

# Will the growth of Infrastructure push demand in the Eastern Region?

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‘Carrier before Commodity’ has been a common refrain from industry with regard to natural gas development in the country. With its vision of creating a gas-based economy and increasing the share of gas in the energy mix from the current 6.2% to 15% by 2030, India has set the ball rolling towards the creation of a robust infrastructure for the downstream gas sector. The current infrastructure can carry 388 MMSCMD of gas but has limited spread over a few states only. More importantly it has the available capacity to service a much larger market size. However in order to achieve 15% of the energy mix, natural gas consumption must increase significantly to over 600 MMSCMD by the year 2030.

And therein lies the dichotomy. While Infrastructure does generally lead to growth, it is also equally true that the quantum of growth per unit of infrastructure will be different in different sectors. And the biggest question is how much of infrastructure and where!

The existing gas transmission pipeline extends over 16900 Km with a carrying capacity of 388 MMSCMD, but is limited to a few states only. , However,

**Without doubt, one of the major contributions to the growth of the gas sector in India, has been the role of GAIL. Besides accounting for almost 80 per cent of India’s gas pipeline network, GAIL, either by itself, subsidiary, or in joint ventures with other players also holds a dominant position in the city gas distribution network, in which it accounts for 60% of sales. It also supplies 60% of piped gas connections in India and operates more than 65% of the country’s CNG stations through alliances with other players, according to its 2018-2019 annual report.**

with the development of the Pradhan Mantri Urja Ganga Pipeline (PMUGP) project of 3376 Km, this pipeline would bring the states of Bihar, Jharkhand, Odisha and West Bengal on the gas map of India, besides connecting to Assam. (GAIL accounts for 80% of country’s 16981 Km pipeline network, and over 70% of the capacity along it) and In addition to the PMUG project, additional gas pipeline is being developed in the North Eastern region to connect the states of Assam, Meghalaya, Arunachal Pradesh, Mizoram, Nagaland and Tripura.

## The expanding infrastructure

The development of LNG import facilities was initiated by GAIL, in partnership with ONGC, IOCL and BPCL and the the two LNG import facilities at Dahej and later at Kochy were developed by Petronet LNG where all the above entities have equal equity. Shell and Enron developed the Hazira and Dabhol facility respectively on the west coast After the departure of Enron, GAIL took control of the Dabhol facility, a fair weather port. Recently Adani, Indian Oil and H-Enregey have also established LNG import, storage and regasification facilities on the east and west coast.

