

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

**SANKET SUDHIR KULKARNI
AMEYA PIMPALKHARE**

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.

(This brief is part of ORF's series, 'Emerging Themes in Indian Foreign Policy'. Find other research in the series here: <https://www.orfonline.org/series/emerging-themes-in-indian-foreign-policy/>)

Attribution: Sanket Sudhir Kulkarni and Ameya Pimpalkhare, "India's Import Diversification Strategy for Natural Gas: An Analysis of Geopolitical Implications", *ORF Issue Brief No. 330*, December 2019, Observer Research Foundation.

Observer Research Foundation (ORF) is a public policy think tank that aims to influence the formulation of policies for building a strong and prosperous India. ORF pursues these goals by providing informed analyses and in-depth research, and organising events that serve as platforms for stimulating and productive discussions.



To know more about
ORF scan this code

INTRODUCTION

India requires a sustained supply of energy to support its ambitious growth and welfare targets for the coming years.¹ 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 2047,² of which natural gas will contribute 173 mtoe³ 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.⁴ 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.⁵ Moreover, there has been a shortage in the supply of gas for the power plants.⁶ Filling the gap with imported gas cannot be a solution, however, given the financial non-viability of gas sourced from abroad.⁷

The Government of India has set the goal of installing generation capacity of 175 Gigawatt (GW) of renewable energy by 2022.^{a, 8} 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.⁹ 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.¹⁰

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 2040.¹¹ 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 2030.¹²

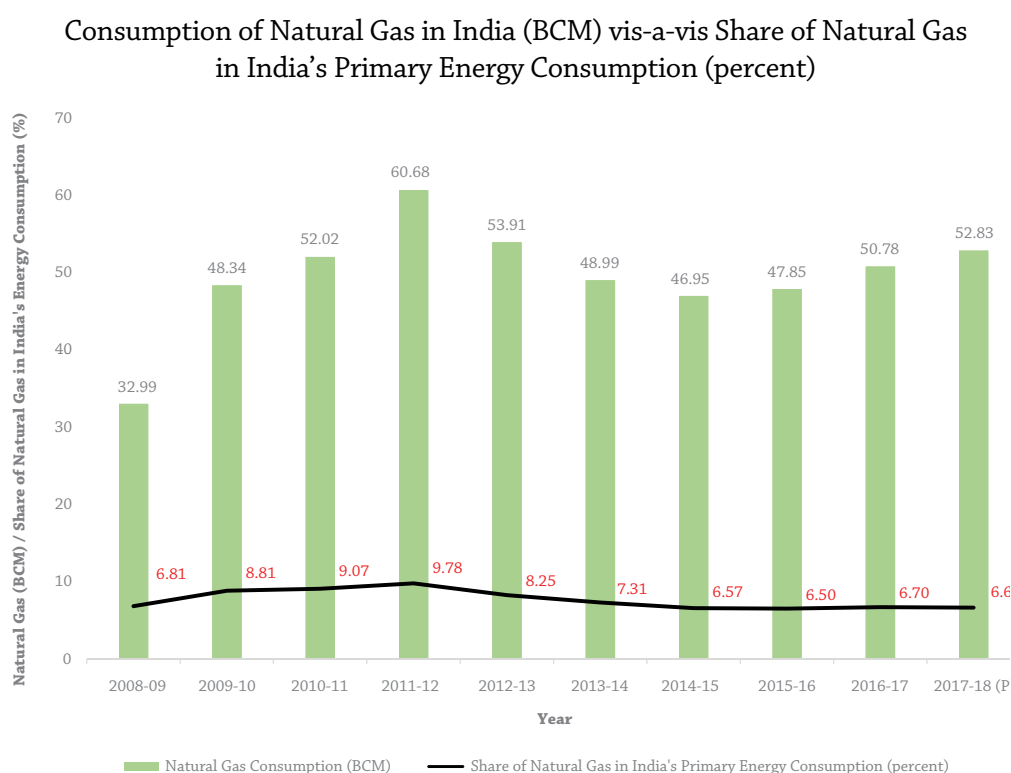
Indeed, in the past five years, the government has worked on building infrastructure for boosting the growth of natural gas in the country. It intends to increase the coverage of CGD network in the country to cover 70 percent of India's population across 50 percent of the country's geographical area.¹⁶ Investments worth US\$ 2.8 billion are being planned by the Indian Oil Corporation for gas distribution to homes, industry and transportation sector.¹⁷ The Ministry of Oil and Natural Gas in its 2018 year-end report says it is working towards constructing an

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)

	Agency	2017 (BCM)	2040 (BCM)	Share of natural gas in total primary energy demand in 2040	CAGR (2017 to 2040)
1	IEA (Scenario)				
A	Current policies	54	161	7%	4.8%
B	New policies	54	163	8%	4.8%
C	Sustainable policies	54	234	16%	6.5%
2	BP	54	185	8%	5.5%

Source: IEA World Energy Outlook 2018¹³, BP Energy Outlook 2019¹⁴

Figure 1

Source: India Energy Statistics 2019, MoSPI, 2019¹⁵

additional 13,500-Km gas pipeline to achieve the national gas grid requirements.¹⁸

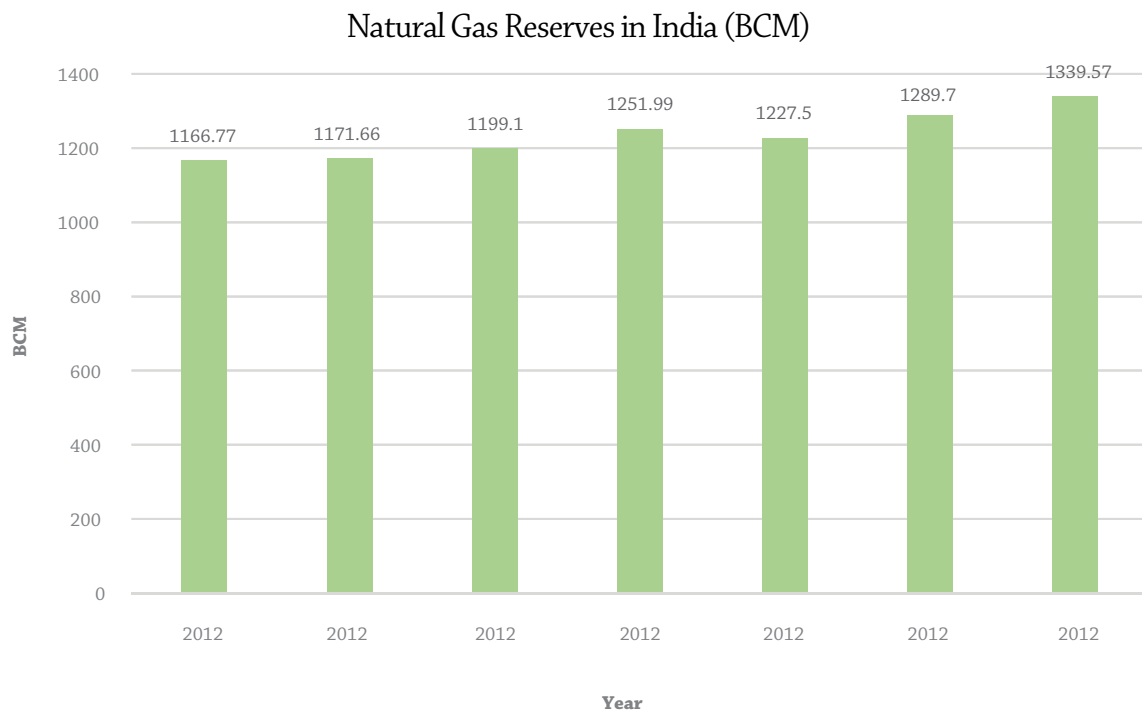
The Government of India intends to increase the number of Compressed Natural Gas (CNG) stations in the country to 10,000 by 2030.¹⁹ CNG vehicles in the country may witness a ten-fold increase from 3.3 million

