

**India's gas sector
Can LNG co-exist with domestic natural gas?**

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Executive Summary

Circa 1974, with the huge oil & gas discovery in Bombay High field in 1974, followed by the giant South Bassein free gas find in 1978, the question then was "*How to develop a market for this gas?*" The answer then was GAIL and the HBJ pipeline. Ten years later, the scenario turned 180 degrees, when the gas demand exceeded the supply and the question changed to "*How to find more gas?*" The answer then was NELP and CBM. Now in the year 2005, with huge indigenous gas finds and LNG cargos reaching the Indian shores, along with the prospects of the burgeoning demand due to rapidly growing power, industrial and nascent retail gas segments; Indian gas sector is in a state of tumult. It is transforming itself from an industry with few dominant players, large demand- supply gap, geographically concentrated reserves, largely regulated prices ,highly regulated consuming industries and near-monopoly in gas transportation to an industry with many players, increasing demand and supply, geographically diversified supply sources ,increasing share of unregulated gas, consuming industries undergoing reforms and deregulated transportation.

However, the extent of transformation will be determined by the nature of deregulation in the Industry and the innovative practices LNG importers adopt to survive in a price-sensitive market where they are at a disadvantage due to high fixed costs and import duties.

Introduction

For a country like India, burdened with a soaring oil import bill, the use of natural gas is an imperative. Domestic gas supplies have, however, proved inadequate for meeting domestic requirements in the past despite efforts by the government to increase private exploration activity through initiatives like NELP. With inadequate indigenous production, there was a need for importing gas either in liquefied form or through the pipelines.

Since transportation costs of sourcing LNG are very high; its liquefaction (which reduces its volume by 600 times) has been the most attractive of all the options. Another reason why LNG has become increasingly acceptable as a mode of transporting gas is also because costs have fallen across its supply chain. Given the feasibility of importing LNG, the government approved the formation of Petronet LNG in 2001 to develop gas terminals and import gas from RasGas, Qatar.

.After a lapse of four years, Petronet's 5Mt LNG project has seen the light of day, and Shell's 2.5Mt facility is well on its way to being commissioned by the end of this year, which means India will be importing 7.5 Mt of natural gas in liquefied form.

Another landmark change in the history of natural gas industry was the discovery of over 11 TCF of natural gas reserves in the KG basin, which on production will yield around 20mcmd of gas.

These changes have drastically altered the natural gas market from a supply constrained scenario to a multi-source, multi-market entity.

Industry Characteristics

- **Consuming Industries:**

Natural gas is used as fuel in power plants and industries like glass, ceramics, sponge iron and tea estates - and as a feedstock in fertilizer and petrochemical plants; with power sector being its largest consumer followed by fertilizers (accounting for 38% and 25% of gas consumption respectively in 2002-03)¹.

Natural gas is the most popular feedstock for fertilizer sector (accounting for 41% of the nitrogenous capacity)² because of ease of manufacturing ammonia from methane and higher capacity utilization of NG based plant vis-à-vis other feedstocks. Even in power generation, natural gas is preferred as a feedstock since natural gas-based power projects have a lower gestation period as compared to coal based power plants. In spite of these positives, the use of natural gas has been limited due to inadequate supply. Due to the shortage of gas, several power and fertilizer plants have been using high cost alternative feedstock.

Transport sector is also fast emerging as a potential source of demand for natural gas, given the high cost of petrol and diesel and concerns regarding pollution. CNG and City Gas Distribution have already been successfully introduced in the cities of Delhi and Mumbai. Given the environmental concerns, the Supreme Court of India has issued a directive to introduce CNG in 11 more cities which will lead to large scale adoption of CNG as a transport fuel.

1, 2 .Source: Crisinfac Fertilizers Annual Review: March 2004

Reforms in Consuming Industries and their Implications for LNG

Reforms in the power sector

The provisions of Electricity Act, 2003 and their implications are discussed below:

- ***Delicensing of Captive power plants***

The removal of licensing requirement will enable industrial consumers to set up captive power plants and avail power at cheaper rates as the power tariffs for industrial consumers are very high due to cross- subsidization of domestic and agricultural consumers

- ***Open access to transmission lines to independent power producers***

This will allow IPPs to bypass the financially weak State Electricity Boards, resulting in improvement in payment security of projects, which is beneficial for the gas sector especially LNG marketers.

- ***Prescription of power dispatch to the state grids on 'merit order' rankings of plants, merit being defined in terms of unit price for supplying electricity***

Since plants operating on gas have a significant cost advantage over all plants, except those running on coal, the consumption of gas will receive a boost under the merit order dispatch system.

