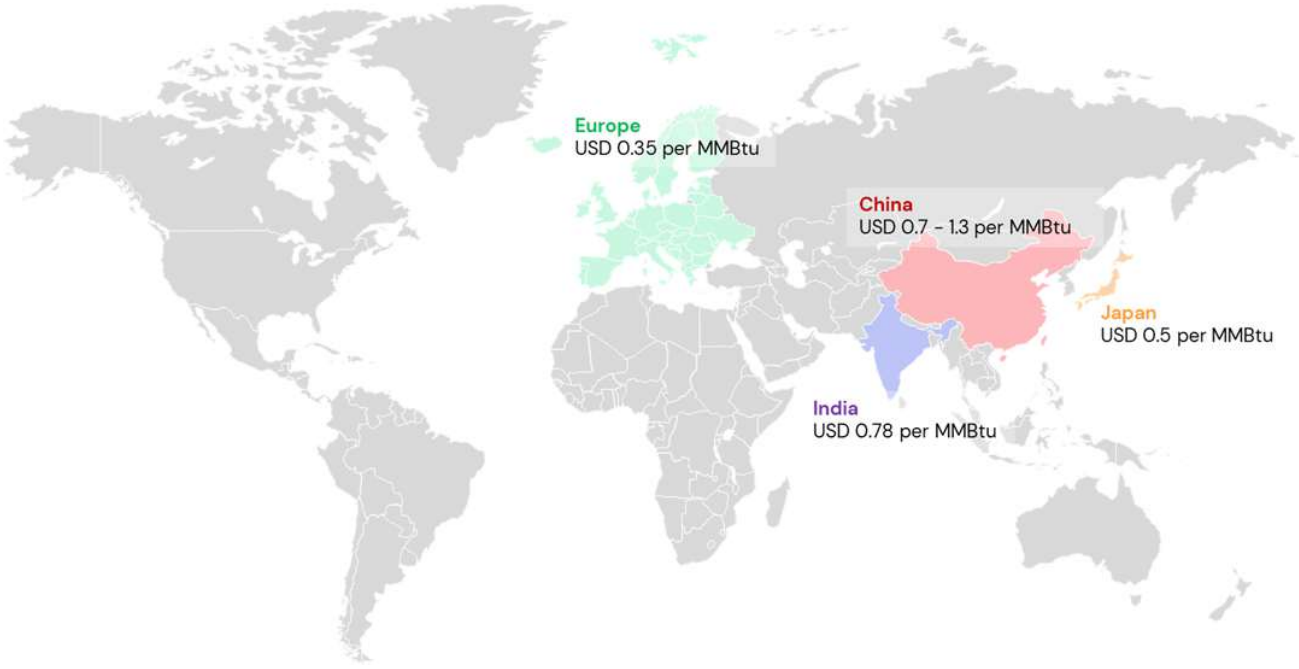
- LNG terminals such as Ennore and Kochi face connectivity issues with the national gas pipeline grid, restricting the seamless transfer of gas to demand centers.
- Inadequate connectivity leads to higher reliance on costly and inefficient modes of transport, like LNG by trucks, especially for industries in remote regions.
- Inadequate pipeline linkages leave expensive LNG terminal infrastructure underutilised, delaying returns on investment and discouraging further development.

High regasification charges in India

Regasification charges in India are among the highest across the world. The regasification charges for the LNG regasification terminals situated on the west coast is Rs. 66/MMBtu or 0.78 USD/MMBtu. Such high charges coupled with annual escalation in charges by 5% each year, would further raise the prices to Rs. 84 (1 USD/MMBtu) by 2030.

A comparison of global LNG regasification tariffs highlights regional variations, revealing relatively higher costs prevailing in India, is provided in the figure 11 below.

Figure 11: Comparative global regasification charges



- **Europe -** The 9.2mn t/yr Gate terminal in Netherland charges around USD 0.35 per MMBtu for unloading and regasification, while Spain is much lower.
- **Japan -** Regasification rates in Japan LNG terminals are around USD 0.5 per MMBtu, while rates at terminals operated by Jera, like the 22.9mn t/yr Futtsu LNG facility are much lower.
- **China -** Regasification rates in China, however, are higher at par with that in India. PipeChina's eight LNG terminals are charging USD 0.7 to 1.3 per MMBtu for unloading and regasification.

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