पी एन जी आर बी
PNGRB





INDIA'S NATURAL GAS DEMAND PROJECTION FOR 2030-2040

An excercise undertaken to plan Natural Gas Infrastructure

India's Evolving Natural Gas Landscape

Natural Gas has been a key pillar of India's energy mix, playing a vital role in the country towards cleaner and more sustainable energy sources. As a versatile and environmentally friendly fuel, it serves as a bridge between conventional fossil fuels and renewable energy, offering a lower-carbon alternative that supports India's long-term energy security and sustainability goals.

India's rapid economic growth, increasing urbanization, and the sharp rise in industrial and manufacturing activities under the **'Make in India'** initiative position natural gas to play an even greater role in the country's energy landscape.

As India seeks to reduce its dependence on oil imports and its presence in evolving global energy markets, this study provides an overview of key potential growth segments, including City Gas Distribution (CGD), refineries, industrial and manufacturing sectors, and LNG as a trucking fuel.

The report highlights extensive CGD infrastructure development across the country under various CGD rounds, with 307 Geographical Areas (GAs) authorized by the Petroleum and Natural Gas Regulatory Board (PNGRB) covering entire country except Islands. PNGRB has also authorised ~33,500 km of Natural Gas Pipeline (NGPL) networks with operationalised of ~ 25,000 km of pipelines, including Common Carrier Tie-in Connectivity, dedicated pipelines, and sub-transmission pipeline for supply of natural gas to industries and CGD networks.

Favourable global market trends for LNG availability, continuous infrastructure expansion, rising economic activities, and supportive policies are expected to contribute significantly to the increased adoption of natural gas across various sectors.

This report aims to provide insights into probable future trends, with natural gas emerging as a key component of the energy mix. It serves as a thought-provoking guide for policymakers, infrastructure developers, LNG providers, and consumers to take strategic action, seize LNG influx opportunity, and align with broader energy security, decarbonisation, and sustainability goals.

In preparing this report, PNGRB has considered various research studies and industry publications, including reports by ICF, Deloitte, IEA, and data report from the Petroleum Planning & Analysis Cell (PPAC) and discussions with other stakeholders.

Acknowledgement

I would like to begin by expressing my heartfelt gratitude to Dr. Anil Kumar Jain, IAS (Retd.) Chairperson, PNGRB, for his invaluable guidance, mentorship, and constructive feedback, which have played a pivotal role in shaping and completing this study.

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Deputy Director, PNGRB

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Executive Summary

Natural Gas has been a critical component of India's energy basket due to its inherent environmentally friendly properties. The key driver for adoption of Natural Gas (NG) is availability and affordability NG, transport and distribution infrastructure. There is a vital role of inducive environment and policies to shift towards cleaner fuels.

The PNGRB has played a pivotal role in developing gas infrastructure in the country. With 307 Geographical Areas (GAs) authorized, covering the entire country except islands, it ensures widespread access to natural gas across domestic, commercial, industrial, and transportation segments. PNGRB continues to monitor progress and engage with state authorities for policy interventions to support the adoption of natural gas.

This paper outlines the projected natural gas consumption in various segments such as fertiliser, power, refineries, petrochemical, other industrial & commercial establishments, households as well as CNG and LNG as transport fuel in the energy basket through 2030 and 2040. There are reasonable time periods to plan and construct pipelines. As PNGRB has a direct role in rolling out CGD infrastructure, this sector is of major focus in this study.

In view of inter-play of several factors, it would be advisable to consider NG demand under a scenario-based approach. Therefore, PNGRB has estimated NG demand under two scenarios based on present trend and more favorable one.

- In the **(Good to Go) scenario–** Represents the **GtG** scenario, assuming moderate growth and expected developments based on current trends and commitments. India's natural gas consumption is expected to reach **297 MMSCMD by 2030** and **495 MMSCMD by 2040**.
- In the **(Good to Best) scenario –** Represents the **GtB** scenario, considering accelerated progress, favourable policy implementation, and enhanced investments leading to higher-than-expected growth**.** In the GtB scenario, India's natural gas consumption is expected to reach **365 MMSCMD by 2030** and **630 MMSCMD by 2040.**

The CGD sector is expected to be the primary growth driver, with consumption projected to grow **2.5 to 3.5 times by 2030 and 6 to 7 times from base of ~37** mmscmd in FY 24 by the year 2030 and 2040 respectively.

Upsurge in Refinery and Petrochemical, especially renewed focus on petrochemical integration will provide new growth leg. Consequently, the petrochemical sector is expected to contribute significantly, as the Petroleum Intensity Index is projected to improve 15% by 2030 and 25% by 2040.

Power generation is expected to grow, with moderate rate, respectively, driven by peak demand management, enhanced grid reliability, and greater flexibility.

The Fertiliser sector is projected to grow moderately, already with a high consumption base. The Iron and Steel industry and 'Others' segment is projected to grow moderately.

LNG as a long-haul transportation fuel could be a game changer, with the potential to play a pivotal role in replacing Diesel. LNG trucking is projected to gain momentum post 2030, with the potential to emulate China's success in reducing diesel dependency.

India's LNG imports are set to more than double by 2030, driven by increasing demand and relatively slower domestic production growth. Currently, India's natural gas production meets only ~50% of its demand. As demand is expected to multiply significantly by 2030 and 2040, dependence on LNG will increase exponentially to bridge the demand- supply gap. With the expected increase in global LNG availability, there is a significant opportunity for long-term supply, leading to structurally lower prices.

Achieving India's projected natural gas targets for 2030 and 2040 will require a **continued commitment from entities towards infrastructure expansion, favourable LNG pricing, and conducive policies.** However, geopolitics, policy uncertainty, volatility in gas prices cannot be ignored.

Chapter – 1

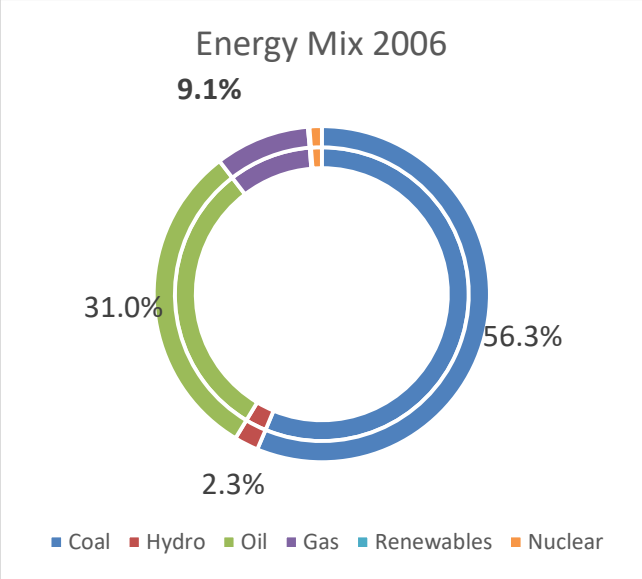
1.1 INTRODUCTION

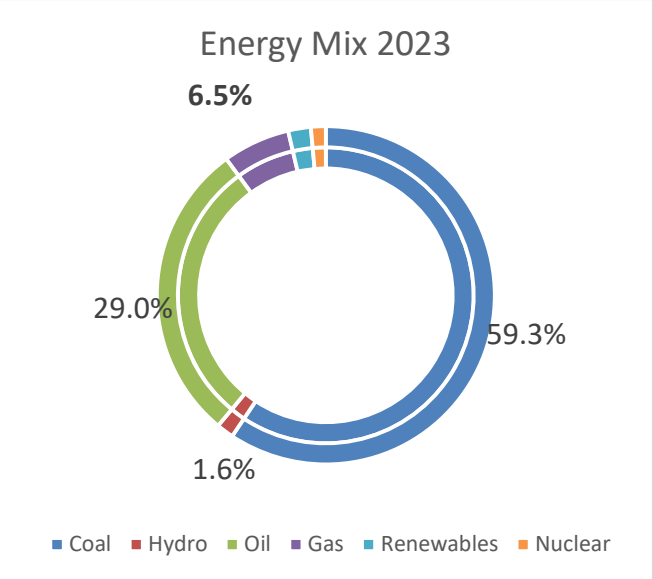
Natural Gas holds significant potential in shaping the early stages of India's extended decarbonization journey, offering a dual advantage of meeting the country's rapidly growing energy demand and shifting away from polluting fuels.

