India’s Import Diversification Strategy for Natural Gas: An Analysis of Geopolitical Implications

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ABSTRACT India’s domestic production of natural gas can only partially fulfil the expected increase in demand in the coming years, and the country will have to increase its imports to fill the gap. Such dependence on external sources makes the country’s energy security vulnerable to regional and global events. As global demand for natural gas is projected to increase, India must ensure a robust natural gas import diversification strategy. This paper makes a geopolitical evaluation of India’s energy relationships with gas-producing countries, the changing geopolitical dynamics of natural gas markets, and the implications for India’s import strategy. It explores some of the LNG import strategies of prominent consumer countries to evaluate if they can present any competition, or otherwise opportunities, for India’s own gas strategy.

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INTRODUCTION

India requires a sustained supply of energy to support its ambitious growth and welfare targets for the coming years. A study by the government think tank, NITI Aayog has pointed out that India’s energy consumption is expected to reach 2,300 million tonnes of oil equivalent (mtoe) by 2047, of which natural gas will contribute 173 mtoe under the determined effect scenario.

Natural gas is a clean fuel that has wide-ranging utility in the energy and non-energy sectors. It can be used for power generation, city gas distribution (CGD) to support domestic activities, as an alternative fuel for the transportation sector, fertiliser and petrochemical industries and in certain other industries. Within the power sector, natural gas has received little traction primarily because the per unit cost of electricity generated by a gas-fired power plant in India is higher than that from fossil fuels such as coal. Moreover, there has been a shortage in the supply of gas for the power plants. Filling the gap with imported gas cannot be a solution, however, given the financial non-viability of gas sourced from abroad.

The Government of India has set the goal of installing generation capacity of 175 Gigawatt (GW) of renewable energy by 2022. Given the limitations of renewable energy in supporting the peak energy demand in the evenings, gas-fired power plants can perform the critical role of grid balancing to ensure continuous supply of power. With adequate government support, the generation capacity of stranded gas power plants can be increased, leading to higher share of natural gas in electricity generation without any addition of new gas-fired power plants.

Demand for natural gas in India is projected by different international agencies to increase in the coming years (See Table 1). The draft National Energy Policy released by NITI Aayog estimates that the share of gas in India’s primary energy mix would rise (about 8 to 9 percent under a conducive ecosystem) by 2040. This would lead to a substantial increase in the use of gas in terms of absolute volumes. The government aims to increase the contribution of natural gas to the energy mix from 6.6 to 15 percent by 2030.

Indeed, in the past five years, the government has worked on building infrastructure for boosting the growth of natural gas in the country. It intends to increase the coverage of CGD network in the country to cover 70 percent of India’s population across 50 percent of the country’s geographical area. Investments worth US$ 2.8 billion are being planned by the Indian Oil Corporation for gas distribution to homes, industry and transportation sector. The Ministry of Oil and Natural Gas in its 2018 year-end report says it is working towards constructing an

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a Within this renewables mix, solar energy would comprise of 100 GW, followed by wind energy at 60 %, biomass energy at 10 % and small hydro at 5 %. For details see - Press Information Bureau, “A target of installing 175 GW of renewable energy capacity by the year 2022 has been set 100 GW of solar capacity by 2022 in the country”, 19 July 2018 (accessed on 16/August/2019)
Table 1: Natural Gas Demand Projections for India (in billion cubic metre)

<table>
<thead>
<tr>
<th>Agency</th>
<th>2017 (BCM)</th>
<th>2040 (BCM)</th>
<th>Share of natural gas in total primary energy demand in 2040</th>
<th>CAGR (2017 to 2040)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td></td>
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<tr>
<td>A - Current policies</td>
<td>54</td>
<td>161</td>
<td>7%</td>
<td>4.8%</td>
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<tr>
<td>B - New policies</td>
<td>54</td>
<td>163</td>
<td>8%</td>
<td>4.8%</td>
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<tr>
<td>C - Sustainable policies</td>
<td>54</td>
<td>234</td>
<td>16%</td>
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<td>2</td>
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<tr>
<td>BP</td>
<td>54</td>
<td>185</td>
<td>8%</td>
<td>5.5%</td>
</tr>
</tbody>
</table>

