Gas market in India
Overview and future outlook
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Overview of India’s natural gas market

An expanding economy and a growing population have resulted in increased consumption of primary energy resources such as coal, crude oil and natural gas in India. During 2009-2014, the country’s primary energy consumption grew at a CAGR of 5.7% to reach 638 million tonnes of oil equivalent (MTOE) in 2014. However, the share of natural gas in the country’s primary energy mix declined from 10% in 2009 to 7% in 2014 compared with the global average of 24%, mainly due to a sharp drop in domestic supplies.

India’s natural gas demand has been mainly affected by lower availability and price affordability; inadequate transmission and distribution infrastructure; and limited gas import facilities. India’s 39 cubic meters (cm) per capita of natural gas consumption lags far behind the world average of 469 cm per capita.1

Figure 1: India’s standing in the global gas market

Source: EY analysis, BP Statistical Review of World Energy 2015, World Bank

The current Indian gas market: a snapshot

1. Falling domestic gas production:

In FY10, domestic gas production received a significant impetus from the commencement of production from the eastern offshore KG-D6 block operated by Reliance Industries. However, gas supply from the block fell and averaged 11.8 million metric standard cubic meters per day (mmscmd) during the last quarter of 2014, as against the peak production of above 60

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mmcmd in 2010.\textsuperscript{2} This increased the supply deficit and affected the large gas consuming industries – power and fertilizer units. During 2014, India's domestic gas production averaged 87 mmcmd.\textsuperscript{3} Currently, the majority of gas production comes from the western offshore region and almost all of it is from conventional hydrocarbon sources. National oil companies (ONGC and Oil India) account for nearly three-fourth of the total domestic production.\textsuperscript{4} India’s gas production is set to rise in the next four-five years as discoveries on western and eastern offshore are brought on production.

The Indian upstream sector faces several challenges, including concerns on prospectivity, inadequate upstream data, changes in the fiscal regime and low domestic gas prices. The Government has indexed domestic gas prices to gas prices in the international markets – the US, Russia, Canada and Europe. This is a progressive step, as it provides market linkage and transparency in the mechanism of setting gas prices on a six-monthly basis. However, with the fall in global oil and gas prices over the last year, the upstream sector is concerned that this pricing regime is not attractive. Domestic gas prices have fallen below the earlier US$4.2 per million British thermal unit (mmbtu) levels and are set to fall further according to this formulation. This makes development of new discoveries in the western and eastern offshore even more challenging.

Figure 2: India’s gas consumption and production trends

![Figure 2: India’s gas consumption and production trends](source)

Source: EY analysis, BP Statistical Review of World Energy 2015

2. Natural gas consumption:

Power, fertilizer, city gas distribution (CGD), and refineries and petrochemicals are the key gas-consuming sectors. India's gas consumption declined from 172 mmcmd in 2010 to 139

\textsuperscript{2} Reliance Industries financial presentation, 3Q FY 2014-15; Reliance Industries financial presentation, FY 2009-10

\textsuperscript{3} BP Statistical Review of World Energy 2015

India’s natural gas market

The fall in domestic gas production and low price affordability of imported gas in the power sector has resulted in gas-based power plants remaining under-utilized. Effective plant load factor (PLF) for FY15 was 21% and nearly two-thirds of the total gas-based installed capacity (23GW) was stranded. However, the recent drop in oil prices has made spot LNG imports relatively cheaper and the power sector is expected to consume higher regassified LNG (RLNG) supplies.

Recently, the Government has taken the following positive initiatives to revive the stranded gas-based capacities in the power and fertilizer sectors by making imported LNG affordable:

- In the power sector, it is providing subsidy through a reverse bidding scheme, to allow stranded power assets to operate at 30% PLF and service the lenders.
- In the fertilizer sector, it aims to increase urea production by 3.7 million metric tonnes per annum (mmtpa) by FY19 through gas pooling policy (uniform delivery cost by averaging domestic and LNG gas prices).

