The Abdullah Bin Hamad Al-Attiyah International Foundation
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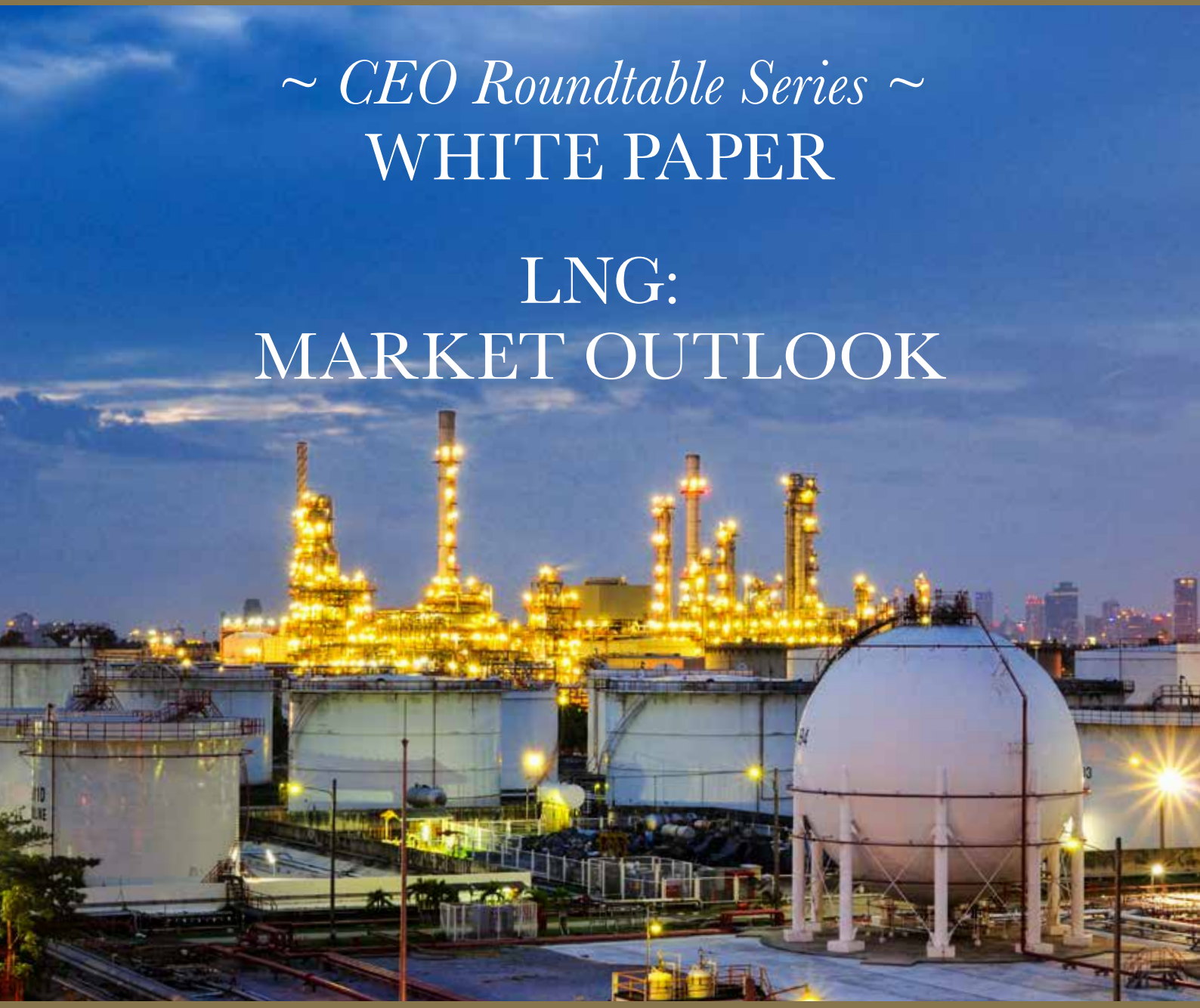
~ CEO Roundtable Series ~

WHITE PAPER

LNG:
MARKET OUTLOOK



MARKET OUTLOOK:
The Evolution of LNG Gains Pace

Since the seeds of a concept that ripened into LNG were sown by chemist Richard Doyle in the 1600s, the narrative of the market has undergone several rewrites. In today's new chapter, stakeholders are trying to navigate a supply glut that has currently given buyers more power at the negotiating table than ever before. One skill is paramount in the rulebook of what is now the world's second most traded commodity – flexibility.

