

## Natural Gas- April-December 2020 update

January 25, 2021 | Industry Research

### Domestic Natural Gas production, imports and consumption during April-November 2020 i.e. 9M-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
<b>Production</b>	25,120	21,129	1.9%	-15.9%
<b>Imports</b>	24,587	24,753	11.4%	0.7%
<b>Consumption</b>	47,730	45,211	3.5%	-5.3%

Source: PPAC

Domestic production from onshore fields was around 30% while CBM fields contributed around 3% of the total natural gas production during 9M-FY21. Major part of the output however was from the offshore gas fields which constituted around 67% 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 15.9% during 9M-FY21 compared with the 1.9% increase registered during 9M-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 5.3% on a y-o-y basis during 9M-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 upto 94.8% of its pre-COVID levels.

**Imports of natural gas in the form of LNG** have increased by 0.7% reversing the negative trend experienced since the start of the year. Import dependency based on consumption has increased to 54.8% during 9M-FY21 compared with it being 51.5% during 9M-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	Dec-20
<b>Production</b>	2,161	2,300	2,324	2,443	2,432	2,294	2,419	2,331	2,425
<b>y-o-y</b>	-18.6%	-16.0%	-11.8%	-10.1%	-9.5%	-10.7%	-8.4%	-9.1%	-7.1%
<b>LNG import</b>	1,947	2,383	2,673	2,963	2,976	2,972	3,280	2,893	2,782
<b>y-o-y</b>	-29.4%	0.5%	-6.9%	6.0%	5.4%	6.2%	16.1%	11.7%	0.9%
<b>Consumption</b>	4,013	4,598	4,923	5,333	5,339	5,199	5,628	5,156	5,137
<b>y-o-y</b>	-24.8%	-8.6%	-9.3%	-1.8%	-1.7%	-1.7%	4.3%	1.4%	-3.0%

Source: PPAC

Natural gas production in the country fell by 7.1% in December largely due to a fall in output of western offshore fields of private/JV companies. Demand for natural gas fell by 3% on a y-o-y basis after two consecutive months of positive growth indicating that pent up demand for the commodity is waning. Imports too grew by a meagre 0.9% during December 2020.

## 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 1/600<sup>th</sup> 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	95.4
Hazira	Shell Energy Pvt Limited	5	93.3
Dabhol Ratnagiri*	Konkan LNG Private Limited	5	52.0
Kochi	Petronet LNG Limited	5	16.3
Ennore	Indian Oil Corporation Limited	5	11.5
Mundra	GSPC LNG Limited	5	37.1
<b>Total Existing Capacity (as on 01.01.2021)</b>		<b>42.5</b>	

Source: PPAC

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

\*\*April-November (%)

### 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 30.09.2020**

	GAIL	GSPL	PIL	IOCL	AGCL	RGPL	GGL	DFPCL	ONGC	GIGL	GITL	Others*	Total
<b>Operational</b>													
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
<b>Partially Commissioned#</b>													
Length	3,533	-	-	23	-	-	-	-	-	442	364	-	4,362
<b>Total Operating</b>													
Length	11,774	2,265	1,460	155	105	312	73	42	24	442	364	-	17,016
<b>Under Construction</b>													
Length	6,352	-	-	1,398	-	-	-	-	-	2,335	1,678	3,780	15,543
<b>Overall Total</b>													
<b>Length</b>	<b>18,126</b>	<b>2,265</b>	<b>1,460</b>	<b>1,553</b>	<b>105</b>	<b>312</b>	<b>73</b>	<b>42</b>	<b>24</b>	<b>2,777</b>	<b>2,042</b>	<b>3,780</b>	<b>32,559</b>

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 spilt 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 (PNGRB) under the Petroleum and Natural Gas Regulatory Board (PNGRB) Act. The PNGRB 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 31<sup>st</sup> November 2020**

State	As on 1.04.2020	As on 30.11.2020	Increase in absolute terms
Gujarat	636	709	73
Delhi	419	421	2
Maharashtra	375	409	34
Andhra Pradesh & Telangana	132	145	13
Rajasthan	16	40	24
Uttar Pradesh	307	366	59
Tripura	14	11	-3
Madhya Pradesh	62	72	10
Haryana	103	141	38
West Bengal	10	13	3
Karnataka	23	37	14
Chandigarh*	11	15	4
Daman & Diu and Dadra and Nagar Haveli	15	20	5
Kerala	8	12	4
Odisha	19	19	0
Punjab	33	70	37
Uttarakhand	5	11	6
Assam	1	1	0
Bihar	8	9	1
Goa	2	4	2
Jharkhand	8	13	5
Himachal Pradesh		2	
Puducherry and Tamil Nadu		3	
All India	2207	2543	336
Change(+/-)			15.2%

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 336 CNG refuelling stations across all states during FY21 (April-November) compared with the CNG stations present during the start of the fiscal with Gujarat leading with 73 new stations and Uttar Pradesh trailing close behind with 59 stations. Nearly 76% 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. During the month of November CNG stations have forayed in the states of Himachal Pradesh, Tamil Nadu and Puducherry (Union Territory).