Source: IEA World Energy Outlook 2018\(^1\), BP Energy Outlook 2019\(^4\)

Figure 1

Consumption of Natural Gas in India (BCM) vis-a-vis Share of Natural Gas in India’s Primary Energy Consumption (percent)

Source: India Energy Statistics 2019, MoSPI, 2019\(^5\)

additional 13,500-Km gas pipeline to achieve the national gas grid requirements.\(^{18}\)

The Government of India intends to increase the number of Compressed Natural Gas (CNG) stations in the country to 10,000 by 2030.\(^{19}\) CNG vehicles in the country may witness a ten-fold increase from 3.3 million in 2019 to 33 million in 2030, according to a study conducted by Nomura Research Institute.\(^{20}\)

However, the domestic supply of natural gas is unable to keep pace with the estimated increase in demand. (See Figure 2)

To address the shortage, the government
has established new Liquefied Natural Gas (LNG) terminals in the country. At present there are four such terminals in the country, with a combined capacity of 27.5 million metric tonnes per annum (MMTPA). The government aims to raise the annual capacity of LNG terminals to 70 million tonnes.

To be sure, domestic production has plateaued in the last few years (See Figure 3), and the government is planning to increase imports of natural gas.

Over the years, India has made adjustments in its strategy to achieve stability in oil imports. From the Gulf to the Arabian Peninsula, India’s sources have been gradually expanding to include countries from Africa and Latin America. India must work towards replicating the success it has achieved in oil import sources diversification in the natural gas segment as well. In the early 1990s and 2000s, India was involved in multi-lateral negotiations for building natural gas pipelines from Iran, Turkmenistan and Myanmar. However, these pipeline projects failed to make headway owing to various factors such as fluctuating geopolitical events, differing positions on gas pricing, and changing nature of bilateral relations among countries involved in the project.

Today India sources substantial amounts of its natural gas imports from Qatar, with whom it has a long-term agreement. India has also been purchasing natural gas from the spot markets.

This brief analyses India’s energy and political engagement with some of the more prominent natural gas producers and consumers and discusses whether there is a case for India to further diversify its gas

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**Figure 2**


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Figure 3

Natural Gas Production & Net Imports in India

Source: India Energy Statistics 2019, MoSPI, 2019

imports.

INDIA’S ENGAGEMENT WITH GLOBAL GAS PRODUCERS: AN EVALUATION

Qatar

India is laying the foundations for the trade of natural gas with various players in the gas markets, both well-established\(^3\) and emerging.

The current gas market is dominated by countries such as the United States, Qatar, Russia and Australia.\(^{31, 32}\) Recently, new gas production centres have begun to emerge in Africa, Middle-East, Southeast Asia, and the Gulf. India must make use of these multiple gas production centres and ensure a balanced geographical portfolio of imports to ensure a robust and secure natural gas strategy.

This means, for one, that India should continue its engagement with Qatar, a well-established energy power in the Gulf. Following its exit from the Organisation of Petroleum Exporting Countries (OPEC) in 2019,\(^33\) Qatar announced its intention to concentrate exclusively on the development of natural gas.\(^34\) Qatar is planning to increase its LNG production capacity by about 43 percent from 77 million tonnes\(^35\) a year to 110 million tonnes by 2024. From the perspective of reliability, Qatar is eager to prove itself as a credible market player in the LNG business. For instance, despite facing a blockade from Saudi Arabia, Qatar has continued to supply natural gas to different markets.\(^36\) It has also continued supplying natural gas to the UAE despite ongoing political tensions.\(^37\) From the perspective of energy security, this behaviour by Qatar increases confidence amongst consumer countries like...
India. It would do well for India to increase the volumes of its LNG imports from Qatar at a later date.\(^{38}\)