The LNG market is in the midst of a perfect storm. Global LNG production volumes climbed by 4 million metric tons on 2014 to 250 million tons in 2015, with an additional 125 million tons of LNG under development likely to come to market in 2017, according to consultants Wood Mackenzie. Yet, demand is weakening, with the International Energy Agency (IEA) expecting natural gas demand to grow by 1.5% annually up to 2021 compared to the 2.2% annual growth reported over the last five years. Asia's appetite for LNG, which typically accounts for 70% of global demand, has particularly weakened. Plus, oil prices – oil-indexed LNG prices mean the market shadows oil price movements – are unlikely to climb above $50 a barrel until at least mid-2017. Combined, these market pressures mean LNG prices could remain low until the early 2020s.

NEW EXPORTERS TO RESHAPE MARKET BY 2020

Emerging LNG exporters, as well as existing providers looking to expand their market share, are reshaping the global energy map. The combined volume from the US and Australia alone could account for more than 90% of new LNG exports by 2020, with the two countries representing the majority of a 45% increase in liquefaction capacity between 2015 and 2021.

The US' first LNG export from the country's Sabine Pass on the Gulf of Mexico in February through the newly-widened Panama Canal marked a game changer that influences every aspect of the global LNG ecosystem. The US' share of global export capacity will jump to 14% percent by 2020 from base zero today, according to consultancy Energy Aspects, thus leveraging the country's access to buyers in the Pacific and Atlantic basins.

Australia is also on track to become one of the world's biggest LNG exporters thanks to a $200 billion investment into the country's LNG industry over the last decade and the country's strategic position in Asia. But, the journey has not been entirely smooth. Japan's appetite for LNG imports, which accounts for 70% of Australia's export portfolio, has dipped this year to the lowest point since the Fukushima nuclear disaster in 2011. In addition, the country's strategy to leverage its multi-billion dollar infrastructure projects to get a head start on the emergence of the US' rapidly expanding market has often faltered.

Australia's infrastructure projects are hampered by delays, bickering contractors and soaring costs,

QATAR'S PIONEERING SPIRIT

Qatar's appetite to explore untrodden energy paths has spearheaded the growth of the global LNG market since Qatargas, now the world's biggest LNG exporter, was established in 1983. Qatar launched its LNG industry against a wave of cynicism that expected the product's high capital costs to be a black mark on Qatar's economic scorecard. Instead, LNG revolutionized Qatar's economy and put the country front and center on the global energy stage. LNG, natural gas and oil revenues account for 70% of government revenues and 85% of export revenues in Qatar, which has one of the world's highest rates of GDP per capita. Qatar's coveted niche in the global LNG export market can primarily be sourced to its unique ability to provide the entire value chain – from production through to shipping – and never failing to deliver a cargo. Qatar's strategic position on the doorstep of the world's booming energy economies has helped, such as easy access to Asia, the Middle East and East Africa. An ability to adapt will safeguard Qatar's bullish track record, as illustrated by Doha's ability to immediately divert every possible ton of LNG to support long-time ally Japan following the Fukushima nuclear crisis in 2011.

$50
Oil-indexed LNG prices to remain under pressure as the IEA expects oil to remain within the $50 a barrel range till mid-2017.

4
Global LNG production volumes rose by 4 million tons on 2014 to 250 million tonnes in 2015, according to Wood Mackenzie.

120
LNG was the world's second most traded commodity in 2015 with a total value of $120 billion.

2011
Qatar's flexibility was illustrated when it sent every spare volume of LNG to support Japan following the 2011 Fukushima nuclear disaster.

which are exacerbated by generous compensation packages. Australian workers typically take home up to 35% more than their US counterparts.

The initial optimism associated with the $34 billion joint-venture Ichthys LNG project near Darwin in Australia's northern territory – one of the world's most expensive such projects – has been diluted by constant setbacks. Slipped schedules and a $17 billion overspend have also put the industry's spotlight on the Gorgon LNG terminal in Western Australia, which is poised to be a key supplier to Asia with up to 15.6 million tons of LNG per year over four decades.

In Iran, it was unclear whether the lifting of the majority of the Western-imposed sanctions on the 17th January would mark the emergence of a new LNG juggernaut, or encourage the development of a medium-sized supplier. In less than a year, energy stakeholders have surmised that the country's economic and political hurdles mean the short-term outlook is more likely to be the latter. Iran has struggled, even pre-sanctions, to achieve the level of market penetration that the country's position as home to the world's second largest natural gas reserves should have enabled it to achieve.

Low oil prices are squeezing Iran's already cash-strapped energy sector – $200 billion is required to rejuvenate the country's oil industry alone – so it is unlikely that plans for LNG infrastructure projects will be realized quickly.

