Australia: The Missing Piece in India's Energy Security Puzzle

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Abstract

Over the last few decades, India's demand for natural gas has risen. Although the country's domestic production has increased, it can only meet a portion of the country's overall increasing demand. Approximately half of the country's gas supply comes from domestic production, with the remainder coming from imports from other countries. India's import ratio is rising to bridge the demand-supply gap. The country's reliance on foreign sources exposes its energy security to regional and global events. Thus, to ensure an uninterrupted supply of LNG, India needs to continuously analyse the geopolitical dynamics of the source countries, as well as come up with diversification strategies to meet its needs. This paper attempts to evaluate how India can benefit by increasing the LNG trade with Australia and how New Delhi can strengthen its stakes in the Indo-Pacific region.

Keywords: India, Australia, Liquified Natural Gas (LNG), Energy Security

Introduction

India is constantly developing, both economically and socially, which will inevitably increase demand for energy sources. Since the country has limited energy resources, imports play a crucial role in bridging the gap between the overall demand and supply. "*The government has envisaged increasing the share of natural gas in the primary energy mix of the country from the current level of 6% to 15% 2030".* [1] Presently, India has been able to fulfil about 52-53% of its requirement of natural gas by domestic production. So far, the proven reserves of natural gas have been estimated at 1371.89 billion Cubic Metres (bcm),[2] with maximum reserves on the eastern offshore, which stand at around 40%.

Figure 1 gives a pictorial representation of natural gas comprising all three types of reserves, namely the commercially recoverable resources, potentially commercially-recoverable resources, and non-commercial known deposits. To increase production in the energy sector, the government has come up with a series of initiatives, which aim to enhance domestic production, increase transparency, reduce red-tapism, and generate employment opportunities. These multiple government initiatives aim to revolutionise the energy sector through gas pricing mechanisms, policy for the extraction of coal-bed methane, 'Hydrocarbon Vision:

[1] Ministry of Petroleum & Natural Gas, "Shri Dharmendra Pradhan says India is an attractive investment destination for the energy sector", *PIB India*, 23 December 2020 https://pib.gov.in/PressReleasePage.aspx?PRID=1683101

[2] Energy Statistics India 2021, *"National Statistical Office, Ministry of Statistics and Programme Implementation"* http://www.mospi.nic.in/sites/default/files/reports_and_publication/ES/Energy%20Statistics%20India%202021.pdf

2030' for the North East,[3] reforms in the exploration and licensing policy, and better incentivising schemes. The 'Hydrocarbon Exploration and Licensing Policy' (HELP) was specifically introduced with the aim of enabling the 'Ease of Doing Business,' by providing a single license for exploration, as well as production.[4]

The majority share in natural gas production is with the state-owned companies, Oil and Natural Gas Corporation Limited (ONGC) and Oil India Limited (OIL). These public sector undertakings are still the prime bidders in the auctions and succeed in bagging a major share in the gas blocks. Though the government has made the right policy changes and is allocating the blocks, using the Open Acreage Licensing Policy (OALP) regime, it has remained largely unsuccessful in attracting foreign investment in exploration as well as production.

India is steadily increasing its gas infrastructure and has successfully constructed a pipeline network of approximately 17000 kilometres and about 15000 kilometres of pipeline has either been approved or is under construction. The Gas Authority of India Limited (GAIL), a state-owned enterprise, owns and operates more than two-thirds of the pipeline infrastructure. The GAIL is also involved in the construction of the ambitious 2655-km long '*Pradhan Mantri Urja Ganga*' in eastern India, which would connect the Jagdishpur-Haldia/Bokaro-Dhamra Gas Pipeline project.[5] The other ongoing projects aim towards developing the pipeline connectivity in the north eastern states i.e. Sikkim, Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland, Manipur, and Tripura, which is being developed by the '*Indradhanush* Gas Grid Limited' (IGGL), a joint venture company of various public sector enterprises i.e. (Gas Authority of India Limited) GAIL, (Indian Oil Corporation Limited) IOCL, (Oil India Limited) OIL, (Oil and Natural Gas Corporation) ONGC, and (Numaligarh Refinery Limited) NRL.[6]

With the majority of India's LNG terminals located on the west coast, there is a huge need for similar terminals on the eastern coast. Out of the six operational gas terminals, five are located on the western coast and only one, located in Ennore, is on the eastern coast. The overall capacity of the existing terminals stands at approximately 39 bcm. Several additional terminals, which would further enhance the capacity by 24 bcm, have been approved and are presently under development. There are other terminals as well, which are proposed on the eastern coast which would have a capacity of 10 bcm. Presently, there is a huge need for the development of LNG terminals on the eastern coast of the country. All the existing and planned infrastructure of the LNG terminals are stated in Table 1. [7]

With approximately 60% of India's LNG reserves located offshore, the road to domestic production of natural gas has never been easy. The data on the domestic production of natural gas shows a declining trend. It stood at 52.22 bcm in 2010-11 and has reduced to around 31.18

[3] Annual Report 2016-17, "*Ministry of Petroleum and Natural Gas*", http://petroleum.nic.in/sites/default/files/AR16-17.pdf

[4] Ibid

[5] Energizing India's Progress, Annual Report 2019-20, "*Ministry of Petroleum and Natural Gas*" https://mopng.gov.in/en

