

Natural Gas: April-November 2020 update

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Domestic Natural Gas production, imports and consumption during April-November 2020 i.e. 8M-FY21

Table 1: Domestic Production, Consumption and Imports of Natural Gas (Unit: MMSCM)

	2019-20	2020-21	Change (y-o-y)	
			2019-20	2020-21
Production	21,210	18,704	-2.6%	-11.8%
Imports	21,832	21,971	10.4%	0.6%
Consumption	42,435	40,074	3.4%	-5.6%

Source: PPAC

Domestic production from onshore fields was around 34% while CBM fields contributed around 2% of the total natural gas production during H1-FY21. Major part of the output however was from the offshore gas fields which constituted around 64% of the total domestic natural gas production. NOCs* have contributed around 87% of the total domestic output whereas PSC* fields have contributed the remaining around 13%.

* NOCs: National Oil Company PSC: Production Sharing Contract

Domestic natural gas production has declined sharply by 11.8% during 8M-FY21 compared with the 2.6% fall registered during 8M-FY20. Cumulative fall in production is mainly due to restricted gas off take by consumers due to the on-going COVID-19 situation. Cumulative production was also down due to bandh/blockade by local people /union /association after the blow out at the Baghjan well (contributes to 8% of the overall production), which has now been fully doused after 5 months of its occurrence.

Consumption of natural gas fell by 5.6% on a y-o-y basis during 8M-FY21. Natural gas is used as a fuel (energy) and as a feedstock (non-energy) by the respective end user industries. Natural Gas is used as a feedstock in several industries like fertilizers (32%), plastics and other commercially important organic chemicals and also used as a fuel for electricity generation (20%), heating purpose in industrial and commercial units. Natural gas is also used for cooking in domestic households and as a transportation fuel for vehicles (CGD network- 11%). There has been a growth in consumption as the economic activities regain slow and steady growth and given the government's thrust towards propagating the use of natural gas, consumption at the moment has recovered up to 94.6% of its pre-COVID levels.

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Imports of natural gas in the form of LNG have increased by 0.6% reversing the negative trend experienced since the start of the year. Import dependency based on consumption has increased to 54.8% during 8M-FY21 as compared with it being 51.4% during 8M-FY20. India has imported LNG from Qatar, Nigeria, UAE and Nigeria.

Table 2: Monthly trend in Natural Gas Demand-Supply and Trade (Unit: MMSCM)

	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20
Production	2,161	2,300	2,324	2,443	2,432	2,294	2,419	2,331
y-o-y	-18.6%	-16.0%	-11.8%	-10.1%	-9.5%	-10.7%	-8.4%	-9.1%
LNG import	1,947	2,383	2,673	2,963	2,976	2,972	3,280	2,893
y-o-y	-29.4%	0.5%	-6.9%	6.0%	5.4%	6.2%	16.1%	11.7%
Consumption	4,013	4,598	4,923	5,333	5,339	5,199	5,628	5,156
y-o-y	-24.8%	-8.6%	-9.3%	-1.8%	-1.7%	-1.7%	4.3%	1.4%

Source: PPAC

Natural gas production in the country fell 9% in November largely due to a fall in eastern offshore field output. Even the Hazira processing plant was shut down for maintenance. Demand for natural gas is also improving and returning to normalcy as the country is slowly reflating. During November'20 the consumption of natural gas has been positive for two consecutive months and has increased by 1.4% on a y-o-y basis. The government wants to transform India into a gas-based economy and increase its share of consumption to 15% from the entire energy basket from the current 6% by 2030.

Review of the Natural Gas Infrastructure

Natural gas infrastructure mainly consists of (1) R-LNG terminals, (2) Gas Pipelines and (3) City Gas Distribution (CGD) networks.

R-LNG

R-LNG is a process of converting liquefied natural gas (LNG) back to natural gas. The process includes liquefaction of natural gas and its transportation in liquefied form through specialized carriers to the destination, that is, the, RLNG terminal where it is converted back into gaseous state. The gas is converted to liquid form for ease of storage or transport. It takes up about 1/600th the volume of natural gas in the gaseous state. This makes LNG cost efficient to transport over long distances where pipelines do not exist. Overall capacity utilisation of R-LNG terminals is around 58%.

Table 3: Existing R-LNG Terminals and Capacity Utilisation (Unit: MMTPA)

LNG Terminal	Entity/Promoters	Capacity	Capacity Utilisation **
Dahej	Petronet LNG Limited	17.5	95.0
Hazira	Shell Energy Pvt Limited	5	96.9
Dabhol Ratnagiri*	Konkan LNG Private Limited	5	40.9
Kochi	Petronet LNG Limited	5	15.8
Ennore	Indian Oil Corporation Limited	5	11.3
Mundra	GSPC LNG Limited	5	36.2
Total Existing Capacity (as on 01.12.2020)		42.5	

Source: PPAC

* To increase to 5 MMTPA with breakwater only HP stream of capacity of 2.9 MMTPA is commissioned.