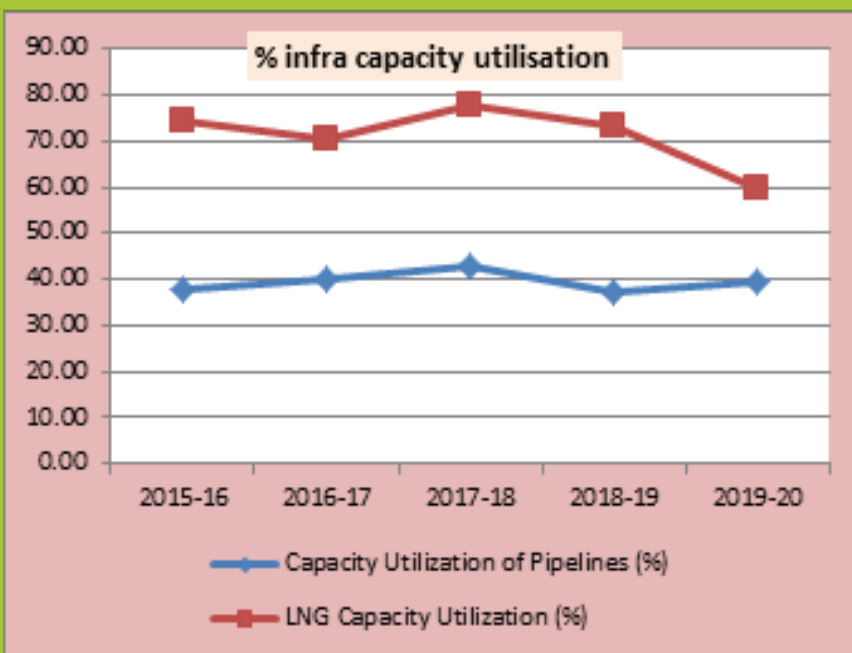
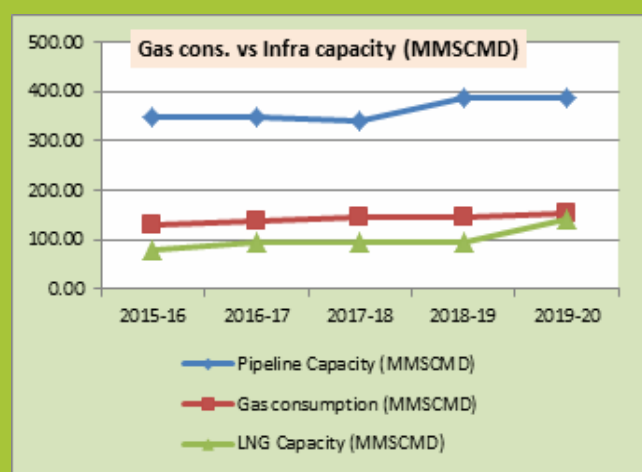
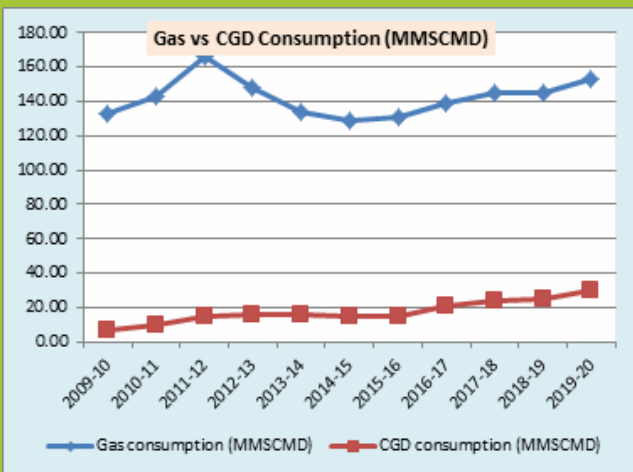
Within the next few years pipeline length is expected to touch 31500 Km. and LNG import capacity to around 53 MMT. The domestic production has been projected to grow to around 171 MMSCMD by 2024-25. Depending upon the demand which, according to an NGS 2018-19 study, has been projected to grow to 305 MMSCMD by 2030, it is estimated that there would be an increased utilization of LNG import capacities to augment the domestic availability.

## The consumption- infra disconnect

Historically pipeline and LNG import capacity have grown in leaps and bounds but the consequent growth of demand has not been in proportion. The table reflects the gas growth story. And, therefore the question whether infrastructure by itself is a necessary and sufficient condition for consumption growth.

The following tables reflect the consumption, infra growth and utilisation:

Year	Gas consumption (MMSCMD)	CGD consumption (MMSCMD)	Gas pipelines (km)	Pipeline Capacity (MMSCMD)	Capacity Utilization of Pipelines (%)	LNG Capacity (MMTPA)	Annual Imports (MMTPA)	LNG Capacity Utilization (%)
2009-10	132.45	7.03	10246			13.00		
2010-11	142.52	9.39	10772			13.00		
2011-12	165.80	15.34	11090			13.00	13.60	104.6
2012-13	147.70	15.83	14503			13.00	13.30	102.3
2013-14	134.23	16.17	15532			13.00	13.40	103.1
2014-15	128.64	14.84	15632			19.85	14.00	70.5
2015-16	130.74	14.97	16072	347.80	37.59	21.692	16.10	74.2
2016-17	139.12	21.19	16145	347.80	40.00	26.692	18.80	70.4
2017-18	144.75	24.00	16789	339.50	42.64	26.692	20.70	77.6
2018-19	145.00	25.30	16981	388.00	37.37	29.692	21.70	73.1
2019-20	153.20	29.96	16981	388.00	39.48	39.192	23.50	60.0
Estimated for 2018-19								
Av. of Oct 2019								



Tables/charts above show the growth of infra and the growth in consumption as also that India's gas consumption is increasingly being met by LNG imports, and these imports play an important role in the country's gas-based economic vision. India has signed several long-terms contracts and has five LNG terminals in operation with a combined capacity of 39.7 MMTPA. Additional facilities and expansions are being planned at various locations for import of LNG.

