

LNG



The decade that was

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This issue of the feature in the GSR has been widely inspired by the changing dynamics of the LNG markets in the decade gone by, especially the transition from its traditional, more rigid structure to a traded commodity. Even though the LNG chain has been disaggregating, the pace of growth of the LNG business has continued to be driven by different parts of the chain operating independently. Demand growth in one country led to LNG supply commitment for new capacity in another country. Pricing was another area where some path breaking mechanisms evolved with the partial moving away from crude oil linked price.

The Asian region continued to dominate the LNG market with some new and upcoming markets developing in Pakistan, Bangladesh, Thailand, Bahrain, Kuwait; and Vietnam, Philippines and Myanmar waiting in the wings. China emerged as the second largest importer after Japan and in the process replaced South Korea. The decade also saw the emergence of USA as a major LNG producer/exporter.

The gradual dilution of the strict “take or pay” provisions in contracts has been the highlight of some newly signed Gas Sale and Purchase Agreements, and together with the flexibility provisions relating to destination became the norm in the second half of the decade, especially when USA LNG exports started to fructify. Short term LNG price fluctuated widely over the last ten years. In the last two years spot LNG price dropped a whopping 50% from a level of \$11.00 per MMBtu to \$5-6.00 per MMBtu. The traditional pricing formula linked to crude was challenged and the Henry Hub linkages emerged. Shell signed a contract

with Tokyo Gas partly using a coal linked pricing formula which was an unusual move for an Asian LNG buyer. This transition has been happening even with a considerable growth in the industry, LNG supply will likely increase significantly between 2009 and 2019. The robust growth has come on the back of uncertainty, the industry has been concerned with several issues besides uncertainty, be it over the level of demand or supply or the pace of technological advancement along the value chain.

During this decade we witnessed the fastest rise in the pace of global energy consumption, with natural gas accounting for 45% of the increase, much more than any other fuel. According to BP, the global LNG trade in 2018 set a record for the fifth consecutive year, reaching 431 BCM (314.5 MMT). This marked a significant increase of 181.3 BCM over 2009, or 73% in the last ten years. More than 132 BCM of this number was accounted for by non-long-term trade in 2018, equivalent to as much as 31% of total LNG trade. This is a significant increase over the decade, when the short term trade was almost non-existent. It is expected that the non-long-term market would expand substantially, due to growing LNG supply and demand elasticity. According to an Oxford Institute for Energy Studies report, in 2018 global LNG trade was 314 MMT (431 billion cubic metres) and is expected to grow significantly by 2030; projections vary from 440 MMTPA (603 BCM) to 580 MMTPA (795 BCM)—this interesting forecast was provided by Cheniere Energy which compared global trade outlooks from eight different sources: consultants, majors, and other organizations. The difference in projections reflects the widerange of uncertainties that the LNG market could be facing in the future from the supply

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World LNG Trade (Billion Cubic Metres)	
Year	Total
2009	249.7
2010	302.4
2011	328.3
2012	324.9
2013	326.8
2014	333.6
2015	337.1
2016	358.3
2017	393.9
2018	431.0

Source: BP

and demand side. The market has been changing fundamentally and, while there may have been little to distinguish many of the new potential supply projects, innovation and technological advancement in each part of the chain has been driving costs down.

The decade also saw a need to meet with the requirements of buyers who have themselves been operating in a liberalizing market with increased focus on deregulation. Many new buyers entered the market and were able to sign long-term contracts to support the financing of new LNG supply projects, either directly or through aggregators. The decade witnessed the role of traders and aggregators changing as they took positions along the chain to differentiate themselves, including sellers and buyers, seeking to trade LNG to gain an additional margin and reduce their risk. The traditional LNG contract structure where the seller took the usually oil-related price risk, while the buyer took the volume risk through long-term take-or-pay offtake contracts, started changing fundamentally. The world today is one of varying contracts, linked through aggregators/traders or directly between buyers and sellers. In 2018, 31 per cent of LNG was delivered on a spot or short-term basis and grew from a minuscule quantity at the beginning of the decade. These percentages will, no doubt, increase further as US LNG, with no contractual destination restrictions, will enable both sellers

and buyers to optimize their risks and returns by selling to the highest-value destination, with flexible markets acting as the balancing mechanism.

