

June 2017



THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

India's Gas Market Post-COP21

Executive Summary

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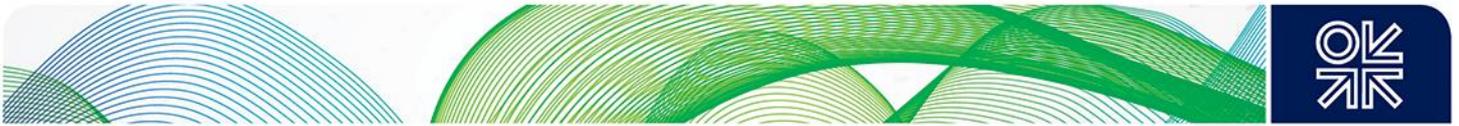
A number of factors have put India back in the spotlight as a potential future growth market for gas. Among these are: the decline of gas in European energy balances, the US's transformation from energy importer to exporter, a tempering in China's rapid pace of economic expansion and energy consumption, and the expectation of an oversupplied gas market up to the mid-2020s. The view on gas from within India has, on the other hand, been in constant flux over the last decade, with no realistic vision or long-term objectives on its role in the energy mix. No confident assessment of gas demand in India has been possible so far, as the Indian gas market as a whole has been comprised of two segments: one using gas allocated at government-controlled prices, and the other paying market prices for imported LNG. Some degree of overlap between the two segments makes the picture even messier. Consequently, government projections of future demand have tended to be over-optimistic, and international assessments by multilateral institutions cautious yet confused. Yet, a developing country of over one billion people cannot be confidently dismissed as an important future centre of energy demand. In other words, India is a 'wildcard' in the global gas market.

Following the global oil (and gas) price downturn since mid-2014, there have, however, been several notable developments which indicate that the outlook may be changing. The short-term developments include:

- a significant rise in imports of Liquefied Natural Gas (LNG) in the last couple of years— with import dependency rising from 27 per cent to 47 per cent of total gas consumption between March 2014 and February 2017 – driven largely by the fertiliser, city gas and industry sectors;
- the government's stated intention to double the share of gas in India's primary energy mix to 15 per cent "within 3-5 years" through "doubling LNG imports", accompanied by statements of intention to "shift India to a gas-based economy";
- higher prices – linked to a basket of coal, fuel oil, naphtha and LNG – for domestic gas produced from deep water, ultra-deep water, and high temperature high pressure fields; and,
- the launching of an open acreage licensing (OAL) regime allowing companies to initiate bidding for prospective blocks, and instituting a single license for the exploration of conventional and unconventional resources.

At the same time, there have been a series of parallel connected developments in the wider energy sector that may be construed as longer-term determinants that could influence the role of gas:

- India's ratification of the COP21 agreement, with targets on increasing the share of 'non-fossil-fuel' electric installed capacity to 40 per cent, and reducing the emissions intensity of GDP by 33-35 per cent over 2005 levels, by 2030;
- a domestic non-binding target to increase the share of renewable installed electric power capacity to 175 Gigawatts (GW) from roughly 57 GW at present;



- the expectation that no new coal power plants would be needed, beyond those already under construction (around 50 GW), until at least 2027; the retirement of plants over 25 years old (comprising around 20 per cent of the fleet) with some fleet replacement; and,
- a drive to curb air pollution in Indian states and cities, visible in the transport and coal-based power generation sectors.

This paper disentangles the short-term developments and dynamics of demand in the main gas consuming sectors (power, fertilisers, industry and city gas), from the influence of longer-term determinants (global LNG prices, renewables policy, coal policy and associated air quality issues, and infrastructure) as enablers or constraints on the future outlook for gas.

Short-term drivers

The LNG import 'upsurge' in recent months has been driven predominantly by the industrial sector (petrochemicals, refineries, LPG shrinkage, iron and steel, and other industry) – which accounted for 45 per cent of LNG imports consumed between December 2015 and February 2017; followed by the fertiliser sector – which consumed roughly 30 per cent; and the city gas sector – which consumed a relatively lower 12 per cent of imported LNG but had the fastest growth (30 per cent) in consumption, albeit from a low base. Consumption of LNG imports by the power sector fluctuated over the same period, rising from roughly 14 per cent of LNG imports in December 2015 to 17 per cent by March 2016, but declining to 7 per cent by March 2017 following the end of a 2-year subsidy to gas-based power generators. These trends are likely to continue going forward:

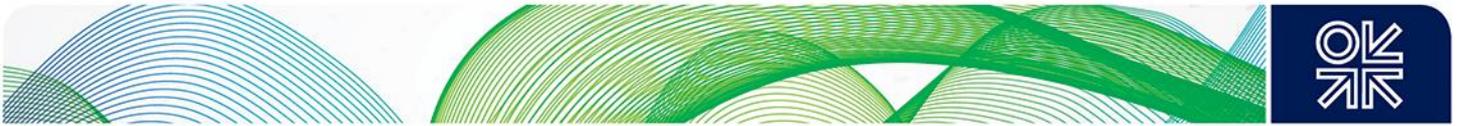
- Growth in the fertilisers sector is likely to be underpinned by the expansion of predominantly gas-based urea manufacturing capacity from 25 to 38 Mtpa by 2024, the cessation of urea imports within 5 years, and the price inelasticity of gas demand due to a manufacturing and retail subsidy;
- Growth in the industry sector will be underpinned by a policy target to expand manufacturing's share of GDP from 15 to 25 per cent by early next decade; and,
- Growth in the city gas sector will be driven by policy targets to roll out city gas infrastructure across several cities, and by the price competitiveness of city gas with its main substitutes (gasoline and diesel in transportation, and Liquefied Petroleum Gas in the household sector).