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

Figure 2



Source: Open Government Platform India, 2019, <https://data.gov.in/resources/statearea-wise-balance-recoverable-reserves-crude-oil-and-natural-gas-2012-2018>

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).²² The government aims to raise the annual capacity of LNG terminals to 70 million tonnes.²³

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.

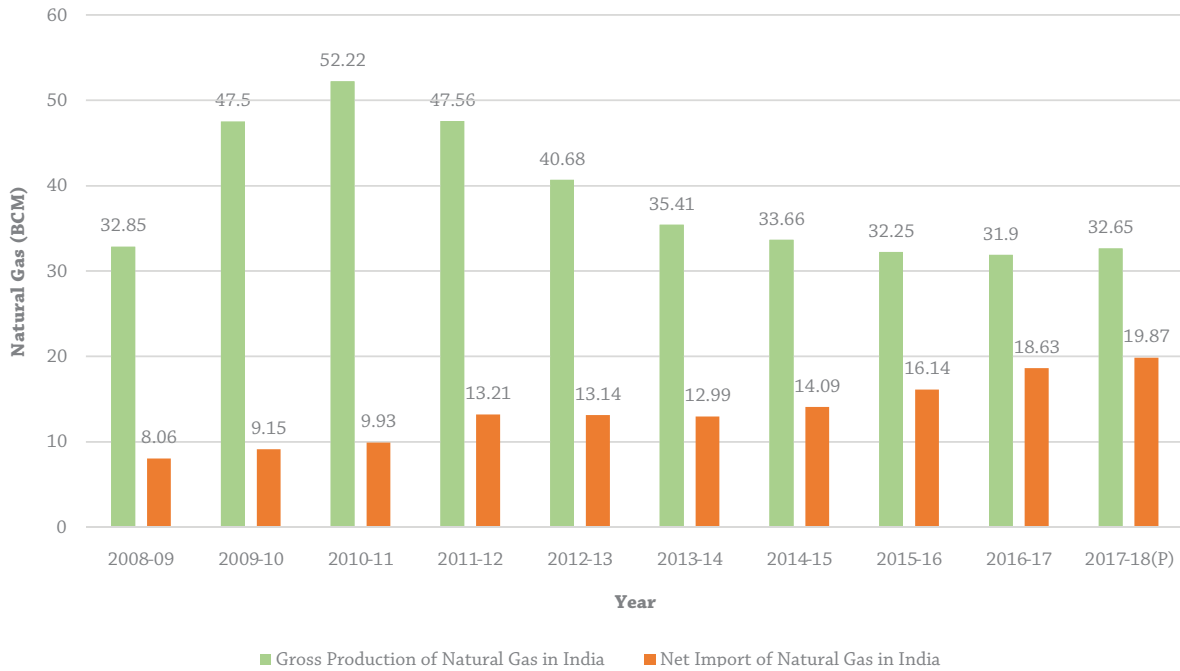
Over the years, India has made adjustments in its strategy to achieve stability in oil imports. From the Gulf to the Arabian Peninsula, India's sources have been gradually expanding to include countries from Africa and Latin America.²⁵ India must work towards replicating the success it has achieved in 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.²⁶ 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.²⁷ Today India sources substantial amounts of its natural gas imports from Qatar, with whom it has a long-term agreement.²⁸ India has also been purchasing natural gas from the spot markets.²⁹

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

Figure 3

Natural Gas Production & Net Imports in India



Source: India Energy Statistics 2019, MoSPI, 2019²⁴

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-established³⁰ 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 tonnes³⁵ 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 20th 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 sector⁴² 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.^{53, 54} Overall, India and the US have been expanding cooperation in the areas of defence and security, energy, and technology.⁵⁵

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.⁵⁶ Sanctions on Iran upset India's proposed activities in its gas sector, especially the ongoing engagement with the Farzad-B gas field.⁵⁷ India has, however, tolerated this to safeguard its broader economic interests.⁵⁸ 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.⁵⁹

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).⁶⁰ With exports of LNG volumes worth 55.5 million tonnes, it has recently become the top LNG exporter in the world.⁶¹ 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 issues⁶² 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.⁶³

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.⁶⁴ 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.⁶⁵ 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.⁶⁶

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 resources⁶⁷ in Mozambique's Offshore Area 1, an offshore block where there are some 75 trillion cubic feet of recoverable reserves of natural gas.^{68, 69}

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.⁷⁰ Furthermore, it is diversifying its exports of natural gas and expanding to countries like China, Malaysia and Japan.⁷¹

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.⁷² 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.⁷³ 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.⁷⁴ It is reported that Saudi Arabia also has 285 TCF of proven gas reserves⁷⁵ and is expected to become a gas exporter by 2030.⁷⁶ Meanwhile, the UAE, with which India also has friendly relations, has discovered additional gas resources which could be exported by 2024.⁷⁷ The UAE's nuclear power plants may fulfill substantial domestic electricity demands, freeing up additional gas reserves for exports.⁷⁸

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 sanctions⁷⁹ 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.⁸⁰ 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.⁸¹ The US sanctions, differences over prices⁸² 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 turbulence⁸³ 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,^{84, 85} enabling countries to import greater volumes at more affordable rates. The Indian government intends to turn India into a gas-based economy⁸⁶ 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.