Implications

LNG projects, which require investments in excess of \$1 billion, can't be viable unless bulk buyers in the power sector patronize them. But as bulk buyers, power producers have the clout to dictate prices. For LNG to compete under merit order dispatch system, its delivery price has to fall down to \$3.20 per MMBTU from the current price of \$4.3 to \$4.6 MMBTU.³

3. Source- Article : "Fuelling the Future" - Business India, Sept 12 Edition, 2004

Reforms in Fertilizer Sector

- ***New Group Concession pricing scheme***

Under this scheme, reimbursements given to fertilizer units would be calculated as the lower of average cost of production (for a given group of units), and their own cost of production. Thus, an inefficient unit would make losses, as it would receive only the group average cost of production. This emphasis on efficiency will encourage gas usage, leading to increased gas demand.

- ***Long-Term Urea Policy***

Under this policy, urea plants that switch from naphtha and fuel oil to gas will be allowed to retain the benefits of the operational efficiency arising from the conversion for a maximum period of 5 and 10 years respectively.

Implications

The reimbursements of production costs are based on price of up to \$3 per mmbtu for natural gas and \$3.5 per mmbtu for LNG, beyond which the cost has to be borne by the manufacturer concerned. Since, the price offered by Petronet ranges between \$4.2 mmbtu and \$4.6 mmbtu, fertilizer players are waiting for either LNG players to reduce gas prices or for the government to revise the gas price assumption. Hence, the new policies are not expected to lead to any significant capacity additions over the next 5 years.

Pricing

The price of gas produced by domestic producers is a controlled price (75 % of the international price, though the government is considering an increase in linkage to 100 per cent). To prevent volatility in prices, the government has fixed a price band of Rs 2,150 per

tcm as the lower limit and Rs 2,850 per tcm⁴ as the ceiling . On the other hand, prices of gas produced by private players and LNG terminals are de-regulated. However, at present, the gas from NELP blocks and private players constitutes a small portion of gas supplies, which implies that most consumers in India are used to a highly subsidized price. Further LNG is at a disadvantage in pricing vis-à-vis domestic gas due to high investment involved in setting up gas terminals, 5%⁵ import duty on oil and an effective duty of 21.8% ⁶ on capital equipment as LNG terminals have not been given infrastructure status

- ***Scope for reduction of LNG prices***

The delivered price of LNG comprises a number of cost components discussed below:

Sales tax: Given high sales tax rates on gas in India, LNG players have been demanding that LNG be given the status of a 'declared good', which would ensure that the central sales tax rate of 4 per cent would apply for sale in any state. The recent reduction in tax on natural gas to 12.5% by Gujarat state government has lowered the delivered price of LNG to \$4.33 per mmbtu in Gujarat which will still not make LNG a viable option for fertilizer industry.

Regassification charges and pipeline tariffs (only in the case of Petronet due to GAIL's stake): These are the only large components of the delivered price, which are under the control of the LNG players. However, regassification charges are already low and will only be reviewed after 3 years. Further, the pipeline tariff will be increased by 5 per cent every year.

4. Source- www.indiainfraonline.com 5, 6 Source- Article: "Fuelling the Future" - Business India, Sept 12 Edition, 2004

Liquefaction charges : In case of Petronet LNG, a reduction in liquefaction charges (which form the largest cost component) due to technological advancement would not result in a drop in prices since prices are linked to crude oil and have already been fixed for 5 years.

Since 80% of the cost components are not within the control of LNG players, it is unlikely that Petronet LNG will be sold at a delivered price of \$3.5 per MMBTU. However, Shell will have higher flexibility in pricing its gas as LNG will be supplied from Shell's own liquefaction terminals, allowing it to transfer the benefits of reduced liquefaction charges to customers.

Further, the speculation that LNG is likely to emerge as the benchmark price for India due to willingness of private players to capture more profits has been put to rest by RIL's bagging of NTPC's recent contract, where its bid was a mere \$2.97. Indications are that it's the competition between LNG suppliers to grab the bulk contract that will eventually determine the benchmark prices. Also, given the government's desire to reduce the subsidy outgo to the fertilizers sector and the financial condition of fertilizer players, there is a possibility that differential pricing will emerge in India, wherein fertilizer players will be supplied gas at a lower price. However, this move is likely to be strongly opposed by players in the power sector and will not be easy to implement.

Nature of Demand

In India, demand for natural gas is constrained by supply. The size of the market for gas in India and its ability to absorb the increasing supplies, depends to a large extent on the availability of gas in various regions and the pricing of gas.

Supply Situation in 2006-07

Assuming a gas production of 20 mmscmd from Reliance's KG basin fields from 2007 onwards, there will be a surplus of 14.85 mmscmd in the gas market in 2007-08. However, this would not result in a surplus as a number of projects, especially in the power sector, which have been put on hold due to the shortage of gas, will become viable. Even if half of the stalled power project proposals materialize, an additional demand of 37 mmscmd can emerge by 2007-08, leading to a deficit of around 27 mmscmd⁷. Thus, it is clear that the Indian gas market will be able to absorb the increasing gas supplies in the medium term; however the deficits will decline sharply due to increased production from RIL's fields.