In contrast, gas is likely to play a limited role in the power sector, unless its comparative advantage as an environmentally 'cleaner' fuel relative to coal is explicitly taken into account, either through the provision of a subsidy to gas-fired power, or through the imposition of an equivalent tax on coal-fired power.

Longer-term determinants

The paper identifies four main longer-term determinants that are likely to influence the aforementioned short-term economics, thereby shaping the broader outlook for gas demand.

- *Global gas prices:* future LNG price levels will be an important determinant of gas demand in India, given the lack of firm commitment to gas in the energy mix, as well as the expectation of an oversupplied international LNG market. Changes in gas consumption in India have tended to lag changes in gas prices, and it is reasonable to expect that gas consumption in key Indian economic sectors will continue to rise with low gas prices. However price formation mechanisms will also be critical to the outcome; given that oil products are competitors to gas in several sectors, if LNG imports continue to be based on oil-linked contracts a decline in oil prices would precede a decline in gas prices, thus limiting the potential for gas to grow across the Indian economy.
- *COP21 and Renewable Commitments:* The success of the 175 GW renewables target will depend on adequate capacity addition, the ability to contract solar capacity at competitive tariffs, and the capacity of grid infrastructure and regulations to handle intermittent renewables. Although India has achieved record low solar tariffs in recent auctions, these do



not fully account for the costs of intermittency and the fact that costs of integration may increase further as solar is scaled up. There are associated concerns around 'aggressive bidding' in solar auctions, the ability of developers to deliver capacity to schedule, and the ability of utilities to offtake solar power, especially as the costs of intermittency increase. The role of gas has not been seriously taken into account in relation to balancing intermittency as well as bridging potential shortfalls in the renewables target.

- *Coal in the Energy Mix and Associated Air Quality Issues:* The paper analyses two main countervailing factors which will shape the future outlook for coal, in relation to gas: on the one hand, a push by the federal government to increase coal production, cease coal imports, supply the electricity sector with sufficient fuel to mitigate shortages, and provide universal and reliable access to electricity to all households by the end of this decade. And on the other hand, the imposition of fiscal measures and environmental restrictions on the burning of coal in order to reduce air pollution and particulate matter emissions, partly in response to litigation brought at the state and city levels by citizens concerned over worsening urban air quality.
- *Infrastructure:* Infrastructure lies at the heart of optimising India's potential as a major gas market. There are two main bottlenecks: firstly, pipeline infrastructure is not being built quickly enough to support demand in growing regional markets and secondly, parts of the existing infrastructure remain underutilized. The paper identifies three factors that have impeded progress on building gas infrastructure: first, the so-called 'commodity versus carrier' problem, second, issues around the 'right to use' land – a legislative provision accorded to infrastructure companies in the laying of pipelines, and third, a lack of clarity around the mandate and autonomy of the downstream regulator, which administers tenders for city gas infrastructure and for retail city gas sales licenses.

The future of gas in India

Based on the above, the paper presents three illustrative outlook cases for the future of gas in India:

- A continuation of the *status quo* to 2024, where gas demand growth will continue to be driven by underpinning policy targets in fertilisers, industry and city gas, which could form a limited but reliable demand base for gas, and which will continue to grow comfortably in the short term, with some potential to scale up thereafter. This outlook sees gas demand in these sectors growing by around 40 percent from 2015 levels, to 2024. The main constraint to this outlook is infrastructure.
- A role opening up for gas to 2027 in the likely event that India fails to fully meet its renewables target – although this would present significant opportunities for gas demand, which could increase by an additional 45 Bcm by 2022 and higher thereafter (to 2027), this role is constrained by prices, infrastructure, renewables policy and coal policy.
- An outlook in which coal to gas switching is proactively encouraged through fiscal policy in the power sector, opening up an important and immediate role for gas to 2027 and beyond. This could lead to a substantial and anchoring role for gas in the power sector, but would require a nearly fivefold increase in the 'coal tax' and a potential 30 per cent increase in associated electricity tariffs, which also makes this a highly improbable outlook. This outlook is constrained by renewables policy and policy on coal and air pollution.

A likely outcome is some combination of the first two outlook cases. More importantly, this paper emphasises the highly dynamic nature of the Indian market post-COP21, making the point that the short-term dynamics and longer-term determinants could effectively be studied in a number of combinations and permutations, in order to gain a better understanding of the Indian market as it evolves and develops towards meeting India's key energy policy goals.