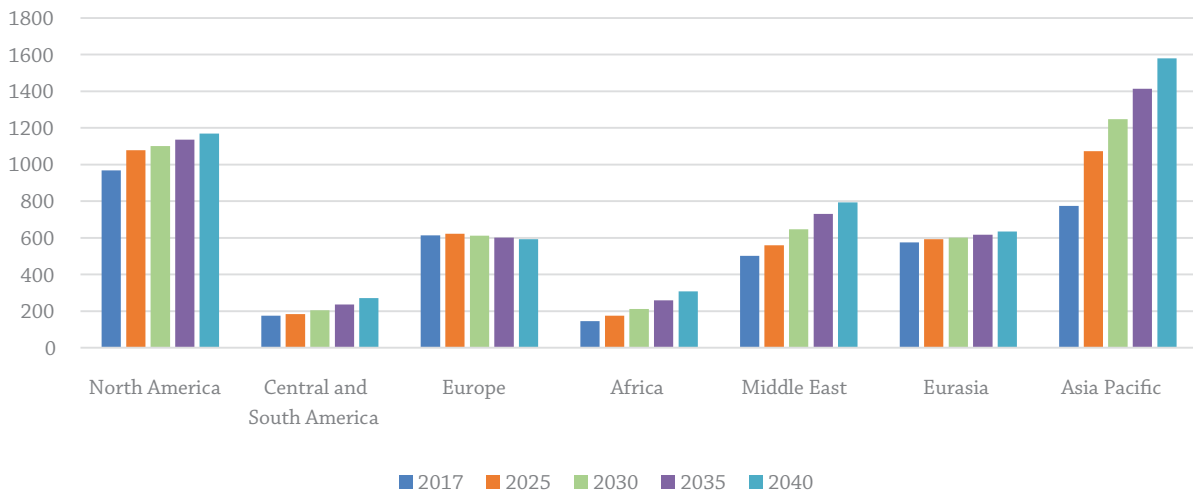
As the global demand for natural gas is

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.⁸⁷ 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.⁸⁸ The *World Energy Outlook* report 2018⁸⁹ has identified an increase in natural gas demand from countries in Africa, Southeast Asia, Middle East, Asia and South Asia.⁹⁰ 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.⁹¹

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

Figure 4

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



Source: IEA World Energy Outlook, 2018⁹²

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 those⁹³ adopted by other consumer countries such as Japan, South Korea and even China.⁹⁴ 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.^{95, 96} 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.^{97, 98} In the case of China, it has consciously cultivated diplomatic relations with countries in its neighbourhood⁹⁹ to procure huge volumes of natural gas, either in piped form or as LNG.¹⁰⁰ 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.¹⁰¹ Turkmenistan supplies about 30-40 BCM of natural gas every year to China, with the provision to export additional volumes.¹⁰² Similarly, China also secured the natural gas deal for the Shwe gas fields and built the bilateral China-Myanmar gas

pipeline in 2013.¹⁰³

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.¹⁰⁴ 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 2024.¹⁰⁵ Japanese and Korean companies have also come to an understanding on co-investing in Canada's energy assets.¹⁰⁶ Similarly, China has loaned nearly USD 8 billion to Turkmenistan for the development of the natural gas sector.¹⁰⁷

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.¹⁰⁸ 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 prowess¹⁰⁹, 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.¹¹⁰

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.¹¹¹ 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.¹¹² Power generated through gas-fired power plants in Japan is expected to decline in 2019¹¹³ and would be gradually replaced by nuclear power¹¹⁴. 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.¹¹⁵ 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.¹¹⁶

In his paper, Keun Wook Paik has interestingly documented the existing nature of operational cooperation between Korea, Japan and China, especially for LNG swaps.¹¹⁷ 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.¹¹⁸ India and China are also reportedly contemplating Joint Working Groups for deliberating on issues of cooperation in the LNG segment.¹¹⁹

CONTOURS OF INDIA'S FUTURE GAS DIPLOMACY

It is expected that world demand¹²⁰ 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.^{121, 122}

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 pipelines¹²³ 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.¹²⁴

The current swap deal performed by Indian companies to offload surplus LNG to EU countries is a wise decision.¹²⁵ 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 forums¹²⁶ that host deliberations between major gas exporting countries and consumer countries also needs to continue.¹²⁷


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

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. 

ABOUT THE AUTHOR

Sanket Sudhir Kulkarni is a Fellow, and **Ameya Pimpalkhare** is an Associate Fellow at ORF, Mumbai.

ENDNOTES

1. "India's growing energy sector is attractive for foreign investors, says Shri Dharmendra Pradhan All forms of transportation, which are clean and affordable, will be considered in our Energy Policy", Press Information Bureau, 02 August 2019. Link - <https://pib.gov.in/newsite/PrintRelease.aspx?relid=192447> (30/November/2019) ; Sanket Sudhir Kulkarni and Hippu Salk Kristle Nathan, "The Elephant and the Tiger: Energy Security, Geopolitics, and National Strategy in China and India's Cross Border Gas Pipelines", *Energy Research and Social Science*, Volume 11, (January 2016) : 183-194.
2. "India Energy Security Scenario", NITI Aayog, Government of India. Link - http://iess2047.gov.in/pathways/222022222222222022222222012222202222222222222222022202222222/primary_energy_chart (accessed on 16/August/2019)
3. "India Energy Security Scenario", NITI Aayog, Government of India. Link - http://iess2047.gov.in/pathways/222022222222222022222222012222202222222222222222022202222222/primary_energy_chart (accessed on 16/August/2019)
4. "About Natural Gas", Ministry of Petroleum and Natural Gas, Government of India. Link - <http://petroleum.nic.in/natural-gas/about-natural-gas> (Accessed on 01 December 2019).
5. Sunjoy Joshi and Lydia Powell, "India: Energy Geo-Politics", ORF Occasional Paper, No. 173, Observer Research Foundation, October 2018. Link - https://www.orfonline.org/wpcontent/uploads/2018/10/ORF_OccasionalPaper_173_Energy.pdf (accessed on 12/June/2019)
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)
7. 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)
9. Anindya Upadhyay, "India to test gas-power plants as 'peakers' to smooth power grid", *The Economic Times*, 16 August 2018. Link - <https://economictimes.indiatimes.com/industry/energy/power/india-to-test-gas-fired-plants-as-peakers-to-smooth-power-grid/articleshow/65418482.cms?from=mdr> (accessed on 16/August/2019)
10. Tim Boersma, Akos Losz, and Astha Ummat, "The Future of Natural Gas in India: A Country at a Crossroads", Columbia Center on Global Energy Policy, April 2017. Link - <https://energypolicy.columbia.edu/sites/default/files/The%20Future%20of%20Natural%20>