**Russia**

Russia has maintained its decades-old energy trade ties with different regions in the world. Recognising Russia’s reputation in the global gas markets, India is taking incremental steps in expanding the scope of energy cooperation with the country. India has already begun to source LNG from Russia as per a 20-year agreement under which India will import 2.5 million tonnes of LNG from Russia.\(^{39}\) India has also demonstrated its intention to pursue investments in Russia’s Far East region.\(^{40}\) Moreover, the joint statement issued by India and Russia during Prime Minister Narendra Modi’s visit in 2019 on the sidelines of the 20\(^{th}\) India-Russia Annual Summit at Vladivostok makes mention of encouraging Russian companies to participate in India’s city gas distribution sector.\(^{41}\)

While energy engagement with Russia is a welcome step, there are certain pitfalls that India must consider. For one, Russia’s dependence on China for investments in the energy sector\(^{42}\) has been increasing substantially over the last few years.\(^{43}\) India must evaluate the implications of this. From the perspective of the geopolitics of energy supply, India must remain guarded, while sourcing its LNG imports from Russia in the coming few years.

Another consideration is Russia’s move to cut off energy supply to Ukraine over political issues.\(^{44}\) Therefore, realistically, India must adopt a two-pronged approach towards Russia. One approach would be to increase its own investments in Russia’s energy sector to counter Chinese investments (and consequently, its influence). To that effect, PM Modi’s decision to pursue economic cooperation with Russia, particularly in its Far East, is a step in the right direction. This move will help Russia reduce its dependence on Chinese investments.\(^{45}\) Second, if and when EU indeed begins to shift away from Russia for its gas needs, India could step in quickly and begin sourcing any available surplus gas from Russia at competitive prices.\(^{46}\)

**The United States**

Over the past few years, the United States (US) has emerged as one of the world’s leading producers of natural gas and has expressed interest in expanding its energy ties with India in this segment.\(^{47}\) Reports suggest that the US may become the third-largest exporter of LNG by 2020, as the Trump administration makes it a cornerstone of American foreign policy.\(^{48}\) Indeed, in the past two years, the US has engaged in separate discussions on LNG trade with countries such as China, Japan, South Korea and India, which are the largest consumers of LNG in the Asian region.\(^{49}\)

India’s Gas Authority of India Ltd. (GAIL) has signed an agreement to import 3.5 MMTPA of LNG from Sabine pass terminal in Louisiana.\(^{50}\) It has also agreed to purchase 2.3 MMTPA of LNG from Dominion Energy’s cove point.\(^{51}\) India and the US have also institutionalised the dialogue process on energy issues,\(^{52}\) beginning in 2005.
when they initiated the US-India Energy Dialogue. Overall, India and the US have been expanding cooperation in the areas of defence and security, energy, and technology.

To be sure, the US has often been perceived by certain sections in the Indian strategic community as having created obstacles for India’s own plans for regional energy cooperation. For one, the Trump administration reintroduced sanctions on Iran and prevailed upon India to stop its oil imports from the country. Sanctions on Iran upset India’s proposed activities in its gas sector, especially the ongoing engagement with the Farzad-B gas field. India has, however, tolerated this to safeguard its broader economic interests. India thus needs to factor in the US’ tendency to impose sanctions against countries whose actions are perceived by the US as in contravention to its interests.

If the Indo-US energy partnership were to strengthen, America would need to give assurances to India of no interruptions in the LNG supply irrespective of differing political positions on specific multilateral and bilateral issues.

Australia

Australia is today one of the world’s most important hubs of natural gas production. Its reserves of natural gas are estimated at 30 trillion cubic feet (TCF). With exports of LNG volumes worth 55.5 million tonnes, it has recently become the top LNG exporter in the world. India needs to significantly increase its efforts in Australia’s energy sector. Given the absence of bilateral divergences on political and economic issues, Australia can become a stable source of LNG to India. Energy trade between the two countries can prove to be mutually beneficial, as India, with its prospects of becoming a gas-based economy, provides a large, stable market for Australia’s LNG exports. Moreover, sourcing LNG from Australia is relatively more efficient as the route bypasses several maritime chokepoints.

Overall, India and Australia have in the past few years found convergence on issues such as the building up of the Indo-Pacific region, and maritime cooperation. Both are also carefully watching the rise of China in the Asia-Pacific region.