Recognizing this potential, the **Government of India has set an ambitious goal** to increase the share of natural gas in the country's energy mix from **6% to 15% by 2030**. This target serves as a strong signal for potential and growth in the natural gas sector.

The role of natural gas (NG) in the energy mix is expected to expand by the end of the project year 2030 and 2040. Various gas demand projections indicate unprecedented growth in NG consumption, driven by extensive infrastructure development in the country and policy intervention and support.

Historically, India's natural gas consumption has double in last two decades, presently, hovering around 188 mmscmd, though its percentage contribution to the energy mix has remained range bound.





Source: iced.niti.gov.in

With several LNG projects nearing completion in the USA, there will be a surge in LNG supply and affordability, leading to boost in consumption of NG. The ever-increasing NGPL and CGD infrastructure will catalyze demand into reality.

1.2 SECTOR ANALYSIS

The historical sectorial trend is tabulated below:

	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23	FY 23-24	CAGR	FY* 23-24	FY* 24-25	% growth
Power	29.8	31.83	32.95	32.89	30.27	29.69	27.83	22.34	24.81	**-2.2%**	26	27	**5%**
CGD	14.9	20.14	23.52	25.22	29.74	25.29	33.36	32.95	36.86	**12.0%**	36	41	**13%**
Refinery	13.9	14.72	17.9	19.31	21.27	21.67	14.55	10.71	15.95	**1.8%**	15	17	**11%**
I?C for P/L System	1.1	1.29	1.358	1.48	1.43	1.20	1.33	4.83	5.26				
Agriculture(Tea Plantation)	0.0	0.00	0.517	0.53	0.55	0.49	0.43	0.42	0.39	**-4.6%**			
Industrial	1.1	1.89	2.392	2.59	1.55	1.23	2.27	1.85	2.86	**12.7%**			
Manufacturing	0.4	0.29	0.346	0.39	0.36	0.29	0.33	0.52	1.13	**14%**			
Other/Misc	11.7	10.77	8.84	9.29	11.50	12.52	24.96	23.38	29.88	**12.4%**			
Non Energy Sectors													
Fertilizer	44.1	42.27	40.21	41.06	44.03	48.72	49.53	53.15	57.50	**3.4%**			
Petrochemical	10.2	11.42	11.03	9.28	9.75	8.42	7.85	5.37	7.29	**-4.1%**	7	9	**20%**
LPG Shrinkage	2.1	2.08	2.186	2.39	2.34	2.46	2.93	2.67	2.74	**3.6%**			
Sponge Iron/Steel	1.5	2.42	3.501	3.08	1.55	1.77	3.11	2.63	3.22	**10.1%**	3	4	**19%**
Total	**130.7**	**139.1**	**144.7**	**147.5**	**154.35**	**153.7**	**168.47**	**160.8**	**187.8**	**4.6%**	**185**	**199**	**7%**

Source: PPAC

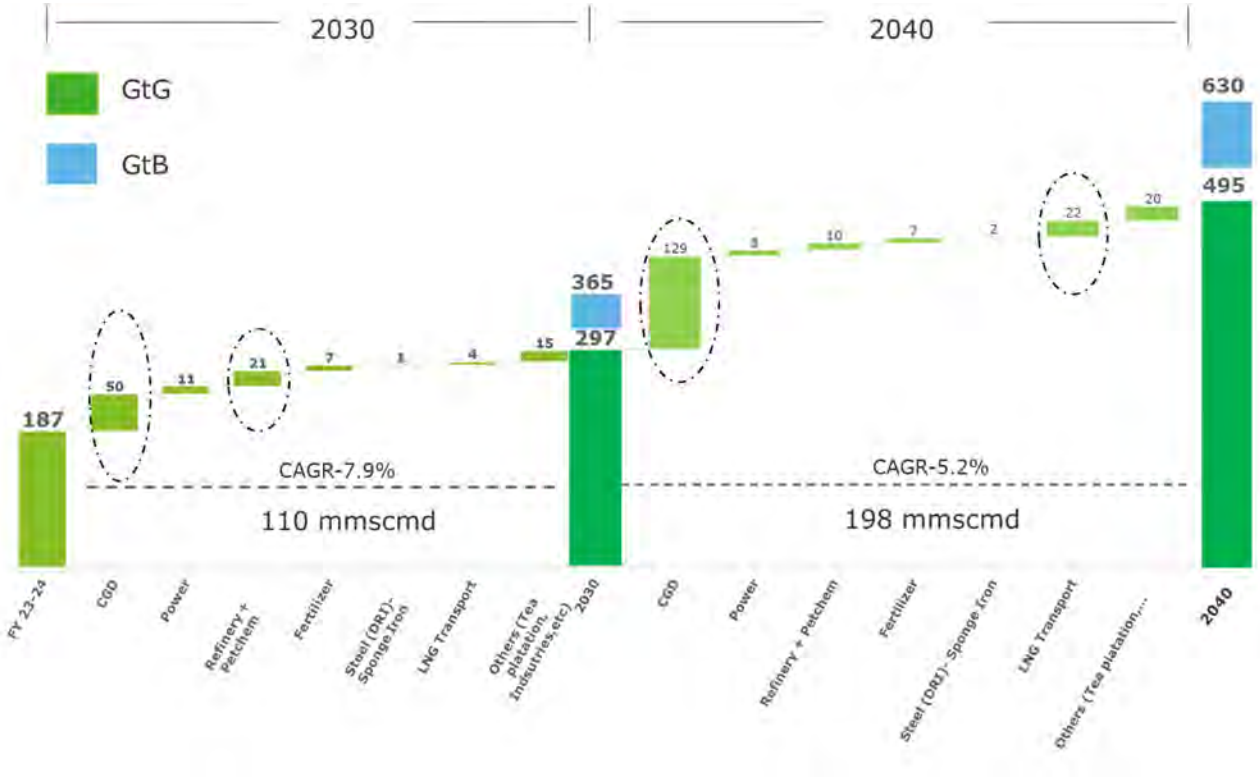
Key trends (Over FY-16):

- NG consumption has increased from ~131 mmscmd to ~188 mmscmd in FY-24, with 45% growth.
- Power Sector: Declining trend with a negative CAGR of -2.2% up to FY-23.
- City Gas Distribution (CGD): NG consumption has more than doubled, growing at a CAGR of 12%.
- Refinery Sector: Modest growth at a CAGR of 1.8% up to FY23; however, a significant uptick in NG consumption thereafter.
- Fertilizer: Modest growth with a CAGR of 3.4%.
- Petrochemical: Declining trend with a CAGR of -4.1% up to FY23, followed by a sharp uptick thereafter.
- Sponge Iron/Steel: Growing steadily at a CAGR of 10.1%.

Chapter - 2

2.1 Projection of Natural Gas: 2030 & 2040

The chart illustrates the projected growth of natural gas consumption across different sectors from FY 23-24 to 2040, under **GtG** and **GtB** scenarios.



1. **Projected Year 2030**: **GtG and GtB**
   - Under the GtG scenario, the consumption of natural gas is expected to reach **297 mmscmd by 2030**. This reflects a **CAGR of ~8%** from the base of FY 23-24. The GtB assumes a more favorable and aggressive adoption of natural gas, with consumption potentially surpassing **360 mmscmd by 2030**, with a higher **CAGR of ~12%.**
   - CGD playing a prominent role, with traction in Refinery and Petrochemical and other segment adding the growth.
2. **Projected Year 2040: GtG and GtB**
   - GtG consumption is projected to reach **~495 mmscmd,** growing at a **CAGR of ~ 5.0%** after **2030. In the GtB,** consumption could reach **630 mmscmd,** reflecting a **CAGR of ~8%.**
   - CGD becoming a key contributor in both the projection scenarios. LNG as a trucking fuel emerging as a prominent sector from 2030 onwards.

Chapter – 3

Natural Gas consuming sectors

3.1 City Gas Distributions

A City Gas Distribution (CGD) network is the interconnected network of pipelines to supply of natural gas to domestic, industrial or commercial premises and CNG stations situated in a specified Geographical Area (GA). CGD network ensures the supply of environment friendly cooking fuel at the doorstep of domestic households in the form of Piped Natural Gas (PNG) as well as clean fuel to transport sector in the form of Compressed Natural Gas (CNG).