Contractual features

Given the high investment in setting up an LNG terminal, it is important that all elements in the supply chain be tied up simultaneously, in order to ensure the bankability of the projects. Hence, the LNG chain is dedicated to specific long –term contracts to mitigate the risk associated with the investment.

Petronet's contract with RasGas is a 25 year take-or-pay contract. Such contracts transfer price risk as well as the volume risk to the buyer as besides paying a fixed price over the term of the contract, the buyer is obliged to pay for a fixed volume annually even if its gas requirements have decreased over time. The purchase price for the gas is usually linked to the Japanese Customs Cleared (JCC) crude oil prices with a floor and ceiling agreed in advance. In the case of Petronet, the floor and ceiling price for the gas supplied by RasGas will be \$16 and \$24 per barrel respectively.

7. Source- Crisinfac industry report

On the other hand, Shell has neither tied up with consumers nor with international suppliers for the 2.5 Mt it will bring to India annually. It is being speculated that it is banking on taking advantage of the shortfall (7 mmscmd in Sept, 2004) in GAIL's gas supply to Panvel and Mumbai from Uran. It also intends to develop a spot market by buying seasonal LNG surpluses from global markets and selling them on the spot along the HBJ pipeline.

The expectations of Indian LNG market evolving into a flexible market are also reflected in GSPCL's move of tying up with the National Commodities and Derivatives Exchange in Mumbai to set up a gas exchange, which would factor in all the risks in a single gas price. These expectations are not so far-fetched, given that consumers in India have successfully reduced the duration of contracts between consumers and distributors to 3-5 years from the international average of 15 years. Even for most consumers who have signed contracts with 'take or pay' clauses for lifting 90 % of their annual requirements, the actual requirements fluctuate seasonally given the fluctuating demand for power and fertilizers. In such cases, the spot market would give them relief against the rigid contractual arrangements demanded by suppliers. Also, Cairn, Nikko, and Shell - the three private sector producers/ importers of gas, and Petronet, are all connected with GSPCL's pipeline network in Gujarat, which is crucial for developing the spot market.

Further, with the current uncertainty regarding the price at which the gas will be available from various sources, users may refuse to accept long-term contracts with LNG suppliers. To that extent, the economics of LNG projects may be affected, leading to increased

flexibility in negotiating short-term and spot contracts, both at the LNG supplier and user level.

Scope for De-regulation

Indian gas market lacks certain characteristics: an extensive pipeline infrastructure, a more balanced demand-supply equation, the existence of an independent regulator, the unbundling of marketing and transportation companies and depth in the market (in terms of consumers and suppliers), which form the pre- condition of deregulation of an industry.

Recommendations

- ***Development of Transportation Infrastructure***

The increase in supply notwithstanding, consumers will actually emerge only if the transportation infrastructure exists. The existing infrastructure in India is controlled primarily by GAIL and is not adequate to meet the requirements of the expected supply. While the existing capacity needs to be expanded, new infrastructure development is also necessitated by the large gas discoveries in the southern India where there are no pipelines. Traditionally, demand centers developed around the supply sources and along the pipeline network. But with the increasing availability of gas, the government's objective will be to ensure the development of a gas market across the country, which will only occur through the development of supply infrastructure across the country.

- ***Need for a transparent Gas Policy***

The resolution of ambiguity in the policy, clear demarcation of the jurisdiction of the Centre and State governments and the introduction of measures to prevent unfair competition will be essential for building confidence among players and ensuring the development of an

integrated gas market in India. Moving towards a scenario where supplies will be increasingly dominated by gas from private players and importers, regulatory issues regarding pricing and rationalization of taxes and duties need to be resolved. An independent regulator is required to oversee issues like avoiding redundancy of pipelines, equitable tariff design, open access to the pipelines and use of excess capacity. These issues have gained more significance now that GAIL's monopoly over (trunk) pipelines has been abolished by the recently modified Gas Pipeline Policy.

- ***Adoption of Innovative practices by LNG importers***

For LNG is to successfully compete with existing fuels, the importers need to develop innovative pricing structures, contractual terms, innovative logistics and LNG transportation solutions like swapping of cargoes that take into account the industry's changing characteristics. They should seek new risk distribution models wherein buyers shall undertake the risks and rewards that were so far considered to be under the domain of the sellers only.

Recent Proposals

- ***Proposal by Shipping Ministry of India***

A recent proposal by Shipping Ministry of India mandating that LNG be imported only on Indian ships, if implemented, would force LNG importers to hike transportation costs and significantly add to the onshore price of LNG. Instead of forcing non-competitive transport costs (given the stagnant shipping capacity and inexperience of Indian shipping companies in LNG), the government needs to facilitate LNG importers to competitively seek efficient, least-cost shippers to best manage sourcing and overheads.

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