These activities by China in the region have not deterred Australia from increasing its energy engagement with India, even as LNG trade between China and Australia is expected to increase. India, which has only recently begun sourcing LNG from Australia, must be watchful of China’s activities in Australia’s energy sector. There have also been reports about how Australia has not been able to cater to domestic demand since it has committed significant volumes of available gas for exports and how the electricity cost within the country has been on the rise. However, reports are now suggesting that in addition to the current levels of LNG imports from Australia, India would be open to the idea of increasing the volumes of gas imports at affordable prices.
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Other prospective suppliers

Africa, Southeast Asia, and some parts of West Asia are other regions that India companies must consider in pursuing energy exploration activities. India has initiated efforts along these lines in some of the natural gas-endowed African countries such as Mozambique. Indian companies are involved in joint development of gas resources in Mozambique’s Offshore Area 1, an offshore block where there are some 75 trillion cubic feet of recoverable reserves of natural gas. India must keep monitoring gas discoveries in other African countries too. For instance, India must consider making forays in South Africa’s newly discovered gas fields in Algeria, Libya, Egypt, and Mozambique. Egypt, for instance, is gaining prominence for its rising natural gas production and new discoveries. Furthermore, it is diversifying its exports of natural gas and expanding to countries like China, Malaysia and Japan.

Israel has begun exporting its surplus gas to Egypt; part of these exports would fill Egypt’s domestic demand, and the rest is for export to other destinations. In the coming years, India could also explore importing LNG from Israel, considering its growing bonhomie and rapport with the latter.

Other countries like Iran, Saudi Arabia and the UAE may also emerge in the future as producing hubs of natural gas. Given India’s growing economic cooperation with some of these countries in the Gulf region, it would do well for India to tap their potential as suppliers of natural gas.

Saudi Arabia is also reported to be attempting to increase the domestic consumption of natural gas. It is reported that Saudi Arabia also has 285 TCF of proven gas reserves and is expected to become a gas exporter by 2030. Meanwhile, the UAE, with which India also has friendly relations, has discovered additional gas resources which could be exported by 2024. The UAE’s nuclear power plants may fulfill substantial domestic electricity demands, freeing up additional gas reserves for exports.

The growing closeness in bilateral relations and well-established cooperation in oil between India and the UAE and Saudi Arabia could enable smooth access for Indian companies to tap into the natural gas potential of these countries. However, given the fact that some of the gas development plans are yet to mature, India could probably adopt a wait and watch strategy. In the intermediate phase, India could also consider opening informal channels of dialogue for the purpose of gas imports in the future from some of these countries.

Iran has the potential to play an important role in India’s natural gas imports. However, the re-imposition of US sanctions on Iran precludes prospects of any possible natural gas trade between the two countries. Iran’s natural gas reserves is pegged at 1191 trillion cubic feet. Recently, Iran made an announcement that it has discovered a new gas field in the Fars province with reserves estimated at 19 trillion cubic feet. The US sanctions, differences over prices and
prevailing geopolitics in the region have created obstacles for the realisation of enormous potential for gas trade despite more than a decade of sincere efforts by India and Iran. In the future, if and when sanctions are lifted, India must strive to continue its energy engagement with Iran. In the current situation, India must continue its engagement with Iran on several non-energy segments and strive toward creating goodwill to compensate for the loss in energy trade.

Given the geopolitical complexity and turbulence in the Gulf and West Asia, India would have to tread carefully to engage in fresh energy partnerships in the realm of gas with different players of the region. From the perspective of economics, broadly speaking, presence of multiple gas producers and exporters in the region presents India the opportunity to choose an economically-sound natural gas supply arrangement.

**India’s Engagement with Gas-Importing Countries**

Current trends indicate a natural gas surplus, enabling countries to import greater volumes at more affordable rates. The Indian government intends to turn India into a gas-based economy and is making investments in gas-based infrastructure such as LNG terminals and internal pipeline infrastructure. While surplus availability of gas provides a degree of comfort, Indian policymakers would need to remain aware of the emerging trends in global gas production and consumption.