**April-October (%)

Natural Gas pipelines

Gas pipelines are the most cost effective and safest mode of transportation of natural gas to its end users (power generators and urea manufacturers).

The natural gas is primarily sourced from KG-D6, Mumbai offshore, Cambay Basin, Ravva Offshore, KG Basin, Cauvery basin and through imports of LNG.

Table 4: Major natural gas pipeline network as on 30.06.2020

	GAIL	GSPL	PIL	IOCL	AGCL	RGPL	GGL	DFPCL	ONGC	GIGL	GITL	Others*	Total
Operational													
Length	8,241	2,265	1,460	132	105	312	73	42	24	-	-	-	12,654
Capacity	171.6	43	85	20	2.4	3.5	5.1	0.7	6	-	-	-	337.3
Partially Commissioned#													
Length	3,533	-	-	23	-	-	-	-	-	442	364	-	4,362
Total Operating													
Length	11,774	2,265	1,460	155	105	312	73	42	24	442	364	-	17,016
Under Construction													
Length	6,352	-	-	1,398	-	-	-	-	-	2,335	1,678	3,780	15,543
Overall Total													
Length	18,126	2,265	1,460	1,553	105	312	73	42	24	2,777	2,042	3,780	32,559

Source: PPAC, PNRGB

#operating length, *Others-APGDC, HEPL, IGGL, IMC, Consortium of H-Energy

Gas pipeline grid determines the structure of the gas market and its development. Therefore, an interconnected National Gas Grid has been envisaged to ensure the adequate availability and equitable distribution of natural gas in all parts of the country.

At present, there are about 17,016 km of Natural Gas pipelines which is operational in the country. In order to make available natural gas across the country, additional pipelines are under construction to complete the National Gas Grid. This would ensure easy availability of natural gas across all regions and also potentially help to achieve uniform economic and social progress.

PNRGB has notified a draft amendment to implement unified tariffs for natural gas grid. The regulator has proposed to calculate unified tariffs on a fortnightly basis by taking sum product of actual/contractual volumes- it will be then split on a volume weighted basis across two zones and charged to the end user consumer across the country any surplus or deficit will be settled between them.

City Gas Distribution

City Gas Distribution (CGD) is an important integral part of any city. CGDs are networks and pipelines for carrying natural gas and petroleum. Setting of CGD network is authorised by the Petroleum and Natural Gas Regulatory Board (PNRB) under the Petroleum and Natural Gas Regulatory Board (PNRB) Act. The PNRB oversees the CGD bidding rounds where the successful entities are authorised to lay down the CGD infrastructure in a specified Geographical Area (GA) of the country and operate it.

CGD entities supply fuel in the form of Compressed Natural Gas (CNG) and Piped Natural Gas (PNG) to various consumers for industrial, domestic, commercial and transportation purposes. Gas supplied to industrial, domestic and commercial customers is known as PNG, whereas gas in the form of CNG is dispensed through CNG refuelling stations to CNG fuelled vehicles (transportation).

To promote the development of CGD network, the Government has accorded the priority in domestic gas allocation to PNG (Domestic) and CNG (Transport) segments. It has been decided to meet 100% gas requirement of CNG and PNG segments through supply of domestic gas which is cheaper than imported gas.

- **CNG**

Table 5: CNG Stations as on 31st October 2020

State	As on 1.04.2020	As on 31.10.2020	Increase in absolute terms
Gujarat	636	699	63
Delhi	419	419	0
Maharashtra	375	402	27
Andhra Pradesh & Telangana	132	144	12
Rajasthan	16	34	18
Uttar Pradesh	307	363	56
Tripura	14	11	-3
Madhya Pradesh	62	71	9
Haryana	103	133	30
West Bengal	10	11	1
Karnataka	23	35	12
Chandigarh*	11	15	4
Daman & Diu and Dadra and Nagar Haveli	15	19	4
Kerala	8	9	1
Odisha	19	19	0
Punjab	33	67	34
Uttarakand	5	10	5
Assam	1	1	0
Bihar	8	9	1
Goa	2	2	0
Jharkhand	8	13	5
All India	2207	2486	279
Change(+/-)			12.6%

Source: PPAC, CARE Ratings

As per table no 5, amid the country facing the COVID-19 pandemic, all over India there has been an increase of additional 279 CNG refuelling stations across all states during FY21 (April-October) compared with the CNG stations present during the start of the fiscal with Gujarat leading with 63 new stations and Uttar Pradesh trailing close behind with 56 stations. Nearly 77% of India's CNG stations are concentrated in Delhi, Gujarat (including Dadra & Nagar Haveli and Daman and Diu), UP and Maharashtra. Some of the CNG stations seemed to have rendered shut due to the fall in demand of CNG refuelling due to the pandemic.