[6] Indradhanush Gas Grid Limited, "*Indradhanush Gas Grid Limited,*" https://iggl.co.in/

[7] India, "*Energy Information Administration,*" https://www.eia.gov/international/analysis/country/IND

bcm in 2019-20 and 28.67 bcm in 2020-21. Figure 2, clearly demonstrates the declining trend in the domestic production of natural gas. [8]

The decrease in gas production has slackened the country's endeavour to become a 'gas-based economy.' The stunted domestic production has also impacted the other energy-dependent sectors. Although the government has tried to re-energise domestic production it has not gained much success so far. Lack of foreign investment is a concern, especially when the revenues generated from the domestic market are insufficient to garner a large amount of investment. Therefore, in its bid to keep up with the rising demand, the government has substantially increased the imports of natural gas. [9]

Reliance on West Asian and African Suppliers

India is currently the fourth largest importer of natural gas in the world, with long-term deals with several countries to ensure an uninterrupted supply of LNG. Qatar, with whom India enjoys close bilateral relations, is its largest supplier of natural gas, thus proving to be a credible source of LNG over a long period. However, since last decade, the Indian buyers have diversified their import sources and have entered into a number of long-term and short-term agreements with other countries as well, including the West Asian countries, mainly Oman and United Arab Emirates (UAE), as well as the African countries like Angola, Nigeria, and Equatorial Guinea. India has also added the United States (US) and Australia to its LNG import basket. The graph below depicts the import share from each country on a time scale of ten years. [10]

Although India has rightly diversified its LNG import sources, a considerable share still comes from a specific geographical region which includes West Asia and West Africa.[11] The four largest suppliers of India's LNG demand in the region are Qatar, Nigeria, the UAE, and Angola. The geopolitical environment of both these regions can be termed extremely turbulent in terms of maritime security.

According to the International Maritime Bureau [IMB] (2019), piracy is most prevalent in the seas surrounding the West African sub-region.[12] According to the IMB, 785 piracy incidents have been reported in the area since 2000, and current models foreseeing global piracy trends have been unable to predict maritime crime with any degree of accuracy in any of the West African states. The threat of piracy and other illegal maritime activities makes West African countries unreliable energy trade partners.

Although Qatar and the UAE, India's major LNG suppliers in West Asia, are relatively more stable than their West African counterparts, the risk level of the maritime route connecting

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[8] India Energy Outlook, 2021, "*International Energy Agency*," https://www.iea.org/reports/india-energy-outlook-2021

[9] Ibid

[10] Trade Statistics, *"Department of Commerce, Ministry of Commerce and Industry, Government of India,"* https://commerce.gov.in/trade-statistics/

[11] Ibid

[12] International Maritime Bureau [IBM] (2019) Gulf of Guinea World Piracy Hotspot. https://www.icc-ccs.org/index.php/1279-seas-off-west-africa-world-s-worst-for-pirate-attacks-imb-reports

Qatar and the UAE to India has been elevated due to the chokepoint of the Strait of Hormuz, which is a narrow strategic passage between the Arabian Peninsula and Iran and connects the Persian Gulf to the Gulf of Oman.[13] This chokepoint is strategically and geopolitically significant because it is vulnerable to disruptions and blockades during a geopolitical crisis. The deteriorating relationship between Iran and the other countries in the region might add up to the existing set of problems. In case of any regional conflict between the two blocs of countries, the threat of disruption of maritime traffic passing through this chokepoint is real. [14]

Besides, over-dependence on a particular country for energy supplies can also put India's energy security in the doldrums. Thus, the best way for India to ensure an uninterrupted supply of LNG during unforeseen events is to diversify its imports. In this regard, Australia can be the missing piece in the puzzle which can solve India's energy dilemma. Brokering a deal with Australia will be beneficial for India as the maritime route between Barrow Island (Western Australia) and Chennai are almost half of the maritime route between Nigeria and Mumbai. This considerable reduction in the distance would also lower the energy bills of India to a certain extent.

Current State of India-Australia Trade

India and Australia have been trading in LNG for a long time, it was in 2009 that both countries signed their first long-term contract. The deal was inked between the state-owned Petronet LNG of India and ExxonMobil of the US for the Gorgon Project in Australia, to purchase 1.44 million tonnes of natural gas annually in a period of 20 years.[15] The signing of the deal was followed by a fall in the crude prices of natural gas in the international market, which shifted the buyers more towards spot purchasing as it was comparatively cheaper. The 2009 LNG deal between Petronet LNG and ExxonMobil was re-negotiated in 2017, wherein it was agreed that Petronet would purchase an extra million tonnes of natural gas at 13.9% of the Brent oil price. Also, the transportation cost, which was earlier borne by Petronet, would be taken care of by ExxonMobil. The deal was a breakthrough for India as it helped in saving a wealth of around Rs 4000 crore. [16]

The LNG trade between the two countries, however, has encountered numerous ups and downs and is yet to stabilise. For three years, from 2012-15, India did not import LNG from Australia. In 2017-18, however, India imported approximately 9% of its total natural gas requirement from Australia. Imports fell by 29% the following year, and by 19% in 2020-21, owing primarily to the arrival of the Covid-19 pandemic.