Gas%20in%20India%20-%20A%20Country%20at%20a%20Crossroads%200417.pdf

11. "Draft National Energy Policy", NITI Aayog, Government of India, Version of the report available on 27 June 2017. Link - "[https://niti.gov.in/writereaddata/files/new_initiatives/NEP-ID_27.06.2017.pdf\(04](https://niti.gov.in/writereaddata/files/new_initiatives/NEP-ID_27.06.2017.pdf(04)" https://niti.gov.in/writereaddata/files/new_initiatives/NEP-ID_27.06.2017.pdf (04 December 2019).
12. Shine Jacob, "Clean fuel race: CNG may turn out to be key to India's automobile future", *Business Standard*, 29 July 2019. Link - https://www.business-standard.com/article/economy-policy/clean-fuel-race-cng-may-turn-out-to-be-key-to-india-s-automobile-future-119072901696_1.html (accessed on 16/August/2019); "Text of Speech of Minister of Petroleum and Natural Gas Shri Dharmendra Pradhan at the Plenary Session of 7th Asian Ministerial Energy Roundtable in Bangkok", Press Information Bureau, 02 November 2017. Link - <https://pib.gov.in/newsite/PrintRelease.aspx?relid=173167> (accessed on 04 December 2019).
13. "World Energy Outlook", International Energy Agency, 2018.
14. "BP Statistical Review of World Energy, 2019", 68th Edition, British Petroleum.
15. "India Energy Statistics 2019", Ministry of Statistics and Programme Implementation, Government of India. Link - http://www.mospi.gov.in/sites/default/files/publication_reports/Energy%20Statistics%202019-finall.pdf (accessed on 01 December 2019)
16. *Press Information Bureau*, "Year End Report 2018- Ministry of Petroleum & Natural Gas", 12 December 2018. Link - <http://pib.gov.in/newsite/PrintRelease.aspx?relid=186260> (accessed on 16/August/2019)
17. Ashish Gupta, "LNG: It's light, natural and green", *Fortune India*, 04 March 2019. Link - <https://www.fortuneindia.com/macro/its-light-natural-and-green/103020>
18. "Year End Report 2018- Ministry of Petroleum & Natural Gas", *Press Information Bureau*, 12 December 2018, Link - <https://pib.gov.in/newsite/PrintRelease.aspx?relid=186260>
19. *Press Information Bureau*, "Shri Dharmendra Pradhan emphasizes on a clean, efficient and affordable mobility system", 08 September 2018. Link - <http://pib.gov.in/PressReleaseDetail.aspx?PRID=1545406> (accessed on 16/August/2019)
20. Prerna Lidhoo, "Natural gas vehicles to account for 50percent of total new sales by 2030: Nomura", *Fortune India*, 10 May 2019. Link - <https://www.fortuneindia.com/venture/natural-gas-vehicles-to-account-for-50-of-total-sales-by-2030-nomura/103201> (accessed on 16/August/2019)
21. "India Energy Statistics 2019", Ministry of Statistics and Programme Implementation, Government of India. Link - http://www.mospi.gov.in/sites/default/files/publication_reports/Energy%20Statistics%202019-finall.pdf (accessed on 01 December 2019)
22. *Press Information Bureau*, "Import of Natural Gas", 23 July 2018, Link - <http://pib.gov.in/PressReleaseIframePage.aspx?PRID=1539715> (accessed on 16/June/2019)
23. "India plans massive natural gas expansion, LNG imports to soar", *The Hindu Business Line*,

- 07 February 2018. Link - <https://www.thehindubusinessline.com/markets/commodities/india-plans-massive-natural-gas-expansion-lng-imports-to-soar/article22676205.ece> (accessed on 16/August/2019)
24. "India Energy Statistics 2019", Ministry of Statistics and Programme Implementation, Government of India. Link - http://www.mospi.gov.in/sites/default/files/publication_reports/Energy%20Statistics%202019-final.pdf (accessed on 01 December 2019).
 25. Sunjoy Joshi and Lydia Powell, "India: Energy Geo-Politics", ORF Occasional Paper, No. 173, Observer Research Foundation, October 2018. Link - https://www.orfonline.org/wpcontent/uploads/2018/10/ORF_OccasionalPaper_173_Energy.pdf (accessed on 12/June/2019)
 26. "Supply, Distribution and Marketing of Natural Gas Including CNG and LNG", Sixteenth Report of the Standing Committee of Parliament on Petroleum and Natural Gas, Lok Sabha Secretariat, New Delhi, 2007.
 27. Sanket Sudhir Kulkarni, "India's Decision-making on Cross border natural gas pipeline projects (1989-2012)", *Strategic Analysis*, Volume 40, Issue 5 (2016: 405-424).
 28. "Import of Natural Gas", *Press Information Bureau*, 23 July 2018. Link - <https://pib.gov.in/newsite/PrintRelease.aspx?relid=180889>
 29. "India may renegotiate LNG import contracts at an appropriate time : Dharmendra Pradhan", *The Economic Times*, 26 August 2019, Link - <https://economictimes.indiatimes.com/industry/energy/oil-gas/india-could-review-long-term-lng-contract-prices-dharmendra-pradhan/articleshow/70838170.cms> (01 December 2019).
 30. *Press Information Bureau*, "Import of Natural Gas", 23 July 2018, Link - <http://pib.gov.in/PressReleaseIframePage.aspx?PRID=1539715> (accessed on 16/June/2019)
 31. Shebonti Ray Dadwal, "The Geopolitics of Gas Common Problems, Disparate Strategies", Institute for Defence Studies and Analyses, Pentagon Press, New Delhi, 2017. ;
 32. Agnia Grigas, "The New Geopolitics of Natural gas", Harvard University Press, 2017.
 33. Stuart Elliot, "Feature: Stage set for GECF summit amid new gas backlash", *S & P Global*, 20 November 2019. Link - <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/112019-feature-stage-set-for-gecf-summit-amid-new-gas-backlash> (accessed on 29/November/2019).
 34. Ben Hubbard and Stanley Reed, Qatar Says It Will Leave OPEC and Focus on Natural Gas", *The New York Times*, 03 December 2018. Link - <https://www.nytimes.com/2018/12/03/world/middleeast/qatar-withdraw-opec.html> (accessed on 17/August/2019)
 35. Mohammed Sergie, "Qatar Said to See \$40 Billion Income Gain From Gas Expansion", *Bloomberg*, 26 September 2018, Link - <https://www.bloomberg.com/news/articles/2018-09-26/qatar-wants-to-get-even-bigger-in-gas-as-race-with-u-s-heats-up> (accessed on 17/August/2019)
 36. Mohammed Aly Sergie and Tsuyoshi Inajima, "Saudi-led isolation doesn't stop Qatar gas or oil exports", *Live Mint*, 05 June 2017. Link - <https://www.livemint.com/Industry/>

ulvp1ohQOmJHwLbLukW78O/Saudiled-isolation-doesnt-stop-Qatar-gas-or-oil-exports.html (accessed on 17/August/2019); “Despite blockade, Qatar to supply UAE with natural gas until 2032”, *Middle East Monitor*, 27 September 2018, Link - <https://www.middleeastmonitor.com/20180927-despite-blockade-qatar-to-supply-uae-with-natural-gas-until-2032/> (accessed on 17/August/2019)