As the fastest-growing sector, it is driven by infrastructural development in the 307 authorized Geographical Areas (GAs) through various bidding rounds conducted by PNGRB.

Infrastructure development, urbanization, and rising economic activities have driven strong demand in the D-PNG (Domestic Piped Natural Gas) and CNG (Compressed Natural Gas) segments, as well as the Industrial and Commercial segments.

The details of various round under which commitment for D-PNG, CNG and Pipeline infrastructure has been contracted by authorised entities.

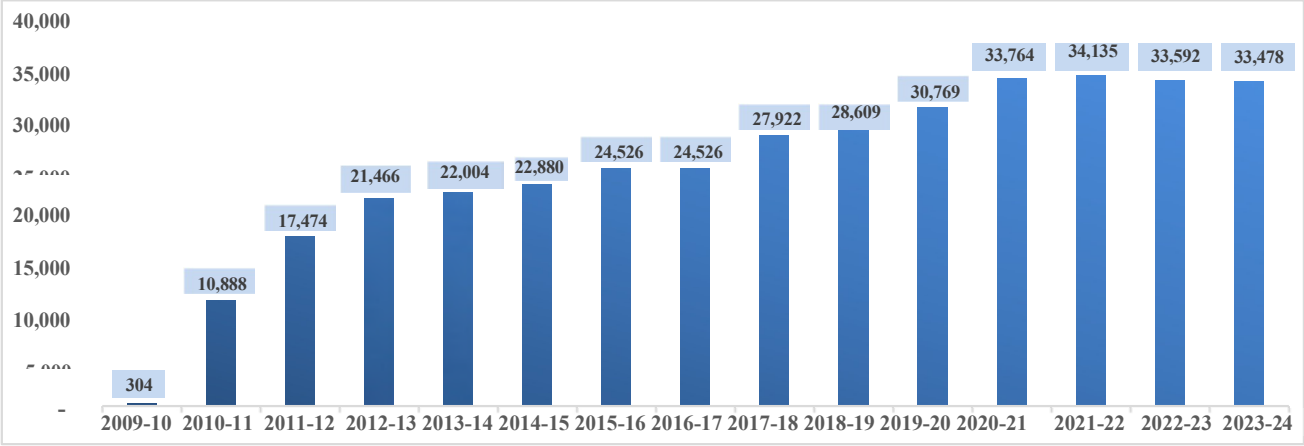
Round/ Regulation	No. of GA	Domestic PNG Connections (Nos)			CNG Stations (Nos)			Pipeline Infra (inch-km)		
		Total MWP Target	Pro-Rata Target *	Achievement	Total MWP Target	Pro-Rata Target	Achievement	Total MWP Target	Pro-Rata* Target	Achievement
Round 1	6	4,40,000	4,40,000	2,45,875	30	30	93	2,605	2,605	3,385
Round 2	3	9,48,706	9,48,706	74,805	-	-	53	2,302	2,302	2,407
Round 3	6	16,51,200	16,51,200	1,42,309	-	-	97	1,26,013	1,26,013	1,804
Round 4	9	3,45,164	3,45,164	5,39,057	-	-	341	10,037	10,037	20,479
Round 5	8	2,99,013	2,99,013	2,58,419	-	-	119	12,271	12,271	12,781
Round 6	18	2,32,573	2,22,723	3,27,557	-	-	372	21,020	20,427	26,125
Round 7	1	43,658	43,661	34,619	-	-	23	1,800	1,800	1,018
Round 8	6	1,08,102	95,354	96,935	-	-	123	5,945	5,717	7,456
Round 9	86	2,21,16,702	50,52,029	11,45,857	4,603	1,575	1,962	1,16,171	55,196	62,269
Round 10	50	2,02,92,760	47,18,098	6,35,917	3,578	1,244	1,121	58,177	27,885	40,182
Round 11 & 11A	67	7,05,57,571	61,05,805	1,13,393	9,540	1,176	652	1,33,836	25,998	9,900
Round 12 & 12A	7	13,31,793	-	-	585	-	-	4,643	97	-
Regulation 17	20	48,24,378	37,74,989	71,89,875	-	-	1,728	26,777	21,692	43,739
Regulation 18	13	25,59,881	24,63,561	24,83,786	-	-	488	14,242	13,723	23,458
Section 16	1	4,03,853	2,87,330	1,35,221	-	-	32	673	-	5,213
Section 42 & 16	6	2,00,464	1,81,327	3,49,510	-	-	122	10,355	10,010	8,738
Grand Total	307	12,63,55,818	2,66,28,959	1,37,73,135	18,336	4,025	7,326	5,46,867	3,35,772	2,68,954

Note: Data as on November 2024.

The accomplishment of MWP of 12.6 crore D-PNG connections, 18,336 CNG stations and 5.4 lakh of inch-km may take NG consumption to a new trajectory.

NGPL infrastructure development:

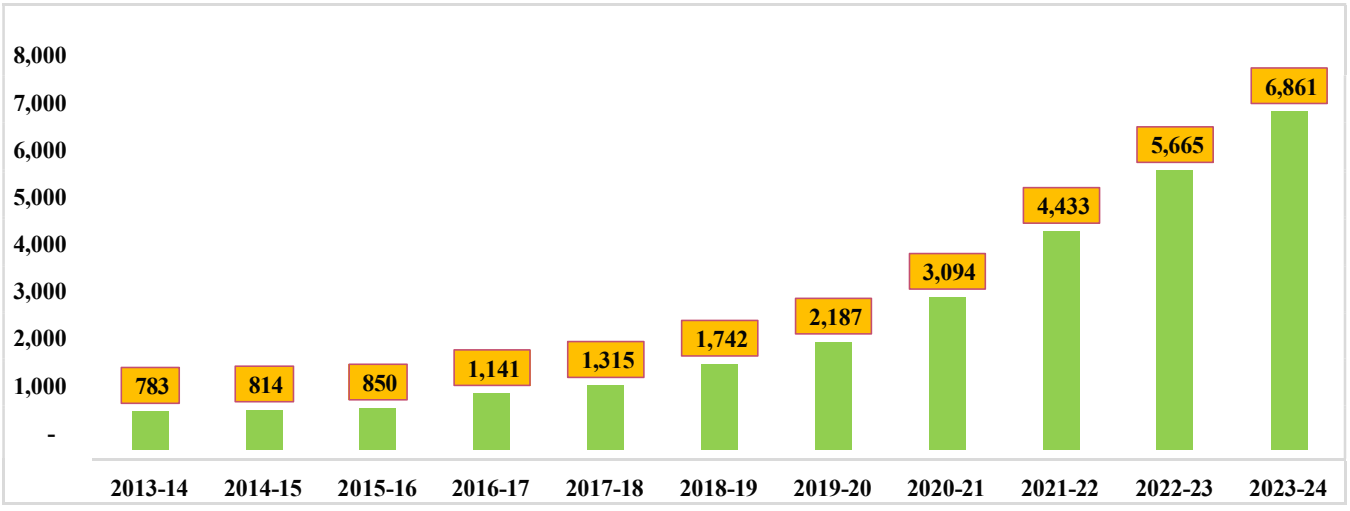
Gas Pipeline infrastructure is the most economically feasible and safe mode of transporting natural gas by connecting gas sources to gas consuming markets. To expand gas infrastructure in the country, PNGRB has also authorised ~33,500 km of Natural Gas Pipeline (NGPL) networks with operationalised of ~ 25,000 km of pipelines. The name plate capacity of pipelines is 722 mmscmd, carrying capacity of operational pipeline is assumed ~400 mmscmd**.** The gap between name plate and operational is due to upstream supply dependencies, partially completed pipelines, downstream constraints and design limitations. The historical NGPL infrastructure development is given below:



CNG infrastructure development:

The rapid expansion of CNG infrastructure has been a major driver of growth. The number of CNG stations have **increased 9 times** since FY 14 and this growth is expected to sustain.