Australia's LNG Reserves and Related Infrastructure

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[13] Vishakh Krishnan Valiathan, Escalating Tensions in the Strait of Hormuz: India's Responses, "Centre for Land and Warfare Studies", 16 July 2019 https://www.claws.in/escalating-tensions-in-the-strait-of-hormuz-indias-responses/

[14] Ibid

[15] PA2709 Australia and India sign AUD 25 Billion Gorgon LNG Deal, "*Australian High Commission New Delhi, India, Bhutan*," https://india.embassy.gov.au/ndli/home.html

[16] After Qatar and Australia, GAIL India gets Russia to lower LNG import price, "*Business Standard*," 17 January, 2018, https://www.business-standard.com/article/pti-stories/after-qatar-and-australia-russia-lowers-lng-price-for-india-118011600893_1.html

Australia has substantial reserves of natural gas and most of these reserves are located offshore. The estimated reserves of both, the commercially viable, as well other known deposits by Geoscience Australia, are around 3228.12 bcm, which include both the coal bed methane and conventional natural gas. [17] Around 93% of conventional gas reserves are located on the northwest shelf, which is positioned offshore in the basins of Bonaparte, Carnarvon and Browse.

The reserves of coal bed methane (CBM) which has a share of 38% in the total gas reserves are primarily located in the Surat and Bowen basin of the Queensland province in the northeast region of Australia. There are other potential reserves as well, which are not proven yet, but are being studied and analysed. These potential reserves are distributed in the Maryborough, Cooper, Canning, and Perth basin, which are dispersed all across the country. [18]

The natural gas sector in Australia is regulated by the Council of Australian Governments (COAG), Energy Council and the Department of the Environment and Energy. Based on the jurisdiction, the management of natural gas exploration and production is divided between the federal and the state governments. Most of the natural gas distribution infrastructure in Australia is privately owned. Apart from domestic companies, many foreign entities have also invested in natural gas infrastructure. Major companies operating in Australia are Chevron, ExxonMobil, Apache Corporation, Shell, Total, Woodside, Santos, ConocoPhillips etc. Leading Asian companies from China and Japan, i.e., the China National Offshore Oil Corporation (CNOOC), Sinopec, the China National Petroleum Corporation (CNPC), PetroChina and Tokyo Gas have also invested in various LNG projects in Australia. The pipeline infrastructure of almost all the states, except Tasmania and Western Australia, is managed by the Australian Energy Regulator. [19]

Australia's LNG production has increased exponentially in the last two decades. There has been a spur of investments in the LNG industry, leading to a significant development in infrastructure, as well as production. The north western region of the country produces the largest share of LNG, comprising around 65% of the total annual production. The other states which significantly add up to the total LNG production are Queensland, Victoria and New South Wales (NSW). [20]

The domestic consumption of natural gas in Australia, however, has not increased at the same pace as that of its domestic production. The Australian Government has lately been formulating policies that aim to reduce carbon-dioxide emissions and has incentivised the use of cleaner fuels. The gap between domestic production and consumption, which has steadily risen over the past decade, has provided enough surplus volume to be exported. Australia has signed LNG export agreements with several countries and is exporting natural gas to countries located in the Indo-Pacific region i.e., China, Japan, South Korea, India etc. In 2020, Australia exported 106.2 bcm of LNG and became the lead LNG exporter of the world, bypassing Qatar. [21]

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[17] Australia, "*U.S. Energy Information Administration,*" https://www.eia.gov/international/analysis/country/AUS

[18] Geoscience Australia, "*Australian Government*," https://www.ga.gov.au/digital-publication/aecr2021/gas

[19] Ibid

[20] Ibid

[21] N. Sönnichsen, Liquefied natural gas: major exporting countries, 2020, "*Statista,*" https://www.statista.com/statistics/274528/major-exporting-countries-of-lng/

Australian exports are restricted to a particular region, thereby exposing them to the local geopolitical and geo-economic events of that region. Japan is the largest importer of LNG worldwide and receives the highest share of its imports from Australia (around 40%). [22] Another key consumer of Australian natural gas is China. The country's exports to China have been significantly rising since 2016. Presently, Australia is the largest trading partner of China in the LNG trade. It held a 43% share of the total LNG imports of China in 2020. South Korea is also a seasoned LNG importer of natural gas and receives its second-largest supply of LNG imports from Australia. [23]

Australia is now looking to diversify its LNG export basket and has started trading with other markets in South Asia, Southeast Asia and West Asia. However, with a surplus supply of natural gas in the Asian region and a fall in global LNG prices, it is getting increasingly difficult for Australia to sign long-term contracts with new partners in the region.

Australia is successfully working towards expanding its LNG facilities. It has invested heavily in both the greenfield, as well as the brownfield projects. It is, however, facing competition in the Asia-Pacific region, where many suppliers are also keen to expand their market in this region. Besides, west Asia, Africa, Russia, and the US also supply natural gas in this region, which provides numerous options and bargaining power to the importing enterprises. The weakening global gas demand, mainly due to the Covid-19 pandemic has also created a surplus, adversely impacting the international gas prices significantly.[24] With greater regulatory challenges, many environmental jurisdictions, and continuous investments in expansion projects, it is getting difficult for Australia to make a considerable profit.