The data does not reflect any strong co-relation between infrastructure and growth. Despite the growth in infrastructure, consumption has not shown proportional growth. However, we anticipate demand to grow significantly once the PMUGP project is completed and the fertilizer plants come online with additional demand from refineries, petrochemicals, steel plants and new CGDs in the eastern region.

CGD consumption has grown, albeit slowly, but it has not kept pace with the overall growth. Both pipeline and LNG import capacity utilization has been abysmally low. India continues to grapple with supply constraints and affordability issues coupled with inadequate infrastructure.

According to NGS in-house study, the country's annual gas consumption is projected to double to around 110 BCM by 2030 from the current level of 58 BCM. However, the regional imbalance in the gas market – which affects West Bengal, Jharkhand, Orissa and Uttar Pradesh in the east of the country was required to be addressed before the gas market expanded beyond Jagdishpur/Phulpur in Uttar Pradesh. The development of the gas transmission grid in the eastern region is expected to address some of the issues relating to availability of gas. In order to address the imbalance in the eastern region, GAIL undertook the PMUGP project and the government decided to provide a capital grant of INR 51.76 billion (which is 40% of the estimated capital cost of INR129.4 billion) to GAIL for development of the 2,655 Km long Jagdishpur-Haldia/Bokaro-Dhamra gas pipeline and also extension of the pipeline from Baruani to Guwahati. Further, as a way of strengthening India's northeastern gas grid, the government is funding 60% of the INR 90 billion cost of a additional 1,656 Km pipeline connecting Guwahati in Assam with major cities

such as Itanagar, Dimapur, Kohima, Imphal, Aizwal, Agartala, Shillong, Silchar, Gangtok, and Numaligarh. The expansion of the gas grid in these two regions, it is hoped, would correct the regional imbalance in gas supplies as noted by the PNGRB in its “Vision 2030” – Natural Gas Infrastructure in India plan, published in 2013. The development of pipeline infrastructure and the import facility for 5 MMTPA LNG at Dhamra, Odisha is expected to give a significant boost to the gas market in the eastern region.

### Other major pipelines

Gas pipelines under construction are expected to take gas to the eastern and northeastern regions as well as to consumers in the entire southern region. India currently consumes about 155 MMSCMD, however in order to reach 15% share in the energy mix by 2030, gas consumption must increase to 600 MMSCMD. This is a stupendous task and various entities including GAIL, Indian Oil, Bharat Petroleum and GSPL are laying the infrastructure to help achieve that target. Besides the PM Urja Ganga Project and Indradhanush Pipeline projects several other pipelines are in the construction/development stage, according to PNGRB.

1. **GAIL:** Srikakulam to Angul Pipeline of 390 Km
2. **H-Energy:** Kawai Chata to Shrirampur of 242 Km plus spurline of 73 Km
3. **IMC Ltd:** Kakinada to Vijaywada to Nellore P/L of 522 Km plus spurline of 145 Km
4. **H-Energy:** Jaigarh to Mangalore P/L of 435 Km
5. **Indian Oil:** Ennore to Tuticorin of 1385 Km
6. **GSPL:** Mallavaram-Bhopal-Bhilwara-Vijaipur of 2042 Km
7. **GSPL:** Mehsana-Bhatinda of 2052 Km
8. **GSPL:** Bhatinda-Jammu-Srinagar of 725 Km

### LNG Import Capacity:

This financial year witnessed the expansion of Petronet's facility from 15 MMTPA to 17.5 MMTPA and two new import facilities of 5 MMTPA capacity each being commissioned at Ennore on the east coast and Mundhra on the west coast. H-Energy also announced the Floating Storage and Regas Unit offshore Jaigarh. There are few more under construction at Dhamra, Dighi in West Bengal and Karaikal by AG&P and ADNOC Logistics on the east coast.. The contract for construction of break-water at Dabhol has been awarded to L&T and this should get completed in two-and-half-years. On completion it will help operate the Dabhol terminal at its full capacity of 5 million tonnes per annum,