Plus, remaining sanctions are curtailing foreign investment and questions linger over how reliable a long-term supplier Iran will be considering its large seasonal domestic demand. Local and foreign investors will likely hold off major financings until the country's new political tone emerges after the presidential elections in May next year.

Still, Tehran's financial acumen during the sanctions – subsidies were cut and inflation fell by over 30% from 2013 to 2016 – may reveal a savvy exporter that appreciates today's export market is brimming with more competition than the one it stepped back from over a decade ago.

FRESH BUYING APPETITE EMERGES

A wave of new buyers is expected to soak up a portion of the glut, including the 50 million tons of 'homeless LNG' – product without fixed customers - anticipated by 2020. But, only time will tell how much. Egypt, Jor-

50

Up to 50 million tons of 'homeless LNG' - product without fixed customers - is anticipated by 2020.

70%

Japan's LNG demand accounts for over two thirds of Australia's export portfolio.

125

Another 125 million tons of LNG is likely to come to market in 2017, according to Wood Mackenzie.

dan, Poland and Pakistan became LNG importers for the first time in 2015. Pakistan signed a 15-year agreement to import up to 3.75 million tons of LNG a year from Qatar in a $16 billion deal in February, for example. Bahrain, Vietnam, Honduras, South Africa and the Philippines also report rising LNG demand, while Indonesia started imports into its Arun terminal in 2015 after the facilities had been used for production since 1977.

The US' LNG cargoes have already set sail for Argentina, Chile, Brazil, India, Portugal, Dubai and Kuwait. It has been nearly 120 years since the US regularly used the maritime route to transport oil to the Middle East, before the discovery and production of the region's own natural energy reserves reduced traffic. The new dynamic demonstrates that flexibility amongst stakeholders is vital to economic success and energy security; uncertainty is often the only certainty in global commodity markets.

The IEA expects the Middle East's gas demand to almost double by 2040, with a rapid population growth and industrialization over the last four decades showing little sign of easing. The Gulf's LNG exporters secured coveted long-term supply contracts for Asia before the depth of local demand was fully appreciated. Consequently, LNG infrastructure that was built to feed demand in Asia and Europe has increasingly been used since 2012 to help support the GCC region, particularly Kuwait, Oman and the UAE. The region's LNG imports from the US and others are likely to continue as the 230-mile Dolphin gas pipeline from Qatar's North Field to the UAE and Oman remains the Gulf's only transnational submarine pipeline.

Europe's rising LNG demand is well-timed for the US' blooming export market, especially as production in the North Sea dwindles. A surge of US LNG volumes into Europe raises questions over the future role of Russia's state-backed gas giant, Gazprom. Gazprom has long been Europe's primary, if oft-tempestuous, gas supplier with an established and comprehensive pipeline network. But, intensifying competition could encourage Gazprom to rethink its pricing structure for European exports.

The UK's British Gas owner Centrica will extend its imports from Qatar when the countries' current contract expires in late-2018 with a new £2 billion ($2.6 billion) deal that will enable the UK to purchase up to 2 million tons of LNG per year from January 2019 to 2023. Qatar also deepened its footprint in continental Europe with a cargo to Poland in June marking the country's first import from the Middle East.

34

The cost of Australia's Ichthys LNG development was one of the world's most expensive such projects at $34 billion.

200

Australia has invested approximately $200 billion into its LNG industry over the last decade.

2nd

Iran is home to the world's second largest natural gas reserves.

LNG stakeholders' conversations increasingly touch upon the impact of emerging green economies on the oversupplied market, with the product coined as 'the cleanest hydrocarbon'. But, a lack of legislation to bolster the use of gas fire generation and the adoption of LNG bunkering – aside from in northwest Europe – must be tackled by market leaders at the United Nation's Framework Convention on Climate Change (UNFCCC) Conference of Parties (Cop 22) in Marrakesh in December to bolster the product's usefulness. LNG stakeholders will need to tread carefully, as the correlation between environmental policy and rising LNG imports is not guaranteed to continue. Japan, for example, plans to cut LNG imports by 30% on 2014 levels to 62 million tons a year by 2030 and fill the supply gap with nuclear power and renewable energy.

BUYERS' INFLUENCE TRIGGERS CHANGE

The perceived switch in power from sellers to buyers caused by the supply glut has created a skittish market. Unexpected windfalls thanks to lower LNG prices would typically be welcomed news for buyers. Yet, there are mixed feelings in Asia and Europe as importers are concerned that less infrastructure investments by cash-strapped suppliers today will squeeze supply and prompt a price rally in the early 2020s. Only one LNG project has reached a final investment decision (FID) this year, cautions the IEA, while investments in gas fell by $10 billion in 2015 on the previous year. Plus, oil and gas field spending fell by 25% in 2015 to $583 billion and is set to drop by a further 24% to about $450 billion in 2016.