As the global demand for natural gas is predicted to experience an upward surge in the coming years, at least in absolute terms, a study of the activities of prominent consumers of natural gas from the global market is essential for India. Various countries are contemplating to make a transition to a combination of renewables and natural gas given its environment-friendly characteristics. The demand would not only be driven by some of the existing prominent consumers of gas, but also by developing economies such as those in Africa and West Asia which might increase the proportion of natural gas in their primary energy mix for wide-ranging purposes and objectives. The *World Energy Outlook* report 2018 has identified an increase in natural gas demand from countries in Africa, Southeast Asia, Middle East, Asia and South Asia. In some cases, such as the EU, the report indicates that although the share of renewables will increase in its primary energy mix, the region might witness a decrease in domestic natural gas production thereby continuing its dependence on gas imports.

In anticipation of the above mentioned evolving demand for natural gas globally, it would make sense for India to strategically position itself in the global gas markets by establishing long-term energy linkages. It would serve India well to undertake a thorough review of LNG importing strategy undertaken by some prominent consuming countries, particularly its geopolitical dimensions. Studying some of the broad internal developments in the natural gas segment of these countries also presents India with indications of trends, enormity of competition to be faced, possible insights
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Figure 4

Region-wise demand for natural gas under New Policies Scenario (BCM)

Source: IEA World Energy Outlook, 2018

into their current and future strategy towards natural gas imports and also enable India to carve out its own gas import strategy accordingly. Although these prominent consumers may provide competition and at times even challenge some of India’s bids in gas fields in prospective gas producing regions, an understanding of their activities can present unexplored opportunities for India.

To be sure, India has demonstrated sagacity in identifying and actively pursuing deliberations on striking long-term LNG import agreements with some prominent gas producing regions and countries. However, it would serve India’s evolving LNG import diversification strategy to take a cue from those adopted by other consumer countries such as Japan, South Korea and even China. A review of the sources of natural gas suppliers to the above-mentioned countries shows that these three countries have sourced LNG from geographically diverse countries, thereby minimising political risks. For example, the volumes of LNG imports of Japan, South Korea and China emanate from the Middle East, Gulf, Southeast Asia, Northeast Asia, Asia-Pacific, North America, and off-late, from Africa too. Countries such as the United States, Qatar, Russia, Indonesia, Malaysia, and Australia are some of the most prominent suppliers of LNG to Japan, South Korea and China. In the case of China, it has consciously cultivated diplomatic relations with countries in its neighbourhood to procure huge volumes of natural gas, either in piped form or as LNG. For instance, it has leveraged its geographical proximity with Russia, Central Asian countries and Myanmar in Southeast Asia, while maintaining a substantial presence in the energy sector of Africa, the Gulf and the Asia-Pacific region. Turkmenistan supplies about 30-40 BCM of natural gas every year to China, with the provision to export additional volumes. Similarly, China also secured the natural gas deal for the Shwe gas fields and built the bilateral China-Myanmar gas
pipeline in 2013.  

Another common thread among all the three consumer countries has been the fact that each of them has managed to pursue long-term strategic investment in development of gas fields in prominent gas producing regions or have signed long-term gas agreements. Further, these countries have undertaken co-investments in strategic gas fields in emerging gas producing countries. These arrangements enable cooperation on transportation, tactical and operational adjustments in pursuing gas trade. For instance, South Korea has also co-invested along with PetroChina and Royal Dutch Shell in an LNG production facility on the western coast of Canada and is expected to draw LNG from this facility for 40 years from 2024. Japanese and Korean companies have also come to an understanding on co-investing in Canada’s energy assets. Similarly, China has loaned nearly USD 8 billion to Turkmenistan for the development of the natural gas sector.