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## Will the Eastern Region Demand reward the infrastructure effort

Regional gas markets and pipeline infrastructure in India feeding the markets have been mostly limited to the west and part of north India. The PUMGP project, the Eastern Grid and additional pipelines are being developed in the southern region are expected to change the scenario dramatically and give a significant boost to the consumption. Once the transmission pipelines in the south of India are in place, it is expected to significantly enhance the capacity utilization of LNG import facilities at Kochy and Ennore.

Gas transmission pipelines being developed in the eastern states and the additional gas pipelines are expected to benefit the city gas distribution projects. On the back of the PM Ganga Urja Project, six cities were awarded to GAIL Gas by the Ministry of Petroleum & Natural Gas to develop gas distribution networks in six cities - Varanasi, Patna, Ranchi, Khordha, Jamshedpur and Cuttack. The PMUGP project will also provide the support for the revival of three fertilizer plants in Barauni, Gorakhpur and Sindri and also augmenting supply to Matix Fertilizer, Durgapur, besides providing natural gas as a clean fuel option to liquid petroleum currently being consumed in refineries at Barauni, Haldia, Paradeep, Guwahati, Bogaingaon, Numaligarh, Digboi and steel plants in Jamshedpur, Bokaro, Rourkela, Burdawan, Durgapur including other industries.

In the medium to long term, the completion of the pipeline projects undertaken in the eastern part of the country and in Andhra, Telengana and Odisha besides the LNG import facility will provide the necessary comfort to the gas market to grow on a sustained basis. The new infrastructure will not only bring gas to the markets in the region but is also expected to trigger demand where none existed earlier. Once the Jagdispur Haldia section, connecting Matix fertilizer plant will be commissioned, additional gas will flow into the fertilizer plant. On completion of the Bokaro-Dhamra and Barauni-Guwahati sections, refineries and petrochemical plants along the way could give further boost to the demand. The work on Northeast network under Indradhanush Gas Grid, a JV between GAIL, IOCL, ONGC and NRL, is expected to start soon post-recent government approval of 60% viability gap funding. Further, medium-term contracts to supply RLNG are believed to have been tied up on the back of the PM Ganga Urja Pipeline with the four fertilizer plants, where LNG price is a pass-through under urea subsidy scheme – Matix fertilizer plant will get connected in a

Region	Approx. % Participation	States with Pipeline Infra Consuming gas	States lacking Pipeline infra
Western	51%	Gujarat, Maharashtra, Goa	
Northern	26%	Delhi, West UP, Haryana, Rajasthan	Punjab, J&K, HP, Uttrakhand
Central	4%	MP	Chattisgarh
Southern	15%	AP, Tamil Nadu	Kerala, Karnataka
Eastern	0%		Bihar, West Bengal, East UP, Jharkhand, Odisha
North Eastern	4%	Assam, Tripura	Meghalaya, AP, Mizoram, Manipur, Nagaland

month and can off-take up to 1.60 MMSCMD of gas volumes and three urea plants in Barauni, Gorakhpur and Sindri are expected to be commissioned over the next 15-18 months along the east India gas grid and will off-take about 4.80 MMSCMD of gas volumes under term contracts.

Consequent to the completion of the LNG import facility at Dhamra and the transmission pipelines, the gas consumption in the region is estimated to grow significantly. The conservative demand increase would be in the range of 17-18 MMSCMD. Details are placed at Annexure-1.

