Shale Gas Development:
Another Avenue for India-US Co-operation

By Manish Vaid & Tridivesh Singh Maini

One of the biggest trends in US energy over the past decade has been the surge in natural gas extracted from shale rocks, which accounted for only 1 percent of US natural gas output in 2000 but reached 20 percent by 2010. Over the next two decades, it is expected to account for almost half of all US natural gas.

As Manish Vaid and Tridivesh Singh Maini write, the US shale gas boom is another potential source of India-US co-operation as energy-hungry India looks to the US to help develop its own shale gas sector.

The boom in shale gas production in the United States has become a hot topic among energy analysts and policymakers, including in India, where falling domestic natural gas production, coupled with rising crude import bills, has further shifted interest toward the US shale gas success story.

India is currently meeting its domestic gas shortfall with costlier liquefied natural gas (LNG). Consequently, sectors such as petrochemicals, refineries and urban gas utilities, demand from which is relatively price inelastic, have been relying on imported fuel and passing the higher costs to consumers. Core sectors such as power and liquefied petroleum gas (LPG) extractors are mostly shut down. The rise in crude import bills, meanwhile, is straining India’s fiscal deficit, which reached US$88 billion in 2012-13, or 4.8 percent of gross domestic product (GDP).

In response, the government has started to explore alternatives in a more aggressive manner. These include augmenting domestic oil and gas production; reforming the National Exploration Licensing Policy (NELP); focusing more on unconventional energy resources such as shale oil and gas, coal bed methane and gas hydrates; exploring more difficult terrain such as deep and ultra-deep waters; seeking new gas pricing policies to make domestic production more viable; and looking to the US not only for co-operation in shale gas and gas hydrates, but also for cheaper LNG imports. But it is the shale gas bonanza in the US that is attracting considerable attention, as well as America’s willingness to support India in developing this sector. The two countries signed a memorandum of understanding on Nov. 6, 2010, involving US co-operation to help India develop shale gas.

As a result, India’s Directorate General of Hydrocarbons (DGH) produced the Draft Shale Gas Policy in 2012 and sought public opinion on
exploration and exploitation of shale oil and gas in India from various stakeholders, including experts in the oil and gas sector, environmentalists and non-governmental organizations.

RISING DEMAND, FALLING PRODUCTION

India’s overall energy consumption continues to increase significantly due to population growth, urbanization and economic development, with oil and coal occupying the largest share of India’s energy basket (see Chart 1). In 2012, oil and coal accounted for 30 percent and 53 percent, respectively, of total energy consumption, an increase of 9.86 percent and 10.16 percent, respectively, since 2010. Consumption of natural gas, meanwhile, decreased by 11.85 percent during the same period, accounting for just 8.71 percent of total energy consumption, thanks to a steep fall in gas production at Krishna Godavari basin’s KG-D6 field. The decline in oil output has been largely due to water loading and sand ingress in wellbores. In 2012-13, output of D1, D3 and MA combined was 27 mmmscmd against an estimated capacity of 86.73 mmmscmd as per approved field development plans.2 The decline in domestic gas production forced the Indian government to purchase costly LNG on a spot basis, thereby putting further strain on India’s fiscal deficit, which widened to its worst level in a decade.3 Indian companies, in order to secure long-term energy supplies, also moved to imported crude.4

The fall in consumption is due purely to supply constraints. The production of gas in KG-D6, which peaked at 69.42 million metric standard cubic meters per day (mmmscmd) in March 2010, declined to just 11.8 mmscmd by the first week of January 2014 (see Chart 2).1 KG-D6 comprises 18 gas producer wells in the D1 and D3 fields and six in the MA fields. The decline in output has been largely due to water loading and sand ingress in wellbores. In 2012-13, output of D1, D3 and MA combined was 27 mmmscmd against an estimated capacity of 86.73 mmmscmd as per approved field development plans.2

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Being unable to meet domestic energy needs through indigenous production of oil and gas, India is now expected to become a regular importer of natural gas because of problems with domestic natural gas supplies.4 This situation, coupled with robust natural gas production in the United States, pushed India to explore various options including ways to increase domestic unconventional gas, particularly with help from the US.

The US has agreed to co-operate with India in augmenting its domestic shale gas resources as well as in providing cheaper gas through LNG exports to India. Indo-US shale gas co-operation would be in addition to existing energy ties between the two nations.