India must consider drawing lessons on two fronts from these consumer countries. To begin with, India must leverage its growing bilateral relations with countries such as South Korea, Japan and China to establish strategic energy linkages with them. Indeed, the bilateral relations between India and countries such as South Korea and Japan have been elevated to the status of a special strategic partnership. If actively pursued, these linkages could enable tactical, operational and strategic cooperation in natural gas import strategies. For instance, India must consider partnering with South Korea, Japan and China in jointly bidding for possible tenders for upstream activities and thereby take advantage of their technological prowess, financial capacity and rich experience of engaging with different natural gas producing regions. Greater coordination would also strengthen India’s bilateral relations, which, especially in the realm of trade and investments, have been improving substantially over the years with these countries.

Some of the existing platforms of cooperation with these countries can provide the basis for bilateral energy development and trade activities. In the mid-2000s, Indian companies were jointly involved in exploration and drilling activities with Korean and Chinese companies in the A-1 and A-3 blocks in Shwe gas fields, offshore oil and gas fields in Myanmar. In addition to such strategic tie-ups, India must also monitor evolving developments in Japan and South Korea. For instance, reports have indicated that Japan is reactivating some of its nuclear plants, thereby lowering domestic demand for LNG. Power generated through gas-fired power plants in Japan is expected to decline in 2019 and would be gradually replaced by nuclear power. For the global gas markets and for India’s gas import plans, the gradual reduction of gas consumption in Japan could present opportunities for India to replace Japan in the export profile of gas producing countries where the latter has a presence. During Minister of Petroleum and Natural Gas Shri Dharmendra Pradhan’s visit to Tokyo on the sidelines of the producers-consumers conference in 2017, India and Japan agreed on exploring cooperation in the LNG segment.
In his paper, Keun Wook Paik has interestingly documented the existing nature of operational cooperation between Korea, Japan and China, especially for LNG swaps. In fact, it has been reported that in the past there have indeed been deliberations for such kind of a forum between India, Japan, South Korea, China and Taiwan as a result of high LNG prices. India and China are also reportedly contemplating Joint Working Groups for deliberating on issues of cooperation in the LNG segment.

**CONTOURS OF INDIA’S FUTURE GAS DIPLOMACY**

It is expected that world demand for LNG will surpass supply in the next decade. As various developing countries make attempts to catch up with the sustainability dimensions of development and modernisation, the competition to secure natural gas supplies among consumer countries would increase.

India must tap into exporting countries at this juncture and sign additional long-term LNG agreements in order to take advantage of the market situation. New production centres spanning across different regions need investments for the conduct of exploration and drilling activities as well as the setting up of liquefaction infrastructure. India must not shy away from making forays into these countries.

India’s natural gas import strategy must engage with West Asia, Russia, Australia, the US, Africa, emerging hubs in the eastern Mediterranean and Southeast Asia. Additionally, India must continue to explore possibilities of gas transportation through pipelines from Central Asia via the Iranian port of Chabahar when the geopolitical situation provides an enabling environment.

As India’s dependence on sourcing LNG from abroad is expected to increase substantially, India must invest in building its naval capabilities and strategy to protect these LNG imports.

The current swap deal performed by Indian companies to offload surplus LNG to EU countries is a wise decision. When it comes to natural gas, such back and forth exercises must be seen as good learning experience providing Indian companies with an opportunity to familiarise themselves with the segment.

The Indian government’s intent of incorporating natural gas into India’s primary energy mix has been backed by action, including the creation of infrastructure such as pipelines and LNG terminals. It would make sense for India to continue the dialogue process amongst prominent consumers of natural gas. The country’s participation in global forums that host deliberations between major gas exporting countries and consumer countries also needs to continue.

**CONCLUSION**

By most indications, India’s current natural gas diversification strategy is sound. India has managed to track the evolving trends in the natural gas market and has begun to
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cultivate long-term energy partnerships with prominent players in the sector. From its singular reliance on Qatar, India has moved on to engage with other gas producers such as the US, Australia and Russia. India must increase its volumes of investments in the gas sector of these countries to create some degree of inter-dependence that will offset the geopolitical vulnerabilities and risks for India. Investments in Russia particularly needs to be undertaken given China’s expanding footprint in its energy space. A delay will allow China to fill the void that EU and other players may leave.