CNG is 60% cheaper than petrol and 45% cheaper than diesel and given the volatility in petrol-diesel prices more vehicle users are making a shift to CNG powered vehicles and is fast gaining prominence as a preferred fuel especially in the case of public transportation.

- **PNG**

PNG is supplied to residential, commercial and industrial users through extensive network of pipelines. Gas sales to commercial and industrial users are achieved through long-term gas sales agreement, whereas residential users are charged on usage basis. PNG is safer than LPG and since it is lighter than air, it dissipates immediately in the air in case of leak. The flow of PNG can be easily controlled by various safety checks/valves installed in the system. As PNG is supplied through a pipe, it offers uninterrupted supply round-the-clock and is space economical as it does not occupy space which in the kitchen which was initially reserves for storing cylinders.

Domestic connections pertain to residential households. They use gas primarily for domestic cooking or heating purpose. The piped gas is increasingly being seen as an attractive alternative to the domestic LPG cylinders as is cheaper by 40% as compared to the market price of LPG and the price of PNG almost matches with that of subsidised LPG (based on prices in Delhi).

Commercial connections are supplied to customers who are proprietors or partnership entities that utilize PNG exclusively for commercial purposes. These set of customers comprises of hotels, restaurants, dairies, educational institutes etc.

Industrial connections are large-volume customers from the industrial sector. This set of customers comprises of textile pharmaceuticals, glass, chemicals, pulp and paper etc. They constitute a major portion of the total gas sales. They utilize gas for a variety of purposes such as heating, cooling, power production and as a process feedstock. Supplying PNG to industrial users can further be categorized into large-scale industries and small/medium-scale industries.

Table 6: Number of Piped Natural Gas connection as on 31st October 2020

	Domestic	Commercial	Industrial
Andhra Pradesh	1,45,736	221	18
Assam	35,469	1,153	404
Bihar	17,862	8	0
Chandigarh	1,11,232	34	6
Dadra and Nagar Haveli	5,650	50	40
Delhi	9,66,098	2460	1,456
Goa	4,013	0	2
Gujarat	22,98,579	20,783	4,811
Haryana	1,63,368	381	747
Himachal Pradesh	10	0	0
Jharkhand	19,030	0	0
Karnataka	2,01,981	326	170
Kerala	41,940	10	9
Madhya Pradesh	91,068	171	267
Maharashtra	18,14,642	4,367	335
Odisha	12,376	0	0
Punjab	8,390	40	30
Rajasthan	16,975	17	55

Telangana	92,345	17	39
Tripura	46,881	442	60
UT part of Daman & Diu	3,585	25	24
Uttar Pradesh	8,27,749	1,459	2,066
Uttarakhand	28,768	26	30
Total	69,53,747	31,990	10,570

Source: PPAC

As on 31.10.2020 (69.96 lakh connections) the total number of PNG connections has increased by 14.5% during FY21 (April-October) compared with the PNG connections on 1.04.2020 (there were 61.09 lakh connections in the start of the fiscal year). Domestic connections, commercial connections and industrial connections have increased sharply by 14.6%, 4.5% and 3% respectively. Out of the total PNG connections domestic connections constitute 99.4% share followed by commercial connections having a 0.5% share and industrial connections having a 0.2% share.

CGD entities had resumed worked in green and orange zones once government announced relaxations came into effect 15th April 2020 onwards. The government is planning to come up with the 11th CGD bidding round very soon.

Domestic Gas Price

The government has revised the domestic natural gas price as per the New Domestic Gas policy, 2014. The revised price will be prevalent from October 1st 2020 till 31st March 2021 i.e. H2-FY21. The gas price for locally produced fields has been revised to USD 1.79/mmBtu from USD 2.39/mmBtu resulting in a 25.1% decrease and the ceiling price for gas to be produced from difficult fields has also fallen to 4.06 USD /mmBtu from USD 5.61/mmBtu resulting in a 27.6% decrease.

Prices of domestic natural gas have fallen third time in a row now and prices which will be prevalent H2-FY21 onwards will be the lowest gas price ever recorded under the New Domestic gas policy. The domestic natural gas price is determined by the formula which considers the volumes and price of natural gas in USA (Henry Hub), UK (New Balancing Point), Canada (Alberta Gas) and Russia (Russian Natural Gas). Prices of gas in these hubs are market linked.