37. “Despite blockade, Qatar to supply UAE with natural gas until 2032”, *Middle East Monitor*, 27 September 2018, Link - <https://www.middleeastmonitor.com/20180927-despite-blockade-qatar-to-supply-uae-with-natural-gas-until-2032/> (accessed on 17/August/2019)
38. “Qatar restarts development of world’s biggest gas field”, *Arab News*, 04 April 2017. Link - <http://www.arabnews.com/node/1078811/business-economy> (accessed on 17/August/2019)
39. “India gets cheapest LNG as Russia’s Gazprom begins supplies”, *Times of India*, 04 June 2018. Link - <https://timesofindia.indiatimes.com/business/india-business/india-gets-cheapest-lng-as-russias-gazprom-begins-supplies/articleshow/64450442.cms> (accessed on 22/November/2019)
40. “India - Russia Joint Statement during visit of Prime Minister to Vladivostok”, Ministry of External Affairs, India, 05 September 2019. Link - https://www.mea.gov.in/bilateral-documents.htm?dtl/31795/India__Russia_Joint_Statement_during_visit_of_Prime_Minister_to_Vladivostok (Accessed on 22/November/2019).
41. “Joint statement between India and Russia in Hydrocarbon sector for 2019-2024”, *Press Information Bureau*, 04 September 2019. Link - <https://pib.gov.in/newsite/PrintRelease.aspx?relid=193002> (Accessed on 22/November/2019).
42. James Henderson, “Russia’s gas pivot to Asia: Another false dawn or ready for lift off?”, *Oxford Energy Insights* 40, Oxford Institute of Energy Studies, November 2018.
43. “China steps up investments in Russia’s oil and gas sector”, *The Economic Times*, 04 September 2015, Link - <https://economictimes.indiatimes.com/news/international/business/china-steps-up-investment-in-russias-oil-and-gas-sector/articleshow/48799410.cms?from=mdr> (Accessed on 22/November/2019)
44. Randall Newnham, “Oil, carrots, and sticks: Russia’s energy resources as a foreign policy tool”, *Journal of Eurasian Studies*, Volume 2, Issue 2 (2011) : 134-143.
45. Holly Ellyatt, “Business leaders hail Russia’s booming energy ties with China”, *CNBC*, 29 November 2018. Link - <https://www.cnn.com/2018/11/29/business-leaders-hail-russias-booming-energy-ties-with-china.html>, (accessed on 22/November/2018).
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

- Ellyat, "Europe is fast-becoming a natural gas battleground for Russia and the US", *CNBC*, 08 January 2019. Link - <https://www.cnbc.com/2019/01/08/russia-and-the-us-battling-over-europes-gas-market.html> (accessed on 17/August/2019)
47. Shebonti Ray Dadwal, "The Geopolitics of Gas Common Problems, Disparate Strategies", Institute for Defence Studies and Analyses, Pentagon Press, New Delhi, 2017.
48. Agnia Grigas, 'Commentary: A win for Trump's gas diplomacy', *Reuters*, 31 August 2017. Link - <https://www.reuters.com/article/us-grigas-lng/commentary-a-win-for-trumps-gas-diplomacy-idUSKCN1BB01K> (accessed on 17/ August /2019); "The Financial Times Reports on President Trump's LNG Export Push", White House, 22 June 2017. Link - <https://www.whitehouse.gov/briefings-statements/financial-times-reports-president-trumps-lng-export-push/> (accessed on 17/08/2019); Nikos Tsafos, 'A Global Gas Strategy for the United States', CSIS, May 09, 2019, Center for Strategic and International Studies (accessed on 17/ August/2019).
49. Agnia Grigas, 'Commentary: A win for Trump's gas diplomacy', *Reuters*, 31 August 2017. Link - <https://www.reuters.com/article/us-grigas-lng/commentary-a-win-for-trumps-gas-diplomacy-idUSKCN1BB01K> (accessed on 17/August/2019)
50. "India gets its first US LNG shipment at Dabhol", *The Economic Times*, 30 March 2018. Link - <https://economictimes.indiatimes.com/industry/energy/oil-gas/india-gets-first-us-lng-shipment-at-dabhol/articleshow/63547215.cms?from=mdr> (accessed on 19/ November/2019)
51. Nidhi Verma, "India's GAIL signs 1st time-swap deal for U.S. LNG with Gunvor", *Reuters*, 03 March 2017. Link - <https://www.reuters.com/article/india-gail-gunvor/indias-gail-signs-1st-time-swap-deal-for-u-s-lng-with-gunvor-idUSL3N1GF2ZW> (accessed on 19/ November /2019)
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)
53. Ministry of External Affairs, "India-U.S. Energy Dialogue Meeting", 11 March 2014. Link - <https://www.mea.gov.in/press-releases.htm?dtlpercent2F23055percent2FIndiaUS+Energy+Dialogue+Meeting> (accessed on 17/August/2019)
54. *Press Information Bureau*, "India-US Strategy Energy Partnership Joint Statement", 17 April 2018. Link - <https://pib.gov.in/newsite/PrintRelease.aspx?relid=178727> (accessed on 18/ 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*

Analysis, Volume 29, No. 1 (2005) : 79-100 (accessed on 17/August/2019).

56. "US deadline ends, India stops purchasing Iranian oil", *The Economic Times*, 24 May 2019. Link - <https://economictimes.indiatimes.com/industry/energy/oil-gas/us-deadline-ends-india-stops-purchasing-iranian-oil/articleshow/69475495.cms?from=mdr> (accessed on 20/August/2019)
57. Shine Jacob, "ONGC arm delays plan to invest in Iran gas field after US sanctions". *Business Standard*, 24 April 2019. Link - https://www.business-standard.com/article/companies/ongc-arm-delays-plan-to-invest-in-iran-gas-field-after-us-sanctions-119042401383_1.html (accessed on 20/August/2019)
58. Shine Jacob, "ONGC arm delays plan to invest in Iran gas field after US sanctions". *Business Standard*, 24 April 2019. Link - https://www.business-standard.com/article/companies/ongc-arm-delays-plan-to-invest-in-iran-gas-field-after-us-sanctions-119042401383_1.html (accessed on 20/August/2019)
59. Jaskaran Teja, "United States–India: Enhancing a Strategic Partnership", *American Foreign Policy Interests: The Journal of the National Committee on American Foreign Policy*, Volume 36, No. 3 (2014) : 183-194 (accessed on 20/August/2019).
60. US Energy Information Administration, "Country Analysis Brief : Australia ", 07 March 2017. Link - <https://www.eia.gov/beta/international/analysis.php?iso=AUS> (accessed on 20/August/2019)
61. Jessica Jagannathan, "Australia grabs world's biggest LNG exporter crown from Qatar in Nov", *Reuters*, 10 December 2018. Link - <https://www.reuters.com/article/us-australia-qatar-lng/australia-grabs-worlds-biggest-lng-exporter-crown-from-qatar-in-nov-idUSKBN1O907N> (accessed on 20/August/2019)
62. Fredreic Grare, "The India-Australia Strategic Relationship Defining Realistic Expectations", *Carnegie Endowment for International Peace*, March 2014 (accessed on 20/August/2019)
63. Remarks by Australia's envoy to India on India Australia Maritime cooperation makes it explicitly clear about increasing cooperation among the two sides, For more details, please see - Dipanjan Roy Chaudhury, "Australia moots logistics support agreement with India to widen defence partnership in Indo-Pacific partnership", *The Economic Times*, 12 June 2019. Link - <https://economictimes.indiatimes.com/news/defence/australia-moots-logistics-support-agreement-with-india-to-widen-defence-partnership-in-indo-pacific-region/articleshow/69758255.cms?from=mdr> (accessed on 20/August/2019); Fredreic Grare, "The India-Australia Strategic Relationship Defining Realistic Expectations", *Carnegie Endowment for International Peace*, March 2014 (accessed on 20/August/2019)
64. Michael Smith, "Australia cannot take China's LNG demand for granted", *Financial Review*, 08 April 2019. Link - <https://www.afr.com/companies/energy/australia-cannot-take-china-s-lng-demand-for-granted-20190405-p51b54> (accessed on 20/August/2019)
65. Daniel Ziffer, "Gas exports blamed for soaring electricity prices and job losses", *ABC*, 17 May 2019. Link - <https://www.abc.net.au/news/2019-05-17/gas-exports-blamed-for-electricity->