Evolving energy relations with these countries will serve India’s natural gas demand well in the coming years. However, to avoid the geopolitical pitfalls of a limited diversified import portfolio, India must engage with additional natural gas producers. With respect to natural gas cooperation with the US, India needs to be more guarded than any other country given the former’s propensity to use sanctions to effect change in the target country’s behaviour. Furthermore, when the demand for natural gas further rises in the future, India must consider increasing the volume of natural gas imports from Australia, given Australia’s cordial relations with India as well as the presence of well-endowed gas resources. In order to make India’s LNG import strategy more robust, India must further diversify by venturing into uncharted territories such as Africa, the East Mediterranean region, some parts of Southeast Asia and Asia-Pacific. Given the turbulence in the Af-Pak region and Iran, India appears to have adopted a cautious approach towards the proposals involving land pipelines from Central Asia and West Asia. However, India must remain engaged in these regions and start making inroads by familiarising itself with the existing ecosystem of energy development and trade activities.128

India must strive to overcome its own limitations such as lack of exposure to operating in uncharted territories, by remaining open to cooperation and coordination with other prominent consumers of natural gas. Strategic tie-ups with companies, consumer countries,129 and research institutions can enable India to overcome some technological challenges.130 India must also regularly monitor the evolving trends in the domestic sector of producers’ and consumers’ countries of natural gas and undertake bold investment decisions. @RF

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ENDNOTES


6. This news report quoting the Standing Committee of Parliament on Energy observes that gas fired power plants in India in the year 2017-18 are operating at PLF levels of 24 percent. For details please see – Kiran Pandey, “Lack of gas, high cost ‘stranded’ more than half of India’s gas-based power plants”, Down To Earth, 18 January 2019. Link - https://www.downtoearth.org.in/news/energy/lack-of-gas-high-cost-stranded-more-than-half-of-india-s-gas-based-power-plants-62854 (accessed on 16/August/2019)


8. Press Information Bureau, “A target of installing 175 GW of renewable energy capacity by the year 2022 has been set 100 GW of solar capacity by 2022 in the country”, 19 July 2018 (accessed on 16/August/2019)


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23. “India plans massive natural gas expansion, LNG imports to soar”, The Hindu Business Line,
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46. Vasiliy Shikin and Amit Bhandari, ‘Russia – India Energy Cooperation: Trade, Joint Projects, and New Areas’, No. 13, October 2017, Joint study by Russia International Affairs Council and Gateway House, Mumbai; Although it is true that EU may consider purchasing LNG from United States, however some reports suggest that US may find it challenging to compete with the competitive prices that Russian piped gas exports to EU. However, in future EU’s accommodativeness to USA remains quite possible. For more details please see – Holly


52. It was announced April 2018 that a US-India task force for natural gas would be created wherein US and Indian experts would be involved in coming up with suggestions for helping India in the natural gas sector for the Indian economy. For details please see – Press Information Bureau, ”India-US Strategy Energy Partnership Joint Statement”, 17 April 2018. Link - http://pib.nic.in/newsite/PrintRelease.aspx?relid=178727 (accessed on 17/August/2019)


55. Subhash Agrawal, “India and the United States: A New Partnership”, The International Spectator, Volume 46, No. 2, 57-73, 2011 (accessed on 17/August/2019); The Jaswant Singh –Strobe Talbott dialogue in the aftermath of India’s Nuclear tests in 1998 is attributed to have paved way for a broadening strategic partnership between the two countries. For details please see - Bhabani Mishra, “India-US Relations: A Paradigm Shift”, Strategic
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(accessed on 15/November/2019)


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88. Ibid.
89. Ibid.
90. Ibid.
91. Ibid.
92. Ibid.
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111. Rakesh Sinha, “Two Indian firms help China ship Myanmar gas over land”, The Indian


115. The joint statement between the leadership of two countries in the year 2016 reiterated their commitment to work on energy issues wherein cooperation on LNG markets was mentioned. For details please see – Press Information Bureau, “India-Japan Joint Statement during the visit of Prime Minister to Japan”, 11 November 2016. Link - http://pib.gov.in/newsite/PrintRelease.aspx?relid=153534 (accessed on 17/August/2019).


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