Currently, more than 50 cities have been covered by retail gas distribution. However, the full

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potential of these networks will be achieved over the next three-five years. At present, the retail gas sector has more than 3 million homes, 1,015 CNG stations, 2.5 million CNG vehicles, 22,786 commercial and 6,087 small industrial users. A total of 16.5 mmcmd of gas was used by the CGD sector during 1H 2014-15, representing 14% of total gas consumption in the country. The Petroleum and Natural Gas Regulatory Board (PNGRB) has conducted five rounds of CGD bidding and is expected to close the sixth round during early 2016.

3. Growing transmission and distribution infrastructure:
India’s gas pipeline infrastructure is relatively under-developed. It currently has a network of 17,421 km of natural gas transmission pipelines with a design capacity of around 464 mmcmd (for major gas pipelines). The pipeline network has been operating at low utilization levels mainly because of gas availability and affordability issues. The PNGRB has authorized the construction of many cross-country gas pipelines (covering more than 5,000 km of pipeline network). However, the projects have not materialized due to lack of anchor customer demand, which has caused viability and financing concerns.

4. LNG bridging gas supply deficit in India’s energy landscape:
LNG plays a critical role in partially bridging the gas supply gap in the country. India is currently the world’s fourth-largest importer of LNG, behind Japan, South Korea and China. During FY10-FY15, Indian LNG imports increased at a CAGR of 11.1% to 15.5 MMT, with LNG’s share in the overall gas supplies rising from 20% to 38% during the period.

Currently, India has the infrastructure to annually import and regassify 25 mmtpa of LNG through the four terminals (Dahej, 10 mmtpa; Hazira, 5 mmtpa; Dabhol, 5 mmtpa; and Kochi, 5 mmtpa) established on the west coast. However, the actual import capacity is less than 17 mmtpa due to lower utilization of the Kochi and Dabhol terminals on account of pipeline connectivity issues and incomplete marine facilities.

There are a number of greenfield and brownfield LNG projects at different stages of conceptualization and development on the eastern and western coasts of India. Their viability and actual development is also predicated on the emergence of a robust gas market in India, with an appropriate policy framework to address the challenges faced by different segments of the industry.

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9 Petroleum and Natural Gas statistics 2014-15, MoPNG; EY analysis

10 Petroleum and Natural Gas statistics 2014-15, MoPNG

11 Petroleum and Natural Gas statistics 2014-15, MoPNG
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5. Gas pricing:

Supplies to India’s gas market are categorized into two segments: domestically produced and imported (via LNG) gas. The price of domestic gas is lower than that of LNG and is defined by the Government’s adopted indexation formula. The Indian Government has liberalized domestic gas pricing in a phased manner. From a pure administered pricing mechanism, the pricing moved to part indexation and thereafter to full indexation (introduced in 2014) as described in point 1 earlier. The Government had also indicated development of a different pricing formula for gas production from deep offshore as well as high pressure/high temperature areas, which is yet to be announced.

The price of imported LNG is higher than that of domestic gas. The Government does not exercise any control on LNG imports and the marketing of RLNG. The quantity of spot LNG imports was 7.5 mmtpa during 2014-15.

Petronet LNG has been importing 7.5 mmtpa LNG on a long-term basis from Qatar. The price was indexed to oil, linked to the 60-month average of Japanese Custom Cleared (JCC) oil prices. With the collapse in global oil and gas prices, these long-term supplies had become unviable with the contracted price at c. USD 12-13 per mmbtu vis-à-vis the spot LNG prices at USD 7-8 per mmbtu. In a recent positive development, through a renegotiated contract, Petronet LNG will now import 8.5 mmtpa of LNG from Qatar with price linked to the 3-month average of Brent crude oil prices.

Source: EY analysis, MoPNG
*Total supply includes domestic production and LNG imports

Figure 4: Increasing role of LNG imports in total gas supply*

Source: EY analysis, MoPNG

Natural gas is set to secure a bigger position in the global primary energy pie. This is underpinned by the following key factors:

- Abundant and geographically distributed gas reserves and growing global trade of gas
- Lower pollution and emission levels, which help in meeting greenhouse gas (GHG) emissions commitments
- Technological advancements expanding the applications of gas

The Indian gas market also has an opportunity to transform and grow significantly. This growth will be driven by several critical economic and social drivers emerging from India's national development agenda.