Trade War between Australia and China

Australia's biggest trading partner is China but the South Pacific nation is also an ally of the US. With the ongoing trade war between Washington and Beijing, it is getting increasingly difficult for Canberra to secure its economic and diplomatic interests. China and Australia signed a Free-Trade Agreement (FTA) in 2015. China is also the sixth-largest investor of foreign capital in Australia. Trade between the two countries decreased in 2020 due to the Covid-19 pandemic and the trade war between the US and China. The trade restrictions led to a reduction in Australian exports to China by 6% in 2020 when compared to 2019. [25]

China has responded stringently to the trade war and has restricted many Australian products, including meat, barley, timber, cotton, and most importantly, coal. The punitive stand opted

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[22] Catharina Klein, Import volume of LNG Japan FY 2015-2020, *Statista,"* 12 July 2020, https://www.statista.com/statistics/1116964/japan-lng-import-volume/

[23] Yan Liu, Xunpeng Shi, James Laurenceson, "Dynamics of Australia's LNG export performance: A modified constant market shares analysis", *"Energy Economics",* Volume 89, 2020, 104808, ISSN 0140-9883, https://doi.org/10.1016/j.eneco.2020.104808. https://www.sciencedirect.com/science/article/pii/S0140988320301481

[24] Khalid Khan, Chi-Wei Su, Adnan Khurshid, Muhammad Umar, COVID-19 impact on multifractality of energy prices: Asymmetric multifractality analysis, *"Energy",* Volume 256, 2022, 124607, ISSN 0360-5442, https://doi.org/10.1016/j.energy.2022.124607. https://www.sciencedirect.com/science/article/pii/S0360544222015109

[25] China, "*Department of Foreign Affairs and Trade, Australian Government*," https://www.dfat.gov.au/geo/china/china-country-brief

by China has hit the Australian economy. [26] China imposed anti-dumping duties on Australian wine in 2021, with tax rates ranging from 107.1% to 212.1%.[27] With coal added to the list, experts predict that the next commodity on the restricted list would be natural gas. The Chinese restriction on the Australian LNG import would cause an escalation in the trade war, which in turn, would further escalate tension between the two trading partners.

Opportunity for India

The conflicting interests of Beijing and Canberra offer a great opportunity for India. New Delhi can fill the vacuum created by Beijing and can actively engage with Canberra on increasing the bilateral trade in commodities like coal, iron ore, and specifically natural gas. Both India and Australia have been trying hard to diversify their LNG trade baskets to tone down their extreme overdependence on a certain set of countries. In the backdrop of a trade war, both countries can increase their bilateral trade links and diversify their present trade portfolios.

Convergences between India and Australia

The bilateral relations between India and Australia which evolved over the last decade, are steadily growing into a strong partnership. Both countries are natural partners, having a shared history of colonialism and concurrent views on the rule-based order. The Indo-Pacific region has emerged as the centre of geopolitical and geo-economic activities across the world. And both India and Australia have shared interests in the geographical region of the Indo-Pacific. It provides them with an exceptional opportunity to work together in proximity.
The two countries are now closely working towards ensuring maritime security in the region and protecting the regional build-up of the Indo-Pacific region. Today, both New Delhi and Canberra are collaborating in the strategic sphere, conducting regular military exercises and professional exchanges between the defence forces. The contrasting capabilities of both nations make them naturally aligned in the security framework of the larger region. [28]

Australia has the potential to become a stable source of natural gas for India. An increase in the energy trade would benefit both countries, as it would enhance their bilateral convergence on several economic, as well as political constructs. The two countries must collaborate in energy trade and should increase cooperation in the trade of energy resources. [29] Given the convergence of the two countries towards gas-based energy sources, there is a great scope for them to bilaterally invest in gas infrastructure as well. India has already made it clear that it wants to increase its LNG imports from Australia and is looking to negotiate the pricing

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[26] An Australian Economic Strategy to 2035, "*Department of Foreign Affairs and Trade, Australian Government*," https://www.aninews.in/news/world/pacific/australia-winning-trade-war-with-china-despite-chinese-restrictions20210515214546/

[27] Fergus Hunter, Daria Impiombato, Yvonne Lau and Adam Triggs; Countering China's Coercive Diplomacy, *"Australian Strategic Policy Institute",* Policy Brief Report No. 68/2023, ISSN 2209-9689 https://ad-aspi.s3.ap-southeast-2.amazonaws.com/2023-02/Countering%20Chinas%20coercive%20diplomacy_1.pdf

[28] Dhruva Jaishankar, The Australia India Strategic Partnership: Accelerating Security Cooperation in the Indo Pacific, "*Lowy Institute," 17 September 2020,* https://www.lowyinstitute.org/publications/australia-india-strategic-partnership-security-cooperation-indo-pacific

[29] India keen to import more LNG from Australia but wants affordable pricing: Pradhan, "*Energy World*," 29 August 2019, https://energy.economictimes.indiatimes.com/news/oil-and-gas/india-keen-to-import-more-lng-from-australia-but-wants-affordable-pricing-pradhan/70885516

mechanisms. Given the fall in international LNG prices, the two countries need to come up with a strategy that addresses the issue of affordability in the long-term scenario.