<b>1. Fertilizer plants</b>	6.40 MMSCMD
<b>2. Refineries</b>	2.85 MMSCMD
<b>3. Petrochemicals</b>	2.75 MMSCMD
<b>4. Steel Plants</b>	2.00 MMSCMD
<b>5. City Gas Distribution Projects</b>	3.00 MMSCMD
<b>6. Other Industrial</b>	1.00 MMSCMD
<b>TOTAL</b>	<b>18.00 MMSCMD</b>

Considering the above as the anchor load, it is expected that the infrastructure will provide the necessary impetus for the market to grow in the future. Perhaps, we can safely say that in this case infrastructure by itself has the potential to play a key role for growth in consumption provided the assumed underlying market to support it develops to its full potential. While it may be correct to say that without infrastructure the demand would not fructify, it is equally important to have some kind of anchor market for infrastructure development and not hoping that demand will come up once the infrastructure is in place.

This is what gives hope in this case. We have examples of the first gas transmission HBJ Pipeline project in the country which came up with the support of six new fertilizer plants and three new power plants. And once the pipeline was commissioned additional markets were tapped including new projects as the new projects were mostly delayed. In the case of the Eastern grid also, there has been an initial integration of

market, albeit not very large, with the development of the infrastructure and therefore the likelihood of positive growth.

There may not be any proportional relationship between infrastructure and demand, but then without infrastructure the market would be completely shut out, whereas with infrastructure an opportunity is provided for the market to grow. However, it would indeed be too much to expect infrastructure by itself to lead to demand growth of matching proportions. Robust policies and regulations are of immense importance, both at the Central and the Regulatory levels as also at the State Government level in not only ensuring utilization of the infrastructure but also in expanding the markets. For example, the issue of affordability will remain

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to be critical and markets will continue to be driven by the price factor and that may need to be the next pit stop.

**ANNEXURE-1:**

Estimated Demand Generation from Fertilizer, Refinery, Petrochemicals, Steel and CGD sectors:

Plants	Location	Additional Estimated Demand MMSCMD	Pipeline Project
Fertilizer Corporation of India	Sindri, Jharkhand	1.60	PMUGP
Fertilizer Corporation of India	Gorakhpur, UP	1.60	PMUGP
Hindustan Fertilizer	Barauni, Bihar	1.60	PMUGP
Hindustan Fertilizer	Haldia, W Bengal	?	PMUGP
Brahmaputra Valley Fertilizer	Namrup, Assam	Gas based	Existing P/L
Matix Fertilizer	Durgapur, W Bengal	1.60	PMUGP
<b>FERTILIZER TOTAL</b>		<b>6.40</b>	
India Oil Corporation	Barauni, Bihar	0.50	PMUGP
India Oil Corporation	Guwahati, Assam	0.10	PMUGP
India Oil Corporation	Haldia, W Bengal	0.60	PMUGP
India Oil Corporation	Bongaigaon, Assam	0.20	PMUGP
Indian Oil Corporation	Digboi, Assam		Existing P/L
Indian Oil Corporation	Paradeep, Odisha	1.20	PMUGP
BPCL Refinery Project	Numaligarh, Assam	0.25	Indradhanush
<b>REFINERY TOTAL</b>		<b>2.85</b>	
HPL	Haldia, W Bengal	1.50	
IOC	Paradeep, Odisha	1.00	
Brahmaputra Cracker & Polymer	Dibrugarh, Assam	0.25	
<b>PETROCHEMICALS TOTAL</b>		<b>2.75</b>	
Hindustan Steel Plant	Rourkela, Odisha		PMUGP
Hindustan Steel Plant	Bhilai, C'garh		
Hindustan Steel Plant	Durgapur, W Bengal		PMUGP
Hindustan Steel Plant	Bokaro, Jharkhand		PMUGP
Hindustan Steel Plant	Burnpur, W Bengal		PMUGP
Tata Steel	Jamshedpur, J' Khand		PMUGP
Jindal Steel	Angul, Odisha		PMUGP Spurline
Jindal Pellet	Barbil, Odisha		PMUGP
Jindal Steel	Raigarh, C'garh		
Jindal Steel	Patratu, Jharkhand	?	
<b>STEEL TOTAL</b>			
CGDs (37 Recently Authorized GAs in East UP, Bihar, Jharkhand, Odisha, Assam) plus Kolkata		4.00	PMUGP
<b>CITY GAS TOTAL</b>		<b>3.00</b>	