**Demand landscape:**

While there are many estimates for India's long-term gas demand (figure 5), given different assumptions around the availability, affordability and growth in key end-use segments, it is clear that India's gas demand could at least double from the current consumption levels of 139 mmscmd (in 2014) over the next 10-15 years.

The actual build-up of gas demand would be a function of the interplay of various factors and policy initiatives such as the development of clean energy sectors, pricing and cost competitiveness of gas, climate change commitments, investments in gas sourcing and supply infrastructure, and finally the development of end-use sectors. Some of these are summarized in figure 6:

**Figure 5: Varying estimates for India's gas demand**

Source: IEA World Energy Outlook 2015, PNGRB Vision 2030, 13th Five Year Plan source through Petroleum Planning and Analysis Cell website

*For PNGRB and 13th Five Year Plan, data represent the years ending March*
<table>
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<th>S No.</th>
<th>Factors/initiatives</th>
<th>Likely impact on gas demand</th>
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| 1.    | **Make in India**   | ➤ Multifold increase in energy demand  
Radical shift in India's GDP structure: manufacturing sector's share set to increase from 16% currently to 25% by 2022<sup>14</sup>  
• Requirement for more base and peak power, and heat-cooling |
| 2.    | **Renewable power generation** | ➤ Requirement of grid stability as solar and wind power are interruptible sources of supply  
Major shift in India's power generation mix with thrust on significant renewable energy capacity additions: 175GW target (non-hydro) by 2022 and 40% share of non-fossil fuel in the overall generation capacity by 2030<sup>15</sup>  
• Inherent operational flexibilities of gas-based power generation to help in grid balancing |
| 3.    | **Step up in agriculture** | ➤ Improvement in domestic fertilizer production required to support increased agricultural activities  
Requirement for significant increase in food supplies and allied products to support growing population and changing food consumption habits (“second green revolution”)  
• Gas is the preferred feedstock for production of nitrogenous fertilizers |
| 4.    | **Urbanization and urban pollution** | ➤ Retail gas distribution can help manage urban pollution, along with providing cost competitive supplies to support growing cooking and transportation needs  
India’s urban population to grow significantly; existing cities and towns to become bigger, along with the emergence of new cities and towns over the long term; many cities already grappling with alarming pollution levels  
• Expansion of city gas distribution network: more than 100 cities expected to be covered by 2022<sup>16</sup> |
| 5.    | **Green corridors** | ➤ Global (mainly the US, China and Europe) trend of commercial vehicles (medium-to-heavy duty) switching over to CNG/LNG |
| 6.    | **Intended Nationally Determined Contributions (INDC)** | ➤ Inherent qualities of gas of being an efficient and relatively clean burning energy source  
Pledge to reduce the carbon emissions intensity of India's GDP by 33%-35% by 2030 from the 2005 level in its INDC<sup>17</sup> |

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<sup>15</sup> “India’s intended nationally determined contribution,” United Nations Framework Convention on Climate Change, 25 September 2015, p. 29, 35; EY analysis

<sup>16</sup> “Vision 2030,” PNGRB, accessed 29 December 2015, p. 25; EY analysis

<sup>17</sup> “India’s intended nationally determined contribution,” United Nations Framework Convention on Climate Change, 25 September 2015, p. 29; EY analysis
Apart from the above, other factors such as the growth of India’s refining sector, setting up of chemicals and petrochemical parks and other similar industries would significantly add to gas demand in the coming years.

Supply landscape:
India’s gas supply base would need to enlarge and diversify to meet the country’s growing energy demand and address the energy security agenda. The following initiatives have the potential to boost overall domestic gas supplies over the medium-to-long-term period:

- Development of conventional and unconventional gas resources: New Government initiatives such as Open Acreage Licensing Policy, revenue sharing model for new contracts, and unified licensing, gas marketing and pricing freedom under the Marginal Field Policy
- Augmenting LNG import capacity through brownfield expansions and commissioning of greenfield terminals
- Development of transnational gas pipelines such as Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline, and imports through sub-sea pipelines from Iran (SAGE pipeline project)

Realizing the potential of these initiatives depends upon a robust policy framework and proactive steps taken to address industry concerns in various aspects of the gas sector.
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