'*An India Economic Strategy to 2035: Navigating from Potential to Delivery',* drafted by Mr Peter Varghese AO, former Secretary of the Department of Foreign Affairs and Trade and former Australian High Commissioner to India, has identified the LNG trade as an important pillar of the overall energy trade between the two countries. [30] The '*Australian Economic Strategy: Australia Economic Strategy: Strengthening India-Australia Comprehensive Partnership'* report drafted by CII and KPMG and led by Ambassador Anil Wadhwa, Former Secretary (East), Government of India, clearly highlights the need for bilateral investment between India and Australia in the energy sector, including natural gas.

Way Forward

Given the range of convergences between the two countries, they can work closely together and increase trade and investment in the natural gas sector. There is, however, a need for accelerated infrastructure development in India, specifically the construction of LNG terminals on the eastern coast. Presently, the LNG terminals in India enjoy limited connectivity. Although the north-western region is well connected with the LNG regasification terminals and pipeline infrastructure, the limited connectivity on the east coast has been a major hindrance in importing LNG.[31] The expanded gas grid will enhance the capacity of the transmission system and will transform it into a more reliable gas ecosystem. The Government of India has started several projects for the development of gas infrastructure, but a majority of these projects are developed by state-owned entities, mainly because of low private investment. Australian enterprises can partner with these state-owned, as well as private entities, in the development of the terminal. as well as pipeline infrastructure. India has allowed 100% Foreign Direct Investment (FDI) in the natural gas sector.

Apart from LNG infrastructure projects, Australian entities can directly invest in the exploration and production of natural gas too. The Hydrocarbon Exploration and Licensing Policy (HELP), 2016, follows the Open-Acreage Policy through which only a single license is required for both, exploration as well as production. The policy allows 100% FDI through the automatic route. The policy also ensures better taxation rules, outreach, and simpler policies and looks out for better technologies, along with increased production. In return, companies share a percentage of their profit share with the government. [32] The Indian government has been reaching out to foreign enterprises willing to invest in Indian energy production.[33] India can benefit if Australian companies, with their expertise in exploration and production, are involved in natural gas production in India.

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[30] Peter N Varghese AO, Navigating from Potential to Delivery, "*An India Economic Strategy 2035,"* https://www.dfat.gov.au/geo/india/ies/index.html#:~:text=NAVIGATING%20FROM%20POTENTIAL%20TO%20DELIVERY&text=What's%20now%20needed%20is%20a,with%20India%20out%20to%202035.

[31] Energizing India's Progress, Annual Report 2019-20, *"Ministry of Petroleum and Natural Gas"* https://mopng.gov.in/en

[32] Ibid

[33] Sanjeev Choudhary, Government to reach out to foreign players for exploration, "The Economic Times" 31 July, 2019, https://economictimes.indiatimes.com/industry/energy/oil-gas/government-to-reach-out-to-foreign-players-for-oil-exploration/articleshow/70458575.cms?from=mdr

Being the third-largest importer of natural gas in Asia, India needs to make a transition to a transparent gas market. It will require New Delhi to implement market-based reforms and rationalise taxes to attract both investors as well as producers. India will have to robustly implement the existing policies to develop a better investment environment for enterprises. With the expanding consumer base, the end-user prices will also need to be rationalised.

An investment in natural gas will also provide immense environmental benefits to the ecosystem when compared to conventional energy resources such as coal and petroleum products. The usage of natural gas will reduce carbon-dioxide emissions and release fewer air pollutants. Thus, both countries can create an ecosystem that would generate the mechanisms of better trade in natural gas.

The broadening range of the LNG sources will provide a much-required flexibility to Indian LNG imports. It is expected that LNG import would rise to around 120 bcm by 2040, around four times the current value. To secure the growing LNG imports, the government needs to widen the contracts and move towards the mixed-portfolio regime, which would allow flexibility to choose from the various available options, such as spot purchases, which entirely depend on the market forces, indexed supply, long-term fixed contracts, and other forms of inflexible purchases. Some state-owned enterprises have entered 'swap agreements' with other gas-producing companies. India needs to smartly develop its strategy to ensure the reliable flow of base-load supply, which can be ensured by signing a certain number of fixed contracts and the remaining supply can be fulfilled by spot contracts. The long-term LNG contract with Australian companies has not worked out very efficiently and therefore, a mixed regime needs to be seriously considered.

With the current data, it is possible to predict that the demand for LNG will exceed the supply.[34] Therefore India needs to ensure a sustainable supply of natural gas by sourcing its supplies from different geographical regions. India is moving in the right direction by diversifying its natural gas trade and has also taken concrete steps by reaching out to other gas-producing countries, apart from its conventional suppliers. Well-strategised energy relations with different countries will not only save India from geopolitical pitfalls but will also aid in building better ties with these nations. Australia has almost all the requisite characteristics that India can exploit to ensure an unhindered energy supply. Both countries can also cooperate in the development of superior maritime infrastructure and patrol to protect their bilateral trade. Given the set of bilateral convergences between India and Australia and the presence of plentiful resources in Australia, the increase in LNG trade will only make the Indian import more robust. The Indo-Pacific region provides a comparatively stable and risk-free environment, compared to West Asia. China has marked its footprints in the region, given its favourable geographical location and trade routes. India needs to significantly enhance its volume of trade and investment in the Indo-Pacific. which would significantly lead to the expansion of its footprints in the region.