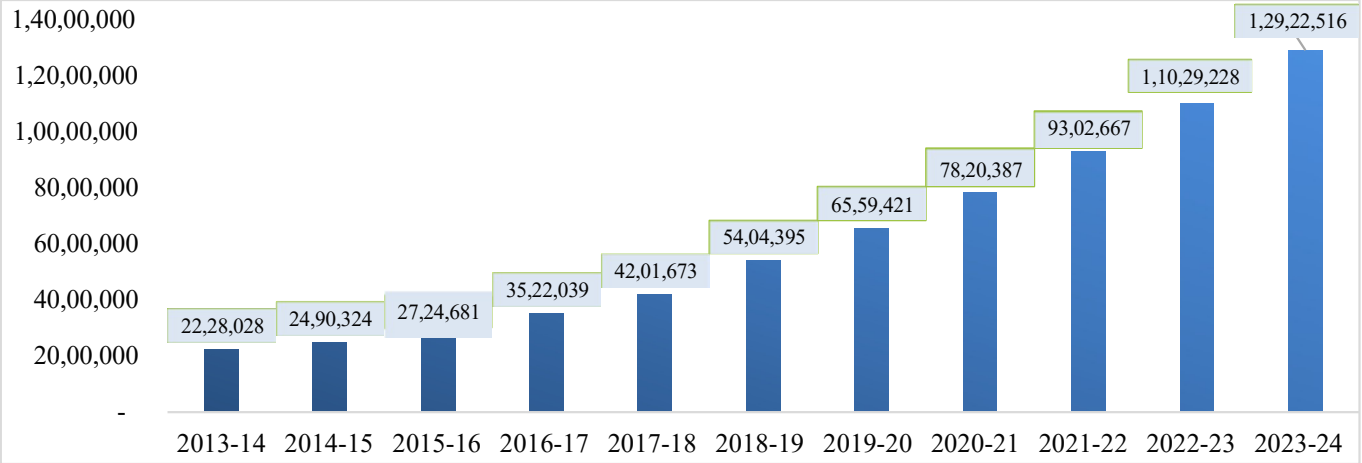
CNG Four-wheeler segment is **growing at a decadal rate of 12%**, while the **CNG Three-wheeler segment, CNG segment is expanding at 43% over the same period**. Even, Two-wheeler segment -CNG segment has started gaining traction following the launch of India's first CNG- powered bike. Meeting MWP target of 18,336 would enable NG consumption of ~57 mmscmd from the existing base of 21 mmscmd in FY 24. The historical CNG infra development is given below:



NG Demand projections for 2030 and 2040

D-PNG progress:

D-PNG connections **increased 6 times** between FY 14 to FY 24. Further, meeting MWP target would enable 1.29 crore connections, with projected natural gas consumption of ~40 mmscmd. The historical D-PNG progress is given below:

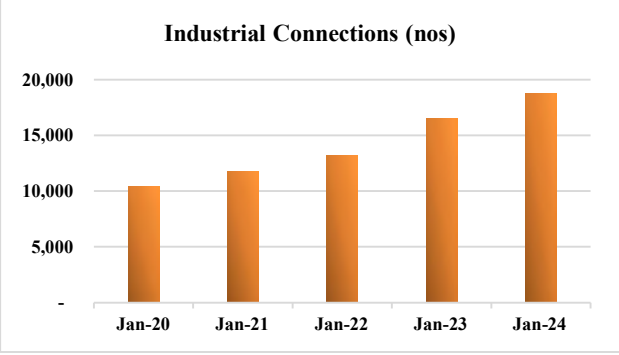


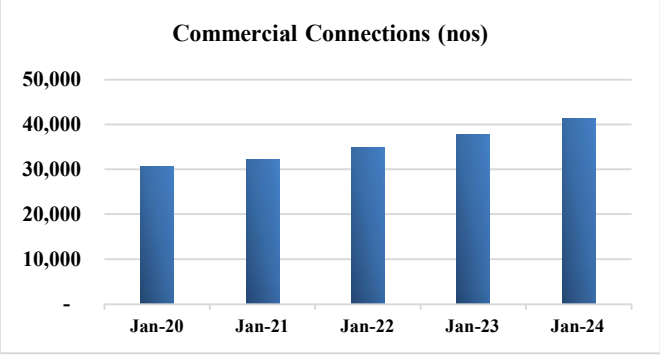
Industrial & Commercial (I&C) projections:

Under the ambit of CGD, I&C is expected to grow at a CAGR of 10% under GtG and 15% under GtB in the projected year 2030 and thereafter 10% under GtG and 12% under GtB in projected year 2040.

Industrial segment has a base of 18,700 units and 41,000 units of commercial consumer base with consumption of ~12.7 mmscmd FY 24. As per Industries estimate, there are more than 12,000 industrial clusters within GAs, with potential of 2.0 lakh small and medium industries and ~1.0 lakh commercial customers.

NG can be expected to incrementally replace polluting (and expensive) fuel like Naphtha, FO, LPG, Propane etc. This segment has potential to surprise considering rapid industrialization activities, Government focus on manufacturing and shift towards cleaner fuel. The past progress is given below:





Summary

As PNGRB has played a pivotal role in licensing 307 authorized Geographical Areas (GAs), excluding islands, the continuous development of CGD infrastructure by authorized entities will act as a catalyst for natural gas consumption by serving end consumers. NG demand in the CGD segment is a function of the increasing penetration of DPNG connections, the expansion of CNG infrastructure, and connectivity to I&C consumers.

CGD remains the primary growth driver for NG demand projections for 2030 and 2040 and will play a crucial role in shaping future NG consumption trends across various demand projection scenarios. Therefore, sustained commitment from authorized entities to infrastructure expansion is essential for the long-term growth of the CGD sector.

There is a clear roadmap for entities outlining a Minimum Work Program (MWP), which includes targets for providing 12.6 crore DPNG connections, 18336 CNG stations, and laying of 5.45 lakh inch-km of pipeline.

The CGD sector is expected to be the primary growth driver, with consumption projected to grow 2.5 to 3.5 times by 2030 and 6 to 7 times from base of ~37 mmscmd in FY 24 by year 2030 and 2040 respectively.

Natural Gas consuming sectors

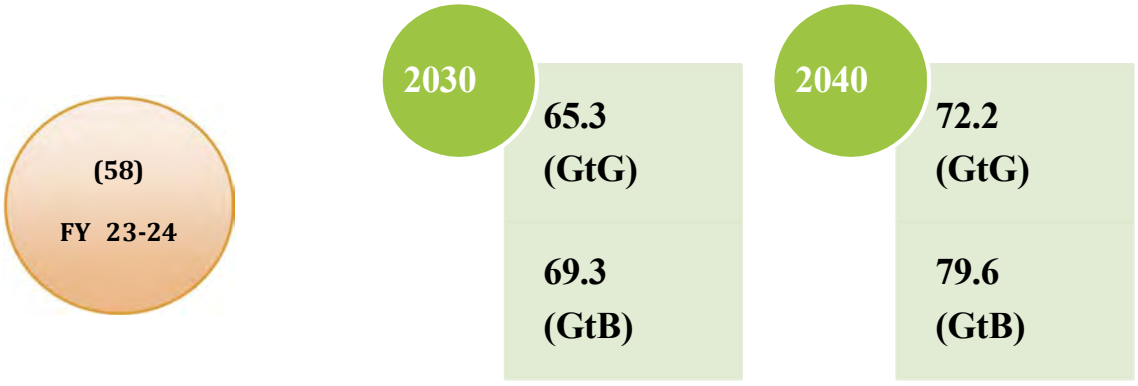
3.2 Fertiliser

There are 36 gas-based Urea plants having **a capacity of 28.4 MMT**. The fertilizer segment is the largest consumer of natural gas, **consuming ~ 58 MMSCMD as a feedstock for ammonia-based urea production.** It is important to become self-reliant in urea production which is critical for agricultural industry and food security. Currently, **15-20% of Urea demand is met through import.**

Government has revived the closed Fertilizers plants to reduce urea imports and ensure domestic availability. The revival plan focuses on natural gas-based fertilizer production plan. The commissioning of **Urja-Ganga pipeline sections**, enable to connect **Sindri Fertilizers Plant, Jharkhand, Barauni Fertiliser plant, Bihar, Gorakhpur Fertiliser plant, UP and Matrix Fertliser plant, West Bengal (Greenfield project).** Ramagundam Fertilizers plant, Telangana is connected **with Partially commissioned of Mallavaram- Bhopal- Bhilwara-Vijaipur pipeline.** This segment grows at moderate rate as the segment is agnostic to price fluctuation of LNG prices. Moreover, there is a move to promote balanced soil nutrition in agriculture with a higher uptake of Phosphorus (P) and Potassium (K).