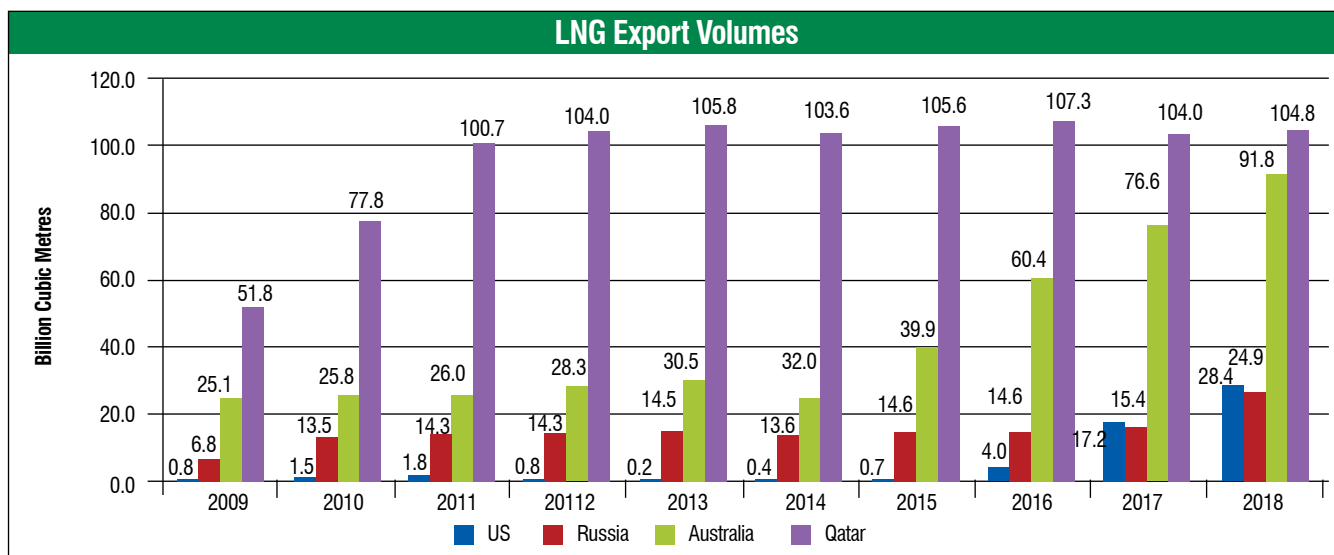
Supply side Development

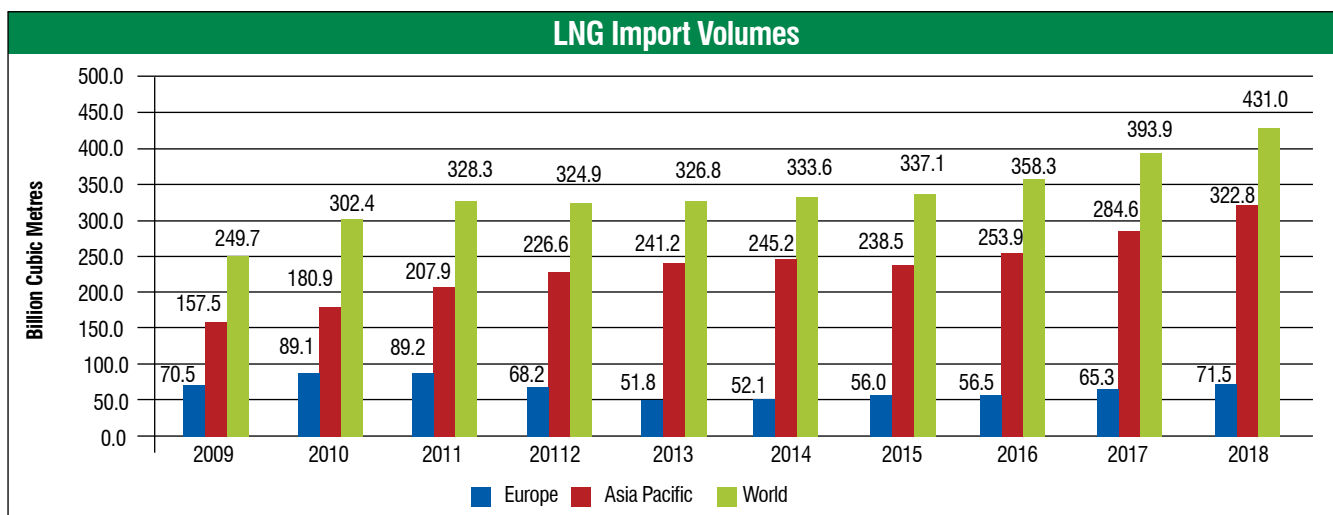
The single largest increase in LNG exports occurred in Australia, owing to new trains coming on-stream and higher utilization at existing facilities. Other significant contributors to LNG supply were the United States and Russia across new and existing trains, USA exported 28.4 BCM in 2018 and Russia 24.9 BCM. Off-shore based liquefaction facilities were developed in Australia, Malaysia and Argentina, two of the floating LNG production facilities were commissioned in the later part of the decade by Shell and Petronas. Argentina exported its first LNG cargo from a new floating facility in 2019, marking a milestone for its energy sector. Qatar continued to maintain its leading position with Australia closing in with an ever growing capacity which is now 93.7 BCM (68.6 MMTPA). Qatar announced enhancement of its current capacity of 78 MMTPA to over 100 MMTPA.

Despite the headwinds, global LNG volumes are set to expand, leading to a more competitive, globally integrated gas market. Australia, USA and Russia will add significant capacity to the liquefaction market.