INDO-US ENERGY CO-OPERATION

Fully-fledged Indo-US energy co-operation started during the launch of a bilateral energy dialogue on May 31, 2005.5 Five working groups were created, supervised by the heads of a steering committee from both sides. The dialogue covers co-operation in promoting trade and investments in the oil and gas sector; advanced understanding of power generation and distribution; developing co-operation on clean coal technologies; promoting energy efficiency and renewable energy sources; and dialogue and action on issues related to the civilian use of nuclear energy.6

The next major development in Indo-US energy co-operation was the signing of a civilian nuclear deal on Oct. 10, 2008,7 also regarded as one of the pillars in building up the Indo-US strategic relationship.8 So far, though, there has been slow progress in this area largely due to a lack of clarity over liability in the case of an accident. Unlike General Electric, which has backed out of the nuclear sector in India,9 Westinghouse is optimistic about its nuclear energy prospects in India, according to company senior vice president, Jeff Benjamin.10

It is in the area of unconventional hydrocarbon resources such as shale gas and gas hydrates that the US can play an important role in supporting India’s energy security. Initial estimates made by the US Energy Information Administration (EIA) in April 2011 put the shale gas potential of India at 63 trillion cubic feet (tcf),11 but it has subsequently revised upward its estimates to

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5 The Economic Times. www.thehindubusinessline.com/industry-and-economy/rising-demand/416240.ece

6 Ibid.


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96 trillion cubic feet.12 The US Geological Survey (USGS), meanwhile, in January 2012 estimated potential shale gas resources in basins within Bombay, Cauvery, and Krishna-Godavari provinces at 6.1 trillion cubic feet,13 but it has agreed to re-assess this earlier estimate. The memorandum of understanding signed between India’s Ministry of Petroleum and Natural Gas and the US State Department in 2010 included an energy resource assessment by the USGS, co-operation in technical studies to start exploration in India and the provision of training to Indian personnel.14 Implementation of these objectives by the US could bolster implementation of India’s shale gas policy when it is finalized. The advanced technology and tested business models of US companies in the shale gas industry could give Indian oil and gas companies a boost in attracting greater foreign investment.15 In the meantime, as India develops its own shale gas industry, US shale gas exports to India are expected to benefit both countries, according to a report by analysts at NERA Economic Consulting.16 Some in the US also argue that these LNG exports could help deepen relations between the two countries. US Congressman Charles W. Boustany, a Republican from Louisiana, said: “LNG exports could facilitate stronger bilateral relations with India, but an investment treaty will need to be signed and service agreements developed first.”17

THE FUTURE OF CO-OPERATION

Indo-US energy co-operation is heading toward greater development of unconventional hydrocarbons such as shale gas in India as well as filling the supply gap for domestic gas through LNG imports from the US, which are comparatively cheaper than LNG imports from other countries. This could certainly provide some cushion to India’s two most sensitive sectors, power and fertilizer production, because they have started to rely more on LNG imports. These sectors, however, will have to wait a bit longer for India’s indigenous gas production to show some reversal of its recent downward output trend. Domestic shale gas production will play a significant role, but not before some grueling efforts by the Indian government on various issues pertaining to the environment, water and land availability, the fixing of the domestic gas pricing issue, a favorable regulatory regime and the removal of infrastructure bottlenecks. Progress on all of these fronts is a precursor to enhancing domestic natural gas availability in India. But with the prospect of greater co-operation between India and the US in the area of shale gas development, some in India are already taking advantage of that co-operation. Gas Authority of India Limited (GAIL), for instance, which has a 20 per cent stake in Carrizo’s Eagle Shale acreage and has signed a deal with Cheniere Energy Partners to buy 3.5 million metric tons per annum (mtpa) of LNG from Sabina Pass Liquefaction from 2017-18, is now mulling a “time-swap” deal with US shale gas suppliers that it can import shale gas by 2015-16 instead of 2017-18.18 Therefore, the main thrust of such co-operation will remain focused on augmenting domestic natural gas availability, including discoveries in shale gas resources in India, with institutional, regulatory and technological support from the US in the near future. Such co-operation is also expected to take into account “above-ground factors,” which are extremely difficult and different from those in the US. This needs to be understood by Indian policymakers, given that one of the largest bottlenecks in India has to do with the availability of water and land — both of which are key to shale gas development — because these have clear impacts on the socio-economic conditions of the common citizen. Some of the other “above-ground factors” include the land and mineral rights of landowners, prospective areas of shale basins in agricultural land and bureaucratic delays in implementation of projects due to the multiple clearances required.

There are also issues related to differences in geology, and India could benefit from US technology and expertise in these areas. For instance, looking at the quality of shale rock in India, which is softer and ductile, a different set of technologies will be required. In the US, shale rocks are hard, and gas is therefore more easily extracted. Given the critical oil and natural gas situation in India, shale gas co-operation with the US is essential, but India would like to take this further to explore other energy sources such as renewable energy, given serious concerns about the environment.

CONCLUSION

Indo-US relations have come a long way since 1998, when the US imposed economic sanctions in response to a nuclear test by India. The administration of US President Barack Obama has gone the extra mile to strengthen the nascent strategic relationship with India. While the Indo-US civilian nuclear deal remains the foundation of existing energy collaboration, co-operation in shale gas and other unconventional oil and gas resources will give further momentum to the partnership, both economically and politically. US support for India’s energy security will certainly help improve the Indian economy and should further strengthen the bonds between the two countries, which were strained last December with the public outcry in India over the treatment of an Indian diplomat arrested in New York, which at the time seemed to threaten the bilateral relationship.

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