Despite declining domestic gas allocation and increasing dependency on LNG, government subsidies keep the farmers agnostic to price fluctuations

Projections: **in mmscmd**



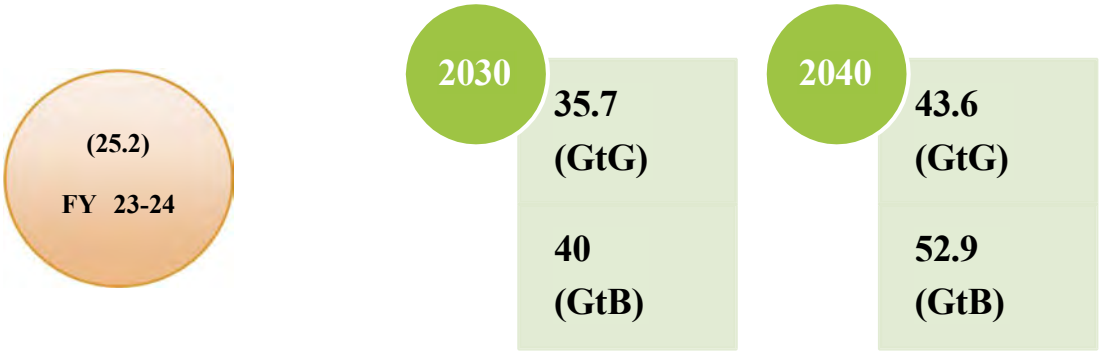
- A moderate growth is expected at CAGR of 2% in GtG, and 3% under GtB in Projected year 2030.
- A moderate CAGR of 1% is expected in GtG, and 2% under GtB in Projected year 2040.

Natural Gas consuming sectors

3.3 Power

- The installed gas-based capacity is ~**23.8 GW with load factor (PLF)** of only14.8% in FY 23-24. While power demand is primarily met through coal and renewables, gas-based power plants would play a key role in meeting peak power demand and to create reliability and flexibility of GRID.
- 31 plants with **14.3 GW capacity are stranded** are a key reason for reliance on higher-priced imported LNG. Merit Order dispatch mechanism allows cheaper units in pecking order. Therefore, peak power requirement drives the demand as Ministry of Power directs to operate all gas-based power plants at full capacity to meet peak demand, improve PLF up to 30% in 2024. However, this demand surge is largely seasonal.
- The overall drop in electricity cost due to renewable power cost, will improve consumer affordability and demand for gas-based power.
- The rising power demand will tap stranded gas-based capacities, while thermal capacity expansion gets delayed due to multiple factors.

Projections: **in mmscmd**



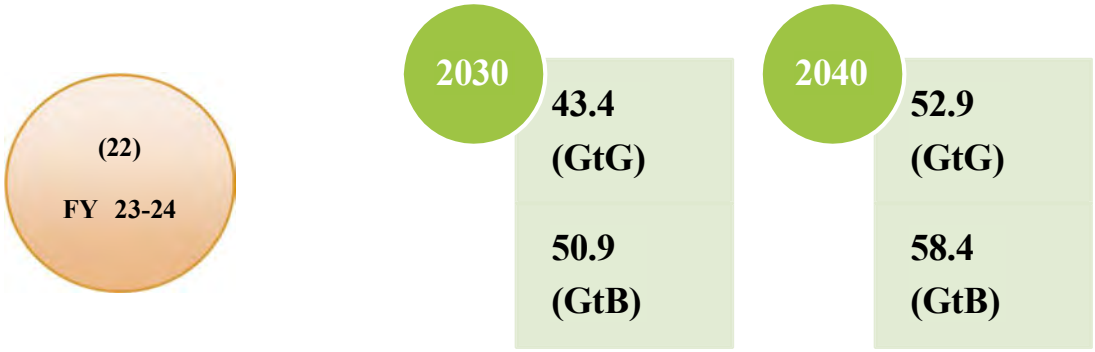
- It is projected to grow at a CAGR of 6% in the GtG scenario and CAGR of 8% in the GtB scenario by 2030 with FY 23-24 base of ~25.2 mmscmd.
- It is projected to grow at a CAGR of 2% in the GtG scenario and CAGR of 4% in the GtB scenario by 2040.
- No new facility is projected; only improvements in PLF (Plant Load Factor) are considered based on market scenarios.

Natural Gas consuming sectors

3.4 REFINERY & PETROCHEM

- The installed refinery capacity is approximately **256.8 MMTPA** as of **FY 2023-24**, with natural gas consumption around **22 mmscmd**. Natural gas is primarily used in **boilers, hydrogen generation (as feedstock), power, and heat generation**, depending on each refinery's output and installed capacity.
- **Pipeline connectivity** to **Bina, Vizag, Haldia, and Northeast refineries** will drive increased gas demand by **2030**.
- **Expansion plans** at existing refineries, including **Panipat, Koyali, Barauni, and NRL**, along with the **new commissioning of HRRL**, will further boost **natural gas consumption**.
- **New capacity additions, such as BPCL (Machilipatnam), ONGC (Prayagraj), and RRPCL- Ratnagiri, will provide significant growth momentum.**
- **Next Growth leg is Petrochemical**, owing to growing population and economic growth. As more citizens enter the middle class, the demand for a diverse range of products will drive Petrochem demand. Shift to cleaner fuel by replacing Naphtha would further drive NG consumption**.**
- **India Petrochemical capacity** is projected to increase from **29.62 Mt** to **46 Mt by 2030**.**Self-reliance** is a key driver, as **45% of petrochemical intermediates** are currently imported. The **Petroleum Intensity Index (PII)**, which measures the percentage of crude processed into petrochemicals, is expected to rise by **15% by 2030** and **25% by 2040**.

Projections: **in mmscmd**



- In Projections for 2030, it is expected to enhance installation capacity >300 MMTPA in GtG and > 350 installed capacity in GtB.
- In 2040, it is expected to enhance installation capacity >370 MMTPA in GtG and > 390 installed capacity in GtB.

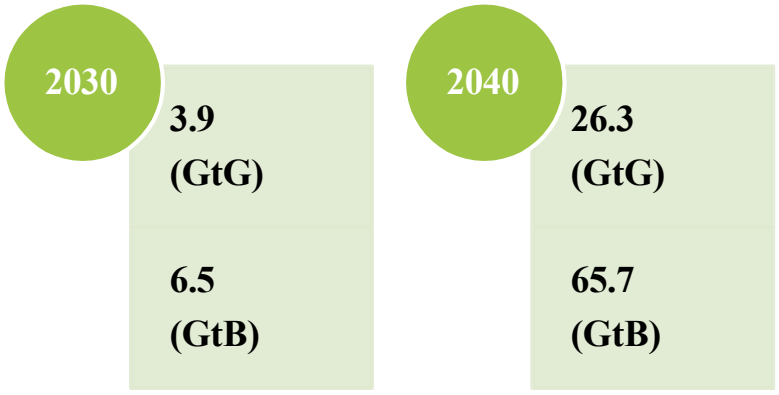
NG Demand projections for 2030 and 2040

Natural Gas consuming sectors

3.5 LNG as trucking fuel:

- This segment is at a very nascent stage in India. The Government is making efforts to accelerate its growth by mandating the opening of LNG stations and ensuring price stability through domestic gas allocation. In the journey toward decarbonizing long-haul trucking, LNG emerges as a logical, efficient, and reliable fuel source.
- India's goods carrier long haul trucking is predominated by diesel. Diesel-powered road transport contributes nearly 65% to 70% of freight and accounts for 35-40% of total road transport emissions.
- Growing economic activity and the expanding highway network are expected to significantly boost freight transport demand in the coming years. To address this, India aims to transition one-third of its heavy-duty, long-haul trucking to LNG.
- China has around 600,000 LNG-powered trucks and buses. The LNG consumption for transport has grown significantly, reaching ~82 MMSCMD in 2024, due to fall in LNG prices.
- Potential ecosystem includes tapping collective demand for OEMs to establish dedicated manufacturing lines, free road tolls, allocating domestic gas for LNG vehicles, facilitating easy financing, and reducing VAT on LNG and NG under GST etc.