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 31<sup>st</sup> November 2020**

	Domestic	Commercial	Industrial
Andhra Pradesh	1,57,035	228	18
Assam	35,586	1,157	404
Bihar	19,370	8	0
Chandigarh	1,11,274	34	6
Dadra and Nagar Haveli	5,784	51	40
Delhi	9,82,353	2493	1,472
Goa	4,294	2	2
Gujarat	23,11,979	20,243	4,848
Haryana	1,66,610	404	766
Himachal Pradesh	48	0	0
Jharkhand	20,299	0	0
Karnataka	2,09,475	331	174
Kerala	42,170	10	9
Madhya Pradesh	92,179	174	269
Maharashtra	18,42,202	4,383	344
Odisha	13,871	0	0
Punjab	8,654	41	30
Rajasthan	19,936	17	58
Telangana	1,02,028	17	39
Tripura	47,305	442	60
UT part of Daman & Diu	4,149	26	24
Uttar Pradesh	8,47,953	1,466	2,087
Uttarakand	30,416	29	35
<b>Total</b>	<b>70,74,970</b>	<b>31,556</b>	<b>10,686</b>

Source: PPAC

As on 31.11.2020 (71.17 lakh connections) the total number of PNG connections has increased by 16.5% during FY21 (April-November) 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 16.6%, 3.1% and 4.2% respectively. Out of the total PNG connections domestic connections constitute 99.4% share followed by commercial connections having a 0.4% 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 15<sup>th</sup> April 2020 onwards. The government is planning to come up with the 11<sup>th</sup> 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 1<sup>st</sup> 2020 till 31<sup>st</sup> 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 <sup>st</sup> Nov'14 – 31 <sup>st</sup> Mar'15	5.05	-
1 <sup>st</sup> Apr'15 – 30 <sup>th</sup> Sep'15	4.66	-7.7%
1 <sup>st</sup> Oct'15 – 31 <sup>st</sup> Mar'16	3.82	-18.0%
1 <sup>st</sup> Apr'16 – 30 <sup>th</sup> Sep'16	3.06	-19.9%
1 <sup>st</sup> Oct'16 – 31 <sup>st</sup> Mar'17	2.50	-18.3%
1 <sup>st</sup> Apr'17 – 30 <sup>th</sup> Sep'17	2.48	-0.8%
1 <sup>st</sup> Oct'17 – 31 <sup>st</sup> Mar'18	2.89	16.5%
1 <sup>st</sup> Apr'18 – 30 <sup>th</sup> Sep'18	3.06	5.9%
1 <sup>st</sup> Oct'18 – 31 <sup>st</sup> Mar'19	3.36	9.8%
1 <sup>st</sup> Apr'19 – 30 <sup>th</sup> Sep'19	3.69	9.8%
1 <sup>st</sup> Oct'19 – 31 <sup>st</sup> Mar'20	3.23	-12.5%
1 <sup>st</sup> Apr'20 – 30 <sup>th</sup> Sep'20	2.39	-26.0%
1 <sup>st</sup> Oct'20 – 31 <sup>st</sup> 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 <sup>st</sup> Apr'16 – 30 <sup>th</sup> Sep'16	6.61	-
1 <sup>st</sup> Oct'16 – 31 <sup>st</sup> Mar'17	5.30	-19.8%
1 <sup>st</sup> Apr'17 – 30 <sup>th</sup> Sep'17	5.56	4.9%
1 <sup>st</sup> Oct'17 – 31 <sup>st</sup> Mar'18	6.30	13.3%
1 <sup>st</sup> Apr'18 – 30 <sup>th</sup> Sep'18	6.78	7.6%
1 <sup>st</sup> Oct'18 – 31 <sup>st</sup> Mar'19	7.67	13.1%
1 <sup>st</sup> Apr'19 – 30 <sup>th</sup> Sep'19	9.32	21.5%
1 <sup>st</sup> Oct'18 – 31 <sup>st</sup> Mar'20	8.43	-9.5%
1 <sup>st</sup> Apr'20 – 30 <sup>th</sup> Sep'20	5.61	-33.5%
1 <sup>st</sup> Oct'20 – 31 <sup>st</sup> 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 11.1%** during FY21. Production has fallen by 5.9% during FY20 and by 15.9% during 9M-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 31<sup>st</sup> March 2021.

**Consumption of natural gas is to fall by 2.7%.** Domestic natural gas consumption had grown by 5.2% during FY20 and has fallen by 5.3% during 9M-FY21.

- Demand is to be supported by the increase in production of urea which has increased by 3.5% during 9M-FY21. 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 0.7% during 9M-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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