Demand Side Development

Asian markets continued to see substantial demand growth despite countries moving to renewable sources and use of cheaper coal





which caused concerns to the LNG producers, although the pattern of imports within Asia may have shifted, with China, India, Pakistan and Bangladesh leading the growth. Long term sustainable contracts were the key to development of new demand. The demand in both the new and mature Asian markets grew with the strong Chinese LNG imports. Other demand drivers in the decade were the pace of efforts to reduce both CO₂ and particulate pollution and the potential start-up or phase-out of nuclear power. The depleting fields in Europe and the environmental decisions to some extent checked the drop in LNG import, especially to the UK and Spain. Spain which was the only LNG exporting country without producing a molecule of LNG witnessed a decline in their exports. Renewable energy became a challenge for natural gas in developing economies for power production. The impact of renewable was also seen on emerging economies. By the end of the decade, China emerged as the second largest importer of LNG after Japan, importing 54.8 MMT in 2018 as compared to 83.2 MMT of Japan and 44.5 MMT of South Korea. Number of importing facilities were developed across the globe, in Pakistan, Bangladesh, Egypt, Kuwait, Jordan, Argentina, Singapore, Poland, Bahrain, Lithuania; additional import capacities were developed in China, India, Turkey.

Europe continued to provide the flexibility for LNG market as demand was driven by hub gas prices, like, NBP. American LNG exports were headed for mostly the European markets after the flare up in the US-China trade war.

According to IEA, China was the main

driver of gas demand growth, strong growth in consumption in other Asian countries particularly in South Asia including India also contributed significantly to demand growth. China's growth was on the back of government's goal in improving air quality by shifting away from coal, whereas in India, Pakistan and Bangladesh the industrial sectors provided the backbone to the robust growth. Despite the domestic production in India falling substantially over the decade due to significant reduction in KG-D6 offshore production, LNG filled up the gap with an increase in import of over 100% over the decade.

The potential for additional LNG demand from the marine and road transport sectors has been attracting a lot of interest world-wide. The on road and off road application of LNG in automobiles kick started from the middle of the last decade and is expected to grow in the future. From 2020, International Maritime Organization rules will ban ships from using fuels with a sulphur content above 0.5 per cent, compared with 3.5 per cent today (unless they are equipped with scrubbers or use low-sulphur fuel). This is expected to create a demand for LNG in the marine sector.

Price side development:

There were many ups and downs in the short term LNG price and together with the roller coaster ride of crude oil over the decade, long term LNG price was equally unpredictable. As we are aware, many long-term LNG contracts are bound by strict pricing clauses, however, with LNG markets in transition, LNG contracts have also been changing, creating considerable

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contracting uncertainty for both buyers and sellers. There has been a push towards price flexibility recently. One area of importance has been the inclusion of more detailed price review provisions in newer Asian LNG contracts and the potential use of price arbitrations in case of disputes. The experience of buyers and sellers is clearly going to see an emergence of shorter price review periods and also the inclusion of triggers; downstream market conditions are likely to become more relevant in future reviews. The uncertainty in LNG price, forced a few buyers to re-negotiate their long term contracts and re-work the pricing provisions. Petronet India was possibly the first one to renegotiate.

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Consequent to the slowdown in the global economy and increasing supply, LNG price has been dropping over the last few months. Recent months have seen some turbulent times because

more spot cargoes are entering the market and buyers in Japan, South Korea and China – are holding off from purchases. The biggest worry has been the escalating tensions between USA and Iran; this could possibly lead to disruption in the Strait of Hormuz and cutting off all of Qatar's exports which amounts to 22% of global supply. Immediate impact could be doubling of spot prices.

The decade witnessed a dramatic change in the LNG market, both for the buyers as well as the sellers. The changes were adequately addressed within the gas sale and purchase contracts – take or pay provisions, shipping destinations, price reviews were some of the key provisions of the contracts which underwent modifications. The emergence of non-long term LNG trade in a big way (31% of total trade) was encouraging and could pave the way to commoditize LNG.

While the issue was in the press, the US action in Iraq/Iran produced as expected an immediate reaction in oil prices. Gas/LNG futures, however, did not show any immediate response – more proof if needed of the weakening oil-gas price link. However, it is early times yet and any escalation or dislocation in the shipping routes could impact the LNG scene even if for the short term.

Acknowledgement:

1. *The Oxford Institute for Energy Studies*
2. *International Gas Union Annual Report 2019*
3. *International Energy Association*
4. *BP*

The Natural Gas Society (NGS), a registered body, is the emerging voice of the Indian natural gas industry and has been established to catalyse the development of the industry. NGS seeks to establish itself as an industry think tank and provide critical inputs into sectoral policy through research, collaboration and dialogue. It also works towards the enhancement of India's natural gas industry's competitiveness in global energy markets. NGS provides a forum for exchange of ideas and best practices for the Indian gas industry, especially in the transmission and distribution segments of the gas value chain.



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