Projections: **in mmscmd**



- By 2030, the number of LNG trucks is projected to reach 30,000 in the GtG scenario and 50,000 in the GtB scenario.
- By 2040, the number of LNG trucks is expected to grow to 200,000 in the GtG scenario and 500,000 in the GtB scenario.

NG Demand projections for 2030 and 2040

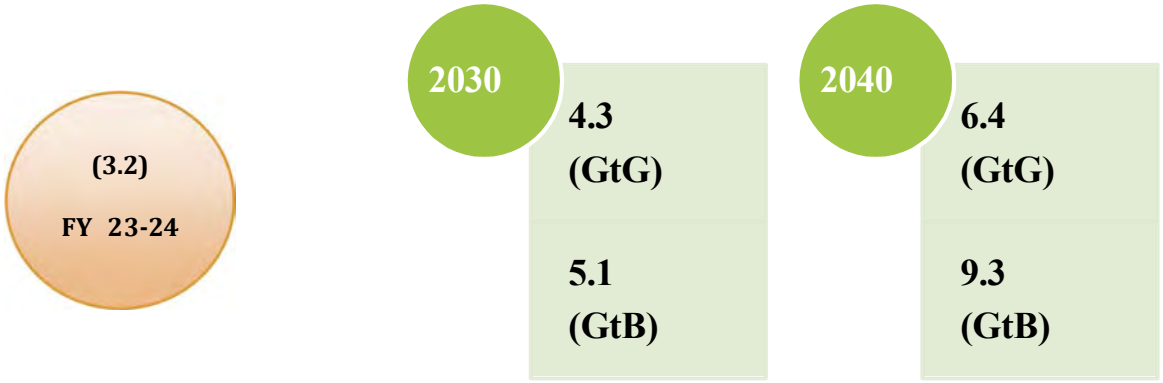
Natural Gas consuming sectors

3.6 STEEL (DRI- Sponge Iron)

India is the world's **largest producer of sponge iron**, which serves as a key raw material for steelmaking. The country produces approximately 126 MMT of steel annually and 39-49 MMT of DRI (sponge iron), primarily through the **coal-based route (~80%), and remaining ~20% is gas- based.**

- The National Steel Policy 2017 outlined several initiatives and strategies to boost steel production in India and achieve self-sufficiency in the sector.
- Major gas-based steel plants consumers include ArcelorMittal Nippon Steel India (Hazira plant, Gujarat; Paradip plant, Odisha) and JSW steel, Maharashtra.
- Sponge iron and steel production consumes approximately 3.2 MMSCMD of natural gas, with a significant reliance on LNG imports.
- India's expanding natural gas pipeline connectivity, shifting towards cleaner fuel will support the increased adoption of gas in the steel sector.
- DRI-based steel production emits approximately 50-60% less CO2 compared to traditional coal-based blast furnace steelmaking. Transitioning from coal-based to gas-based steel production can help accelerate the shift toward low-carbon steel, thereby increasing natural gas consumption.

Projections: **in mmscmd**



- A moderate growth is expected until 2030 at CAGR of 5% in GtG, and 8% under GtB scenario from the exiting base of ~3.2 mmscmd in FY 24.
- A stable growth is expected at CAGR of 4% in GtG, and 8% under GtB scenario in Project year 2040.

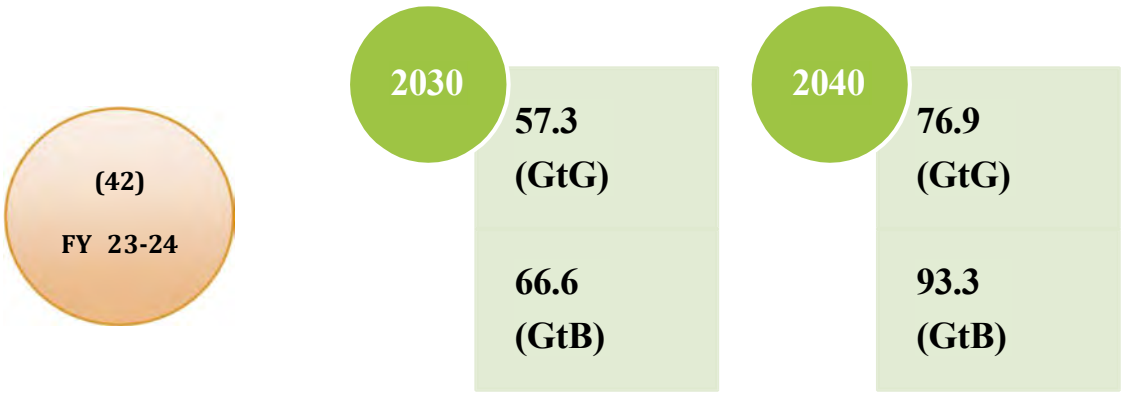
NG Demand projections for 2030 and 2040

Natural Gas consuming sectors

3.7 Other Industries:

- This bucket category includes large manufacturing industries, agriculture, and consumption in oil and gas operations etc.
- India is **one of the largest tea producers in the world**, known for its diverse tea-growing regions (Assam, Bengal, Tamil Naidu and Kerela) and high-quality varieties. The country is the second- largest tea producer globally, after China, and plays a crucial role in the global tea market. This industry is a large gas consumer in NE region.
- Indradhanush Gas Grid Limited, a joint venture of IOCL, ONGC, GAIL, OIL, and NRL, is developing the North East Gas Grid to promote the economic development of the region by leveraging its hydrocarbon potential, enhancing access to clean fuel, and accelerating regional growth which will further improve to tap natural gas consumption demand required to industries.
- Urbanisation and increased manufacturing activities and shift to cleaner fuel under heavy industrial and manufacturing sectors, would drive natural gas demand.

Projections: **in mmscmd**

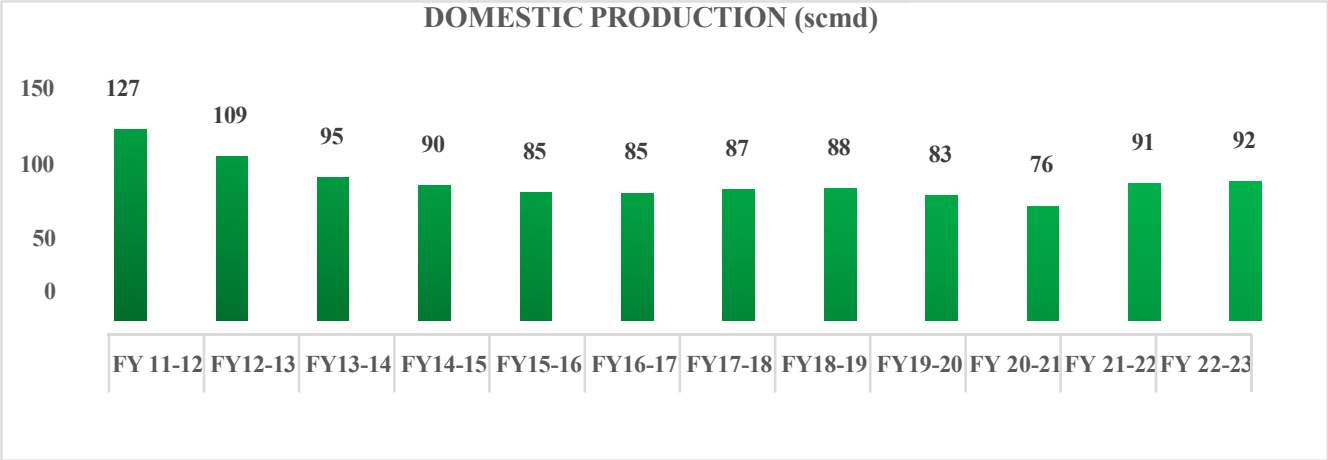


- By 2030, it is expected to grow at CAGR of 5% in GtG, and 8% in GtB scenario.
- By 2040, it is expected to grow at CAGR of 3% in GtG, and 5% in GtB scenario.
- High domestic demand (consumes ~80% of the production) and strong export market contributes ~20% of global tea production.