price-rises-job-losses/11121120 (accessed on 20/August/2019)

66. "India keen to import more LNG from Australia but keen on affordable pricing : Dharmendra Pradhan", *The Economic Times*, 28 August 2019. Link - <https://economictimes.indiatimes.com/industry/energy/oil-gas/india-keen-to-import-more-lng-from-australia-but-wants-affordable-pricing-dharmendra-pradhan/articleshow/70878848.cms?from=mdr> (Accessed on 30/November/2019).
67. "India, Mozambique agree to develop Rovuma gas field", *Livemint*, 18 October 2017. Link - <https://www.livemint.com/Industry/fSumllnwi1pCdZLQ78ZdTL/India-Mozambique-agree-to-develop-Rovuma-gas-field.html> (Accessed on 01 December 2019).
68. Promit Mukherjee, "BPCL partner pegs final gas resources in Mozambique field at 75 tcf", *Livemint*, 06 March 2015. Link - <https://www.livemint.com/Companies/rW5eq0grfrmAumT6Vu9ehN/BPCL-partner-pegs-final-gas-resources-in-Mozambique-field-at.html> (Accessed on 01 December 2019).
69. "Mozambique Offshore Area 1 Project", *Offshore-Technology*, 19 September 2019. Link - <https://www.offshore-technology.com/projects/mozambique-offshore-area-1-project/> (accessed on 20/September/2019)
70. Khaled Kesseba and Konstantinos Lagos, 'Five countries in the eastern Mediterranean are shaking up Europe's energy map', *The Conversation*, 18 July 2019, Link - <http://theconversation.com/five-countries-in-the-eastern-mediterranean-are-shaking-up-europes-energy-map-119619> (accessed on 20/August/2019)
71. Khalid Siddiga, Harald Grethea, Noura Abdelwahab, 'The natural gas sector in post-revolution Egypt', *Journal of Policy modelling*, 2016 (1-13); CAPMAS, 'Destinations of Egypt's Exports of Natural Gas in 2014', Central Agency for Mobilization and Statistics, 2015. (cited in Khalid Siddiga, Harald Grethea, Noura Abdelwahab, 'The natural gas sector in post revolution Egypt', *Journal of Policy modelling*, 2016 : 1-13).
72. 'Israel will start exporting natural gas to Egypt this year', *Al Jazeera*, 26 July 2019, Link - <https://www.aljazeera.com/ajimpact/israel-start-exporting-natural-gas-egypt-year-190725190359567.html> (accessed on 20/August/2019)
73. Jude Clemente, "Saudi Arabia Ventures Into U.S. Natural Gas", *Forbes*, 22 January 2019. Link - <https://www.forbes.com/sites/judeclemente/2019/01/22/saudi-arabia-ventures-into-u-s-natural-gas/#685e8b2c50a1> (accessed on 15/November/2019);
74. David Fickling, "Saudi Arabia's Gas Tank Is Running Low", *Bloomberg*, 02 April 2019. Link - <https://www.bloomberg.com/opinion/articles/2019-04-02/saudi-arabia-s-gas-tank-is-running-low> (accessed on 01 December 2019).
75. Jude Clemente, "Saudi Arabia Ventures Into U.S. Natural Gas", *Forbes*, 22 January 2019. Link - <https://www.forbes.com/sites/judeclemente/2019/01/22/saudi-arabia-ventures-into-u-s-natural-gas/#685e8b2c50a1> ; Jennifer Gnana, "Abu Dhabi could develop significant LNG export capacity by 2024", 05 November 2018. Link - <https://www.thenational.ae/business/energy/abu-dhabi-could-develop-significant-lng-export-capacity-by-2024-1.788309>

(accessed on 15/November/2019)

76. Tsvetana Parakova, "Saudi Arabia Aims To Become Large Natural Gas Exporter", 26 February 2019. Link - <https://oilprice.com/Energy/Natural-Gas/Saudi-Arabia-Aims-To-Become-Large-Natural-Gas-Exporter.html> (accessed on 15/November/2019)
77. Jennifer Gnana, "Abu Dhabi could develop significant LNG export capacity by 2024", *The National*, 05 November 2018. Link - <https://www.thenational.ae/business/energy/abu-dhabi-could-develop-significant-lng-export-capacity-by-2024-1.788309> (accessed on 15/November/2019)
78. Jareer Elass, "Abu Dhabi's plans to become a natural gas net exporter", *The Arab Weekly*, 25 November 2018. Link - <https://thearabweekly.com/abu-dhabis-plans-become-natural-gas-net-exporter> (accessed on 04 December 2019)
79. Edward Chow, Cyrus Ashayeri and Andrew J. Stanley, "The Future of Iran's Oil and Gas Industry", United States Association for Energy Economics Working Paper no. 18-364, 23 October 2018. Link - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3269898## (14/November/2019)
80. 'Iran : Executive summary', 07 January 2019. Link -BP <https://www.eia.gov/beta/international/analysis.php?iso=IRN> (14/November/2019)
81. 'Iran reports new natural gas field with 19 tcf reserve in Fars province', *Reuters*, 13 October 2019. Link - <https://www.reuters.com/article/us-iran-gas-discovery/iran-reports-new-natural-gas-field-with-19-tcf-reserve-in-fars-province-idUSKBN1WS07B> (accessed on 18 November 2019)
82. Anoop Singh, "The Economics of Iran-Pakistan-India Natural Gas Pipeline", *Economic & Political Weekly*, 13 September 2008.
83. Rory Miller, "The Gulf crisis: How it all started", *Al Jazeera*, 01 June 2018. Link - <https://www.aljazeera.com/indepth/opinion/gulf-crisis-started-180531140250121.html> (accessed on 01 December 2019).
84. Andrew Clark, Rui Almeida and Adrian Del Maestro, "Navigating the transformation of the gas market Adapting to survive in a period of change", Pricewaterhouse Cooper, Link - <https://www.pwc.com.au/publications/energy-navigating-transformation-gas-market-jul16.html> (Accessed on 30/November/2019).
85. "Minister of Petroleum and Natural Gas & Skill Development and Entrepreneurship visits Tokyo, Japan for participation in LNG Producer-Consumer Conference 2017", Press Information bureau, 18 October 2017. Link - <https://pib.gov.in/newsite/mberel.aspx?relid=171790> (accessed on 01 December 2019).
86. "Steps being taken to make India a Gas based economy", Press Information bureau, 21 November 2016. Link - <https://pib.gov.in/newsite/PrintRelease.aspx?relid=153957> (01 December 2019).
87. "World Energy Outlook", International Energy Agency, 2018.