Table 7: Domestic Natural Gas Prices (Unit: USD/mmBtu) on a Gross Calorific Basis (GCV) Basis

	Domestic Natural Gas Price	Change (+/-)
1 st Nov'14 – 31 st Mar'15	5.05	-
1 st Apr'15 – 30 th Sep'15	4.66	-7.7%
1 st Oct'15 – 31 st Mar'16	3.82	-18.0%
1 st Apr'16 – 30 th Sep'16	3.06	-19.9%
1 st Oct'16 – 31 st Mar'17	2.50	-18.3%
1 st Apr'17 – 30 th Sep'17	2.48	-0.8%
1 st Oct'17 – 31 st Mar'18	2.89	16.5%
1 st Apr'18 – 30 th Sep'18	3.06	5.9%
1 st Oct'18 – 31 st Mar'19	3.36	9.8%
1 st Apr'19 – 30 th Sep'19	3.69	9.8%
1 st Oct'19 – 31 st Mar'20	3.23	-12.5%
1 st Apr'20 – 30 th Sep'20	2.39	-26.0%
1 st Oct'20 – 31 st Mar'21	1.79	-25.1%

Source: PPAC

The Government also implemented the decision to allow marketing and pricing freedom for gas produced from High Pressure High Temperature, Deepwater and Ultra Deepwater areas, with a ceiling price arrived at on the basis of landed price of alternative fuels with a view to incentivize monetization of domestic gas resources in difficult areas. This means the producers have a maximum amount/ ceiling price which they can charge for the gas produced from difficult fields.

Table 8: Domestic Gas price for gas produced from difficult fields (Unit: USD/mmBtu) on a Gross Calorific Value (GCV) basis

	Ceiling Prices for Gas from HP-HT/Deep/Ultradeepwater	Change (+/-)
1 st Apr'16 – 30 th Sep'16	6.61	-
1 st Oct'16 – 31 st Mar'17	5.30	-19.8%
1 st Apr'17 – 30 th Sep'17	5.56	4.9%
1 st Oct'17 – 31 st Mar'18	6.30	13.3%
1 st Apr'18 – 30 th Sep'18	6.78	7.6%
1 st Oct'18 – 31 st Mar'19	7.67	13.1%
1 st Apr'19 – 30 th Sep'19	9.32	21.5%
1 st Oct'18 – 31 st Mar'20	8.43	-9.5%
1 st Apr'20 – 30 th Sep'20	5.61	-33.5%
1 st Oct'20 – 31 st Mar'21	4.06	-27.6%

Source: PPAC

Prices of R-LNG are usually contract based and are linked with the global crude oil prices. However, soon natural gas end users could be taking delivery on India's first gas exchange which has just been launched month ago. Prices of LNG will then be based on market demand-supply.

Apprehensions regarding current domestic gas price

With the current domestic gas price falling far below the breakeven price, exploration of gas is no longer lucrative for upstream gas companies. As mentioned earlier, the domestic gas price formula is dependent on rates from mature markets and a collapse in the global gas market due to the COVID-19 pandemic has sharply brought down the domestic price as well. Upstream players could potentially be incurring losses with the current gas price. It is speculated that the new formula could have a floor price which could be linked to some international benchmark.

Outlook for FY21

The gross production of domestic natural gas is to fall by 10.6% during FY21. Production has fallen by 5.9% during FY20 and by 11.8% during 8M-FY21.

- E&P prospects in FY21 do not look promising as no company would aggressively want to increase production or get into high risk projects with such a low gas price.
- Currently (H2-FY21) the price for gas produced from local fields has been revised to USD 1.79/mmBtu which is the lowest price ever set as the New Domestic Gas Policy and is even below the breakeven point for most fields. Unlike crude oil prices which are dependent on market forces of demand and supply, domestic natural gas prices will remain fixed till 31st March 2021.

Given the improvement in the overall macros of the economy, consumption of natural gas is to fall by 2.7% instead of the earlier stated 3.2% by the end of FY21. Domestic natural gas consumption had grown by FY19, 5.2% during FY20 and fallen by 5.6% during 8M-FY21.

- Demand only to be supported by the increase in production of urea. Sales of urea have been increasing on account of a 2 consequent good monsoon season.
- Use of natural gas in the form of PNG and CNG will remain stable but it will not increase incrementally due to the timely completion of pipeline and city gas distribution projects as per the timelines mentioned in the subsequent CGD bidding rounds.

Imports of natural gas in the form of LNG are to increase by 5% due to the fall in domestic demand for natural gas. LNG imports have increased by 0.6% during 8M-FY21.

- LNG imports will only grow to the extent of plugging in the structural gap between gas demand and domestic production.

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