Chapter – 4

4.1 Domestic Gas Production:

Domestic gas production remains stagnant, meeting only ~50% of India's total demand:

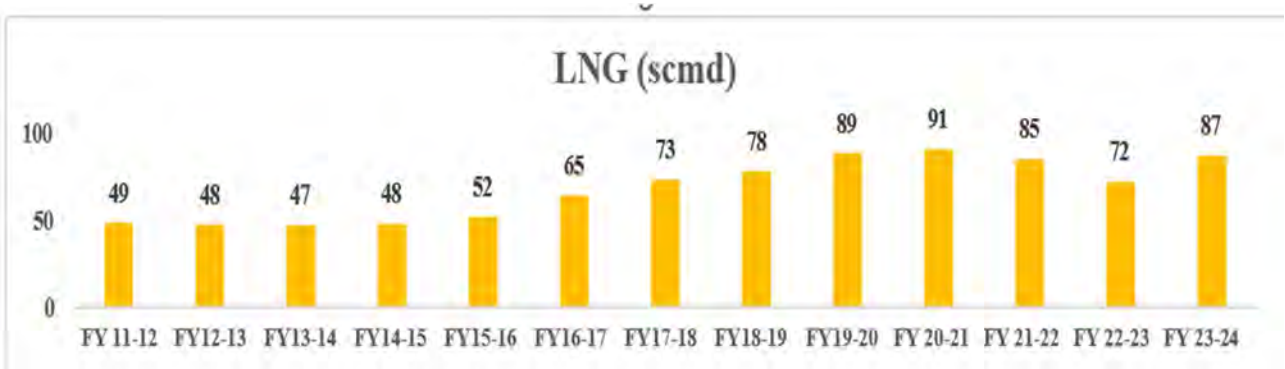


Source: PPAC

Efforts are underway to boost domestic gas production, including ONGC's technology collaboration with BP to enhance output from Mumbai High. Offshore gas production is set to grow with ONGC's KG-D5 project (2025-2030) but declines in legacy fields like Mumbai High and Bassein will offset gains. Pipeline connectivity via North East Gas Grid to gas fields in NE region is expected to boost gas production and consumption. Coal Bed Methane (CBM) production showed marginal growth but remained below 3 mmscmd in 2024.

LNG IMPORTS

India is the 4th largest LNG importer after China, Japan, and Korea**.** The upward trajectory of LNG demand is continued.



Source: PPAC

NG Demand projections for 2030 and 2040

Favorable LNG Scenario

As LNG demand is projected **to double to ~200 MMSCMD by 2030**. A favorable global ecosystem for LNG, especially with several LNG projects set to be commissioned in the USA, will create an influx of LNG from 2026 onwards. With new LNG stream coming on stream, LNG presents a strategic opportunity for Indian entities to secure long-term contracts, which can structurally provide lower pricing and mitigate price volatility and ensure a reliable supply for consumers.

To bridge the supply-demand gap, Indian companies are already securing long-term LNG deals which was quite visible in the recently held India Energy Week (IEW) 2025. Indian Oil Corporation Limited (IOCL) & ADNOC (UAE), BPCL & ADNOC: 5-year LNG supply deal, and GSPC & TotalEnergies: 10-year LNG contract.

4.2 LNG Terminal

Growth of LNG Terminals in India

India's LNG journey began in 2004 with the establishment of the first regasification terminal at Dahej. This was followed by the Hazira terminal in 2005 with a capacity of 5 MMTPA. As demand for LNG grew, additional terminals were commissioned at Dabhol and Kochi (2013) and Ennore (2019). With Chhara commissioning, presently, the country has eight operational onshore LNG terminals, offering a combined regasification capacity of ~ 190 MMSCMD (52.7 MMTPA) against a near 50% utlisation.

LNG Terminal Capacity and utilisation

The performance of LNG terminals in India varies significantly. The table below presents a summary of their current capacity and utilisation levels:

Sl. No	Year Commissioned	Operator	Terminal	Capacity (MMTPA)	Utilization 2023-24	Average Utilization (2015-16 to 2022-23)
1	2004	PLL	Dahej	17.5	95.10%	98.23%
2	2013	PLL	Kochi	5.0	20.60%	13.14%
3	2005	Hazira LNG Pvt Ltd.	Hazira	5.2	30.30%	67.17%
4	2013	KLL	Dabhol	5.0	42.7%	57.50%
5	2019	Indian Oil LNG Pvt Ltd.	Ennore	5.0	18.30%	12.00%
6	2020	GSPC LNG Ltd	Mundra	5.0	14.60%	24.93%
7	2023	Adani Total	Dhamra	5.0	27.40%	-
8	2025	HPCL	Chhara	5.0	-	-
Total	-	-	-	**52.7**	**50.50%**	**54.64%**

Source: PPAC

While the country currently has a **total regasification capacity of 52.7 MMTPA**, an **additional 5 MMTPA terminal at Jafrabad** is under construction. Several other land-based terminals and floating storage regasification units (FSRUs) are in various stages of development. Additionally, expansion plans for the Dahej and Dabhol terminals, each adding 5 MMTPA, will further increase available capacity. **Strategic thinking is needed to ponder effective utilisation of LNG infrastructure, flexibility in destination-based LNG contracts and evacuation plan**.

Proper assessment of demand is crucial to ensure LNG terminals operate efficiently. Large-scale investments in infrastructure should align with industry needs to avoid excess capacity and financial inefficiencies.

PNGRB is focused on ensuring that LNG terminals are well-integrated with demand centers to prevent non-performing assets as several terminals currently operate below their full potential due to challenges.

4.3 Domestic Gas Pricing Mechanism:

India's sectorial NG demand primarily depend **upon dual pricing system** operates under two primary mechanisms:

- the Administered Price Mechanism (APM) and
- Market-based pricing.

APM applies to older onshore fields operated by public sector companies, with prices notified by the PPAC, while gas from newer fields and imported LNG follows market dynamics. Historically, APM prices were based on a weighted average of international benchmarks, leading to high volatility. To address this, the Kirit Parikh Committee's recommendations led to a pricing revision in April 2023, linking APM gas prices to 10% of the Indian Crude Basket, with a floor of USD 4/MMBTU and a ceiling of USD 6.5/MMBTU. Natural Gas from new wells in nomination fields qualifies for a 20% premium over APM rates.

To promote exploration and production, the government grants marketing and pricing freedom to gas from High Pressure High Temperature (HPHT) fields, deepwater, ultra-deepwater blocks, and coal bed methane (CBM) projects. For these challenging fields, a biannual price ceiling is determined based on the landed price of alternative fuels, which stood at USD 10.16/MMBTU in FY 2024-25. Additionally, gas produced under Discovered Small Field (DSF), Hydrocarbon Exploration and Licensing Policy (HELP), and select NELP/pre-NELP blocks also enjoy full pricing autonomy.

NG demand is a function of downstream customers affordability. NG demand may shrink or increase, if anticipated NG price is too high or low as per the affordability of customers.

The allocation of domestic natural gas in India is managed by the MoPNG, prioritising sectors critical to economic development. The highest priority is given to domestic piped natural gas (PNG) for cooking and compressed natural gas (CNG) for transportation. Gas is also allocated for power generation, urea production, and LPG production. Due to a reduction or limited supply of low-priced domestic gas, consumers may have to rely on more expensive LNG increasingly.

4.4 Compressed Bio-Gas (CBG):

India's biogas sector has a strong foundation, driven by its agricultural economy, which contributes 18% to GDP. Recognizing the strategic importance of compressed biogas (CBG), the GoI has introduced several initiatives to unlock its estimated potential of ~60 MMT (~200 mmscmd). **This fuel has the potential to supplement domestic natural gas production and enhance uptake of gas significantly**.

Currently, around 860 CBG plants are registered, with approximately 120 operational and about 200 under construction. However, the government aims to establish 5,000 CBG plants with a total output of 15 MMT (54 mmscmd).

Key government schemes include the **Sustainable Alternative Towards Affordable Transportation (SATAT) initiative,** launched in 2018 to enhance CBG production from biomass. SATAT facilitates private sector participation and ensures long-term offtake agreements with oil and gas companies to sell CBG via cascades to Retail Outlets (ROs) or mother stations. the government also introduced the **CBG-CGD synchronisation scheme**. Under this scheme, GAIL to sign a tri- partite agreements with CBG producers and CGD entities to offtake CBG through retail outlets and pipeline injection. PNGRB guidelines compliance is necessary for pipelines in addition to IS 16087.