88. Ibid.
89. Ibid.
90. Ibid.
91. Ibid
92. Ibid.
93. Vlado Vivoda, "LNG import diversification in Asia", *Energy Strategy Reviews*, Volume 2 (2014) : 289-297. (accessed on 13/June/2019)
94. Vlado Vivoda, "Natural gas in Asia: Trade, markets and regional institutions", *Energy Policy*, Volume 74 (2014) : 80-90 (accessed on 13/June/2019)
95. "South Korea's November LNG imports rise 19.1 pct", *LNG World News*, 17 December 2018. Link - <https://www.lngworldnews.com/south-koreas-november-lng-imports-rise-19-1-pct/> (accessed on 16/August/2019) ;
96. Yonhap, "Korea's LNG imports hit new high in 2018", *Korea Herald*, 28 January 2019, Link - <http://www.koreaherald.com/view.php?ud=20190128000120> (accessed on 16/August/2019)
97. Tim Daiss, "Is The Japan LNG Buying Spree Over?", *Oil Price*, 04 April 2019. Link - <https://oilprice.com/Energy/Gas-Prices/Is-The-Japan-LNG-Buying-Spree-Over.html> (accessed on 16/August/2019)
98. Henning Gloystein and Jessica Jaganathan, "Having a gas: Australia dominates China's LNG supply", *Reuters*, 14 June 2019, Link - <https://www.reuters.com/article/us-australia-china-lng/having-a-gas-australia-dominates-chinas-lng-supply-idUSKCN1TF0GV> (accessed on 17/August/2019); Stephen O' Sullivan, "China: Growing import volumes of LNG highlight China's rising energy import dependency", *Oxford Institute of Energy Studies*, Oxford Energy Comment, June 2019, Link - <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2019/06/China-growing-import-volumes-of-LNG-highlight-ChinapercentE2percent80percent99s-rising-energy-import-dependency.pdf> (accessed on 17/August/2019); -Vlado Vivoda, "LNG import diversification in Asia", *Energy Strategy Reviews*, Volume 2 (2014) : 289-297. (accessed on 13/June/2019)
99. Sanket Sudhir Kulkarni and Hippu Salk Kristle Nathan, "The Elephant and the Tiger: Energy Security, Geopolitics, and National Strategy in China and India's Cross Border Gas Pipelines", *Energy Research and Social Science*, Volume 11, (January 2016) : 183-194;--Vlado Vivoda, "LNG import diversification in Asia", *Energy Strategy Reviews*, Volume 2 (2014) : 289-297. (accessed on 13/June/2019)
100. Agnia Grigas, "The New Geopolitics of Natural gas", Harvard University Press, 2017.
101. Vlado Vivoda, "Natural gas in Asia: Trade, markets and regional institutions", *Energy Policy*, Volume 74 (2014) : 80-90 (accessed on 09/June/2019); Sanket Sudhir Kulkarni and Hippu Salk Kristle Nathan, "The Elephant and the Tiger: Energy Security, Geopolitics, and National Strategy in China and India's Cross Border Gas Pipelines", *Energy Research and Social Science*,

Volume 11, (January 2016) : 183-194.

102. "Russia To Start Importing Gas From Turkmenistan Again Next Year, Gazprom Says", Radio Free Europe Radio Liberty, 10 October 2018. (accessed on 17/August/2019)
103. "Myanmar-China gas pipeline starts flowing", *Livemint*, 29 July 2013. Link - <https://www.livemint.com/Specials/nH84GT7cMeGDsSyAmfPWVM/MyanmarChina-gas-pipeline-starts-flowing.html> (accessed on 17/August/2019)
104. Cho Kye-wan, "South Korean public enterprises' overseas resource investments showing low rates of return", 08 October 2017. Hankyoreh, Link - http://english.hani.co.kr/arti/english_edition/e_national/813584.html (19/November/2019); Tim Daiss, "South Korea Doubles Down On Gas And Renewables", *Oil Price*, 25 August 2018. Link - <https://oilprice.com/Energy/Natural-Gas/South-Korea-Doubles-Down-On-Gas-And-Renewables.html> (19/November/2019) ; Vlado Vivoda, "LNG import diversification in Asia", *Energy Strategy Reviews*, Volume 2(2014) : 289-297. (accessed on 13/June/2019)
105. Jane Chung, "S.Korea's KOGAS to import 700,000 tonnes/yr from LNG Canada", *Reuters*, 12 October 2018, Link - <https://af.reuters.com/article/commoditiesNews/idAFL4N1WR5Z7> (accessed on 16/August/2019)
106. "Japan, South Korea challenge majors' domination of LNG supply chain", S & P Global Platts, 05 December 2011, Link - https://blogs.platts.com/2011/12/05/japan_skorea_challenges/ (accessed on 16/August/2019)
107. Abdujalil Abdurasulov, "China's growing demand for Turkmenistan's gas", *BBC*, 20 November 2014.
108. "India – Republic of Korea Bilateral Relations", Ministry of External Affairs, Link - https://mea.gov.in/Portal/ForeignRelation/Republic_of_Korea_October_2017.pdf (accessed on 16/August/2019); --"India –Japan relations", Ministry of External Affairs, December 2018, Link - https://mea.gov.in/Portal/ForeignRelation/Bilateral_brief_India-Japan_december_2018.pdf (accessed on 04 December 2019)
109. Keun Wook Paik, "South Korea's Energy Policy Change and the Implications for its LNG Imports", *Oxford Institute of Energy Studies*, OIES Paper no. 132, June 2018.
110. This idea is partly inspired from the fact that back in 2015, South Korea, Japan and China attempted cooperation in the LNG segment. For details see – Keun Wook Paik, 'South Korea's Energy Policy Change and the Implications for its LNG Imports', *Oxford Institute of Energy Studies*, OIES Paper no. 132, June 2018 ; "India – Republic of Korea Bilateral Relations", Ministry of External Affairs, Link - https://mea.gov.in/Portal/ForeignRelation/Republic_of_Korea_October_2017.pdf (accessed on 16/August/2019);--"India –Japan relations", Ministry of External Affairs, December 2018, Link - https://mea.gov.in/Portal/ForeignRelation/Bilateral_brief_India-Japan_december_2018.pdf (accessed on 04 December 2019) ; "India-China Bilateral relations", Ministry of External Affairs, Link - https://mea.gov.in/Portal/ForeignRelation/China_October_2017.pdf (accessed on 04 December 2019)
111. Rakesh Sinha, "Two Indian firms help China ship Myanmar gas over land", *The Indian*