[34] Fumi Matsumoto and Shunsuke Tabeta, Australia boosts LNG output to feed China's growing appetite, "*Nikkei Asian Review*," 26 October 2018, https://asia.nikkei.com/Economy/Australia-boosts-LNG-output-to-feed-China-s-growing-appetite

Tables and Figures

Figure 1: Distribution of Estimated Reserves of Natural Gas in India (as of March 2020)

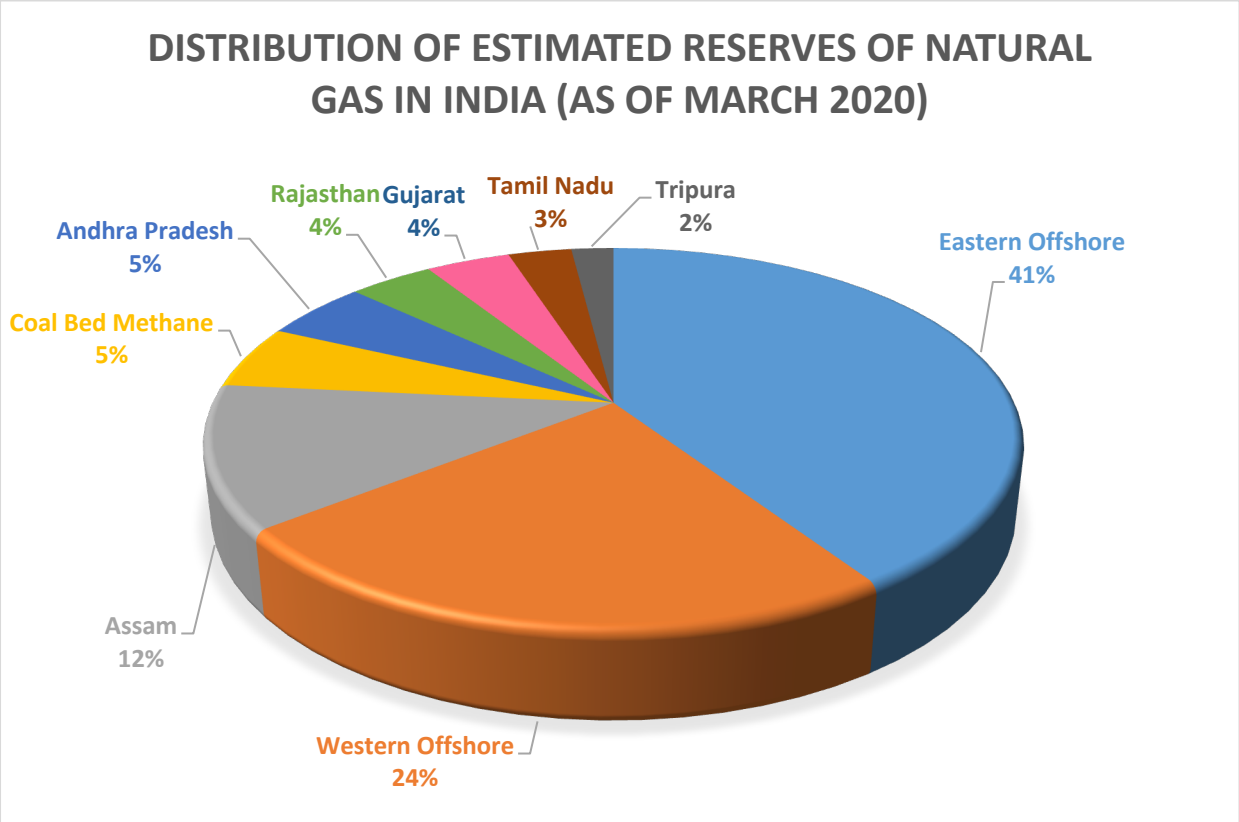


Figure 1: Distribution of Estimated Reserves of Natural Gas in India (as of March 2020)
*Source: India Energy Outlook 2021, International Energy Agency, https://www.iea.org/reports/india-energy-outlook-2021

Table 1: LNG Shipping Infrastructure of India

Existing Terminals				
No.	**Terminal**	**Commissioning Year**	**Owner**	**Capacity (in bcm)**
1	Dahej (Gujarat)	2004	Petronet LNG	17.5
2	Hazira (Gujarat)	2005	Royal Dutch Shell, Total Gaz Electricite	5.0
3	Dabhol (Maharashtra)	2013	GAIL (31.52%), NTPC (31.52%), MSEB Holding (16.68%), other smaller companies (20.28%)	1.7*
4	Kochi (Kerala)	2013	Petronet LNG	5.0
5	Ennore (Tamil Nadu)	2019	Indian Oil Corporation Limited (IOCL) (95%) + Others	5.0