Under Standalone Model, CBG producers own captive power plants or sell CBG to power generation companies. Producers can sell directly to consumers and industrial customers through their own retail outlets.

Further to promote CBG production, government is also providing financial assistance to lay and connect the pipeline with CGD network.

MoPNG DPI scheme, Government has approved Rs.994.5 Cr. for the development of pipeline infrastructure which connects the CBG Plants to the CGD Network. The maximum financial Assistance (FA) per project shall be Rs.28.75 Cr.

Pipeline Length (KM)	Financial Assistance /KM (Rs. Cr) (Steel Pipeline laying)	Financial Assistance /KM (Rs. Cr) (MDPE Pipeline laying)
50	0.50 Cr./km or 50% of project cost (or whichever is less)	0.075 Cr/km or 50% of project cost (or whichever is less)
50-75	0.15 Cr./km or 50% of addl. project cost b/w (50-75) km (whichever is less)	0.075 Cr/km or 50% of addl. Project cost between (50-75) km (whichever is less)
> 75	None	None

Under this schema, CBG integration into the CGD network is supported by mandating GAIL to procure CBG at a Uniform Price. Further, the government has **mandated phased blending of CBG** with CNG and PNG, starting at 1% in FY 2025-26, 3% for fiscal year 2026-2027, 4% for fiscal year 2027- 2028, increasing to 5% from FY 2028-29 onwards.

Chapter – 5

Summary

Natural Gas has been a critical component of India's energy basket to transform country to "Gas Based Economy" which would facilitate in meeting the commitments of India at world forum. The key driver for adoption of Natural Gas (NG) is availability and affordability for industrial and commercial establishments, transport etc. as well as availability of distribution infrastructure.

The PNGRB has played a pivotal role in developing gas infrastructure in the country. With 307 Geographical Areas (GAs) authorized, covering the entire country except islands, it ensures widespread access to natural gas across domestic, commercial, industrial, and transportation segments. PNGRB continues to monitor progress and engage with state authorities for policy interventions to support the adoption of natural gas.

The demand has been considered for fertiliser, power, refineries, petrochemical, other industrial & commercial establishments, households as well as CNG and LNG as transport fuel in the energy basket through 2030 and 2040. There are reasonable time periods to plan and constrict pipelines.

In view of inter-play of several factors, it would be advisable to consider NG demand under a scenario-based approach. Therefore, PNGRB has estimated NG demand in the Good to Go scenario with current policy mechanism is 297 MMSCMD by 2030 and 495 MMSCMD by 2040. Whereas, in an favourable policy framework and investments, it is expected to reach 365 MMSCMD by 2030 and 630 MMSCMD by 2040.

The CGD sector is expected to be the primary growth driver, with consumption projected to grow **2.5 to 3.5 times by 2030 and 6 to 7 times from base of ~37** mmscmd in FY 24 by the year 2030 and 2040 respectively.

Upsurge in Refinery and Petrochemical, especially renewed focus on petrochemical integration will provide new growth leg. Consequently, the petrochemical sector is expected to contribute significantly, as the Petroleum Intensity Index is projected to improve 15% by 2030 and 25% by 2040. Other Sectors like Power, Fertiliser, Iron and Steel etc. are projected to grow moderately.

LNG as a long-haul transportation fuel could be a game changer, with the potential to play a pivotal role in replacing Diesel. LNG trucking is projected to gain momentum post 2030, with the potential to emulate China's success in reducing diesel dependency.

Currently, India's natural gas production meets only ~50% of its demand. As demand is expected to grow significantly by 2030 and 2040, dependence on LNG will increase to bridge the demand-supply gap. Such a growth would result in doubling of LNG imports by 2030. The expected increase in global LNG availability beyond 2026, may offer better prices of long term LNG prices which would facilitate the consumption of LNG in the price sensitive industrial and transport sector in the country.

Tabulation of Sectorial Projections

Sector	Sector Consumption (MMSCMD) 2024	2030		2040	
		GtG	GtB	GtG	GtB
CGD	36.9	87.1	126.1	216.4	270.8
Power	25.2	35.7	40	43.5	52.8
Refinery	22	43.4	50.9	52.4	57.8
Fertilizer	58	65.3	69.3	72.9	80.5
Steel	3.2	4.3	5.1	6.4	9.3
LNG Transport	0	3.9	6.6	26.3	65.7
Others (Tea plantation, Industries, LPG Shrinkage)	42	57.3	66.6	76.9	93.3
Total	**187**	**297**	**365**	**495**	**630**

Abbreviations and acronyms

CBM – Coal Bed Methane

CGD – City Gas Distribution

CNG – Compressed Natural Gas

CBG – Compressed Bio-Gas

FSRU – Floating Storage Regasification Unit

GtG – Good to Go

GtB – Good to Best

GoI – Government of India

I&C – Industrial & Commercial

LNG – Liquefied Natural Gas

NG – Natural Gas

NGPL – Natural Gas Pipeline

PNG – Piped Natural Gas

MWP – Minimum Work Program

MMTPA – Million Metric Tonnes per Annum

MMSCM – Million Metric Standard Cubic Meter

MOPNG- Ministry of Petroleum and Natural Gas

PNGRB-Petroleum and Natural Gas Regulatory Board

PPAC-Petroleum Planning and Analysis Cell

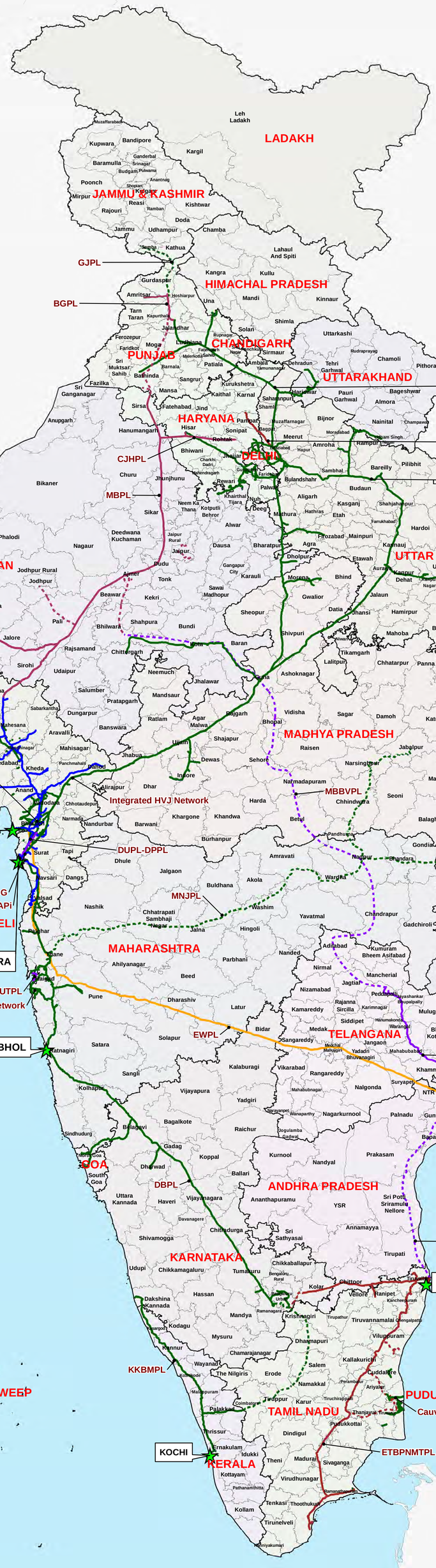
RE-Renewable Energy

SATAT – Sustainable Alternative Towards Affordable Transportation

SCM – Standard Cubic Meter

PETROLEUM AND NATURAL GAS REGULATORY BOARD

NATURAL GAS PIPELINE INFRASTRUCTURE OF INDIA - 2024



Legend

- Commissioned Natural Gas Pipeline
- Under Construction Natural Gas Pipeline
- LNG Terminal
- GAIL Pipeline
- GSPL Pipeline
- PIL Pipeline
- Other Pipeline
- IOCL Pipeline
- GIGL Pipeline
- IGGL Pipeline

* Not to the scale
* Natural Gas Pipeline Infrastructure map of India is indicative in nature

MAPPLS MapmyIndia



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