Express, 18 September, 2014, Link - <https://indianexpress.com/article/india/india-others/two-indian-firms-help-china-ship-myanmar-gas-over-land/> (accessed on 16/August/2019)

112. *The Economic Times*, “Japan to lose top LNG importer position to China by 2022”, 23 July 2019, Link - <https://energy.economictimes.indiatimes.com/news/oil-and-gas/japan-to-lose-top-lng-importer-position-to-china-by-2022/70339976> (accessed on 16/August/2019); Shi Yun Fan and Jeffrey Moore, “Asian LNG landscape shifts as emerging markets liberalize”, S & P Global Platts, 31 July 2019, Link - <https://www.spglobal.com/en/research-insights/articles/asian-lng-landscape-shifts-as-emerging-markets-liberalize> (accessed on 16/August/2019)
113. *The Economic Times*, “Japan to lose top LNG importer position to China by 2022”, 23 July 2019, Link - <https://energy.economictimes.indiatimes.com/news/oil-and-gas/japan-to-lose-top-lng-importer-position-to-china-by-2022/70339976> (accessed on 16/August/2019); Shi Yun Fan and Jeffrey Moore, “Asian LNG landscape shifts as emerging markets liberalize”, S & P Global Platts, 31 July 2019, Link - <https://www.spglobal.com/en/research-insights/articles/asian-lng-landscape-shifts-as-emerging-markets-liberalize> (accessed on 16/August/2019)
114. Vlado Vivoda, “Natural gas in Asia: Trade, markets and regional institutions”, *Energy Policy*, Volume 74, (November 2014) : 80-90 (accessed on 13/June/2019)
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).
116. “Minister of Petroleum and Natural Gas & Skill Development and Entrepreneurship visits Tokyo, Japan for participation in LNG Producer-Consumer Conference 2017”, Press Information bureau, 18 October 2017. Link - <https://pib.gov.in/newsite/mberel.aspx?relid=171790> (accessed on 01 December 2019).
117. Keun Wook Paik, “South Korea’s Energy Policy Change and the Implications for its LNG Imports”, OIES No. 132, Oxford Institute of Energy Studies, June 2018.
118. Jane Chung, Yuka Obayashi and Oleg Vukmanovic, “UPDATE 3-World’s top LNG buyers form alliance to push for flexible contracts”, *Reuters*, 23 March 2017, Link - <https://uk.reuters.com/article/asia-lng-markets/update-1-top-asian-lng-buyers-form-alliance-to-push-for-flexible-contracts-idUKL3N1H02FJ> (accessed on 16/August/2019) ; Keun Wook Paik, ‘South Korea’s Energy Policy Change and the Implications for its LNG Imports’, Oxford Institute of Energy Studies, OIES Paper no. 132, June 2018. ; Shebonti Ray Dadwal, “The Geopolitics of Gas Common Problems, Disparate Strategies”, Institute for Defence Studies and Analyses, Pentagon Press, New Delhi, 2017. ; “India taking lead to create alliance of gas importers: Dharmendra Pradhan”, *The Economic Times*, 14 June 2016. Link - <https://m.economictimes.com/industry/energy/oil-gas/india-taking-lead-to-create-alliance-of-gas-importers-dharmendra-pradhan/articleshow/52752052.cms> (accessed on 22/November/2016).
119. Utpal Bhaskar, “India, China set to form a working group on energy”, *Live Mint*, 28 April 2019. Link - <https://www.livemint.com/news/india/india-china-set-to-form-a-working->

group-on-energy-1556472590562.html (accessed on 17/August/2019)

120. Fumi Matsumoto and Shunsuke Tabeta, 'Australia boosts LNG output to feed China's growing appetite', *Nikkei Asian Review*, 26 October 2018, Link - <https://asia.nikkei.com/Economy/Australia-boosts-LNG-output-to-feed-China-s-growing-appetite> (accessed on 20/August/2019)
121. "World Energy Outlook", International Energy Agency, 2018.
122. Tom DiChristopher, "The global boom in natural gas demand is about to slow, the International Energy Agency says", *CNBC*, 07 June 2019. (accessed on 20/August/2019)
123. TheHydrocarbonvision2025envisagedcross-borderpipelines,especiallyfromneighbourhood, for satiating India's energy security needs. For more details – "India Hydrocarbon Vision – 2025", Ministry of Petroleum and Natural Gas, Government of India, 1999. Link - <http://petroleum.nic.in/sites/default/files/vision.pdf> (accessed on 20/August/2019)
124. Gurpreet Khurana, "The Maritime Dimension of India's Energy Security, Strategic Analysis, Volume 31, 4 : 583-601.
125. "GAIL to import only half of US LNG into India", *Money Control*, 12 April 2018. Link - <https://www.moneycontrol.com/news/business/gail-to-import-only-half-of-us-lng-into-india-2547595.html> (accessed on 20/August/2019)
126. "Minister of Petroleum and Natural Gas & Skill Development and Entrepreneurship visits Tokyo, Japan for participation in LNG Producer-Consumer Conference 2017", Press Information bureau, 18 October 2017. Link - <https://pib.gov.in/newsite/mberel.aspx?relid=171790> (accessed on 01 December 2019).
127. Jane Chung, Yuka Obayashi and Oleg Vukmanovic, "UPDATE 3-World's top LNG buyers form alliance to push for flexible contracts", *Reuters*, 23 March 2017, Link - <https://uk.reuters.com/article/asia-lng-markets/update-1-top-asian-lng-buyers-form-alliance-to-push-for-flexible-contracts-idUKL3N1H02FJ> (accessed on 16/August/2019)
128. Sanket Sudhir Kulkarni, "Wait and watch: The most optimal strategy for sustaining Indo-Turkmen energy ties", Observer Research Foundation, 13 August 2019. Link – (accessed on 22/November/2019)
129. "Minister of Petroleum and Natural Gas & Skill Development and Entrepreneurship visits Tokyo, Japan for participation in LNG Producer-Consumer Conference 2017", Press Information bureau, 18 October 2017. Link - <https://pib.gov.in/newsite/mberel.aspx?relid=171790> (accessed on 01 December 2019).
130. Malancha Chakrabarty, "Indian investments in Africa: Scale, trends, and policy recommendations", Observer Research Foundation, Working Paper, 19 May 2017, Link-<https://www.orfonline.org/research/indian-investment-africa-scale-trends-and-policy-recommendations/> (accessed on 20/August/2019)



Ideas • Forums • Leadership • Impact

20, Rouse Avenue Institutional Area, New Delhi - 110 002, INDIA
Ph. : +91-11-35332000. Fax : +91-11-35332005.
E-mail: contactus@orfonline.org
Website: www.orfonline.org