6	Mundra (Gujarat)	2020	Gujarat State Petroleum Corporation (GSPC), (50%) Adani Group (50%)	5.0
Total existing capacity				39.2
Under Construction or completed (not under operation)				
7	Jaigarh (Maharashtra)	-	H Energy	4.0
8.	Dhamra (Odisha)	-	Adani Group (51%), Indian Oil Corporation (39%), GAIL (11%)	5.0
9	Jafrabad (Gujarat)	-	Exmar (38%), Gujarat Government (26%), Swan Energy (26%), Tata Group (10%)	5.0
10	Chhara (Gujarat)	-	Hindustan Petroleum Corp Ltd (50%), Shapoorji Pallonji 50%	5.0
11	Dabhol Expansion (Maharashtra)	-	GAIL (31.52%), NTPC (31.52%), MSEB Holding (16.68%), other smaller companies (20.28%)	3.3
12	Karaikal (Puducherry)		Atlantic, Gulf and Pacific Company 100%	1.3
Total under construction				23.6

**Source:* Energizing India's Progress, Annual Report 2019-20, "*Ministry of Petroleum and Natural Gas*" https://mopng.gov.in/en and India, "*Energy Information Administration,"* https://www.eia.gov/international/analysis/country/IND

Figure 2: Year-wise Production of Natural Gas in Billion Cubic Metres

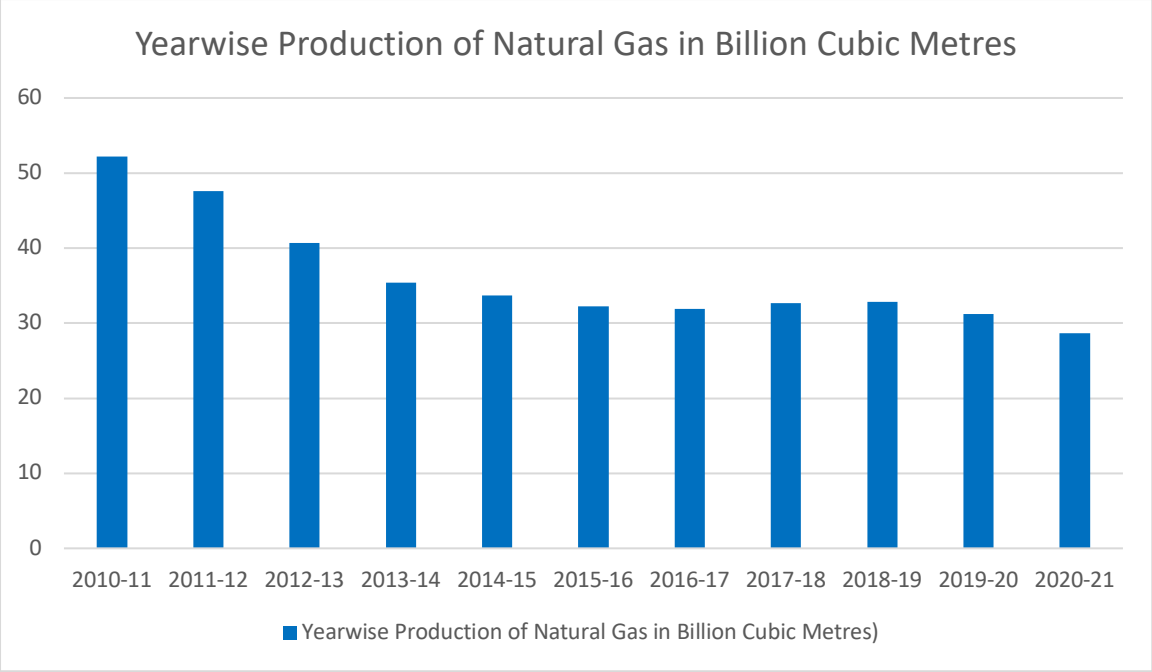


Figure 2: Year-wise Production of Natural Gas in Billion Cubic Metres
Source: India Energy Outlook, 2021, "*International Energy Agency*," https://www.iea.org/reports/india-energy-outlook-2021

Figure 3: Natural Gas Imports into India by Country of Origin in US$ Million (2010-21)

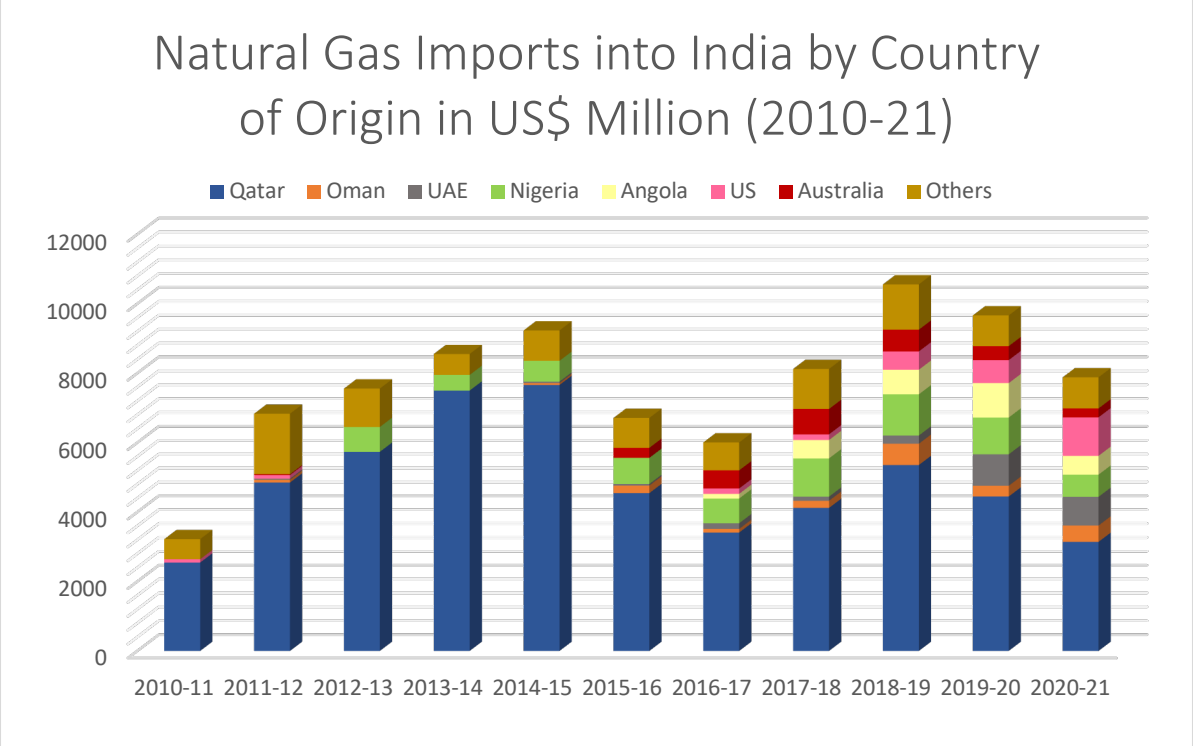
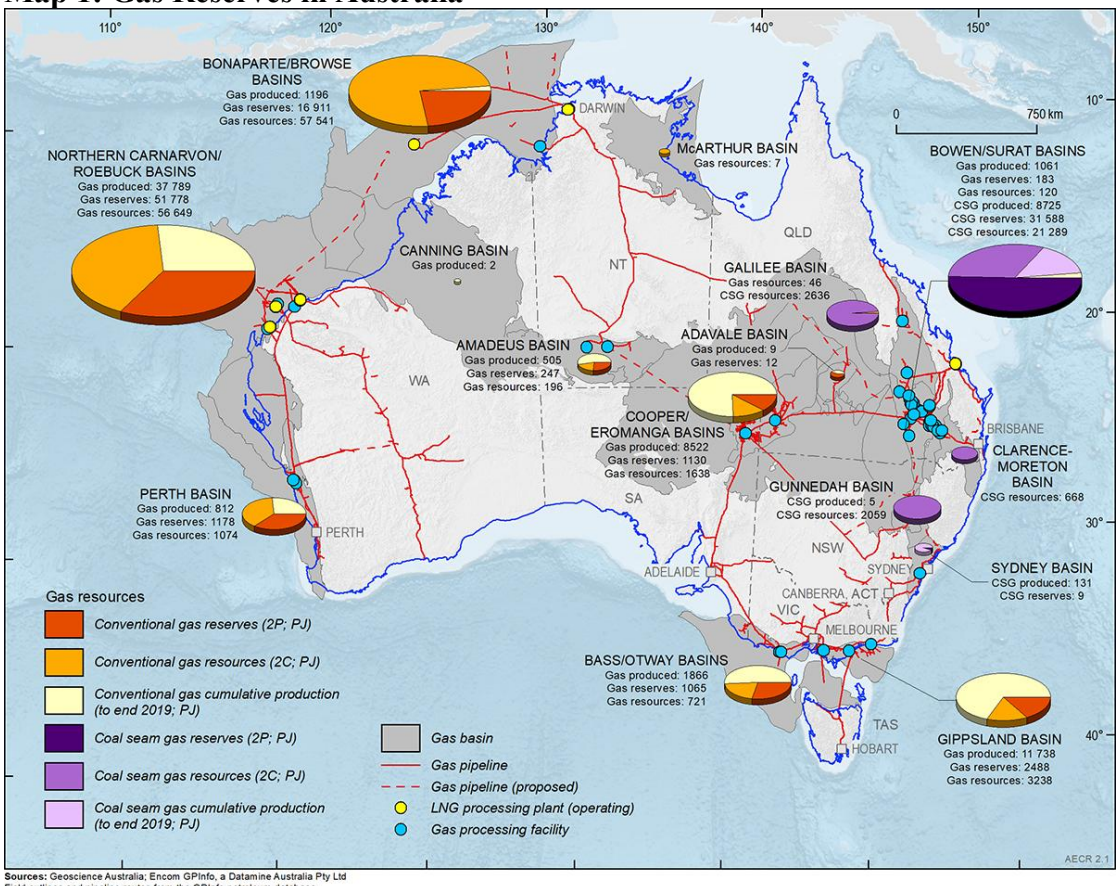


Figure 3: Natural Gas Imports into India by Country of Origin in US$ Million (2010-21)
*Source: Department of Commerce, Ministry of Commerce and Industry, Government of India, https://commerce.gov.in/trade-statistics/

Map 1: Gas Reserves in Australia



Sources: Geoscience Australia; Encom GPInfo, a Datamine Australia Pty Ltd
Field outlines and pipeline routes from the GPInfo petroleum database.
Note: LNG = liquefied natural gas, PJ = Petajoules.

*Source: Geoscience Australia, Australian Government