For now, buyers are leveraging their revised position at the negotiating table. Some Asian importers are addressing restrictions on selling their excess supply; a point that has gained prominence as buyers' surplus has increased since mid-2014. Japan's Fair Trade Commission is carrying out a preliminary investigation into whether re-sale restrictions on the majority of its surplus volumes are valid. This process mirrors Europe's journey when the European Commission decided in 2004 that such clauses unfairly restricted competition. If Japan is successful, up to $600 billion worth of deals may be adjusted and the volumes of potential resales could position Japan as a quasi LNG hub.

Amidst rapidly shifting market dynamics, flexibility is integral to maintaining good relationships, as highlighted by the renegotiation of a LNG contract between India's Petronet and Qatar's RasGas in late-2015. The countries' initial contract did not reflect a standard LNG deal and an adjustment offered by Qatar in extreme market circumstances

15

Pakistan signed a 15-year agreement to import up to 3.75 million tons of LNG a year from Qatar in February.

1977

Indonesia's Arun terminal, which was used for LNG production for nearly four decades, was converted to accept LNG imports from early 2015.

X2

The Middle East's gas demand is expected to almost double by 2040.

– quantified by an elongated period of low prices – was considered a natural step to safeguard the historically strong New Delhi-Doha relationship. The renegotiation will save India $605 million a year.

Buyers have often voiced a preference to introduce more short-term contracts to complement the long-term deals that have long characterized the LNG market, with the latter being essential to guaranteeing financing to support the high capital costs of LNG infrastructure. Today's supply glut means buyers' demands are gaining traction. Around 28% of the LNG traded in 2015 was on a spot, or short-term basis, versus 18.9% in 2010, according to the International Group of Liquefied Natural Gas Importers. Japan's Jera, the world's biggest single importer of LNG, said in August that it will reduce its long-term imports from the current 34.5 million tons a year by 42% to 20 million tons a year by 2030.

The rise in short-term contracts has been facilitated in part by the development of floating storage regasification units (FSRUs), floating LNG (FLNG) production units and floating import units (FSUs). The capital expenditure for all three will total $41.6 billion between 2016 and 2022, compared to $11.4 billion between 2011-2015, according to Douglas Westwood's World FLNG Market Forecast.

FSRUS, for example, are relatively cheap, have quick entry to market and can largely avoid geopolitical and natural hazards, as demonstrated by the off-shore LNG supply to support Yemen's seized southern port city of Aden in 2015.

The growth of spot and short-term contracts, spearheaded by buyers and facilitated by technological developments, is opening the gateway for trading companies like Vitol, Trafigura, Gunvor and Noble Group to expand their activities. LNG was the second-largest commodity traded in 2015 with a total value of $120 billion, which was also supported by the growing participation of financial institutions and Japanese utilities, such as Osaka Gas, Tokyo Gas, Jera and Shizuoka.

EVOLVING INDEXATION AND BUDDING HUBS

Historically, the embryonic state of the natural gas market meant gas and LNG prices were linked to oil prices. This has remained the status quo, despite the growth of LNG as a standalone market. The 70% fall in oil prices since mid-2014 has intensified

calls by a growing majority of LNG stakeholders to break away from oil-indexed LNG prices and establish a 'true' price that reflects the supply-demand balance in LNG alone. Other market participants argue that shifting away from oil-indexed LNG prices now would be poor timing for a market already undergoing significant change.

Volumes are rising on the JKM benchmark, which is energy pricing agency Platts' LNG price assessment for physical spot cargoes delivered into Japan and South Korea. The JKM could emerge as a stepping stone to establishing a hub index for Asia, be it in China, Japan, or Singapore. Some LNG stakeholders argue that China would be the most viable option as it already imports large quantities of gas from Central Asia and has underutilized re-gasification facilities. But, Beijing would first need to significantly improve regulation and transparency. While Japan and Singapore have the regulatory sophistication, Japan's market is fragmented and Singapore's small physical volumes means it would be better placed as a hub for the South East Asian market only.

Rising volumes on the Dutch Title Transfer Facility (TTF) and the UK's National Balancing Point (NBP) have established Europe as a pricing hub and expectations of a particularly cold winter will likely prompt a spike in prices. Meanwhile, the US may benefit from taking local pricing structures into account when expanding its export portfolio, as the country's Henry Hub indexation holds less relevance outside the US.

The turbulent nature of global commodity markets means that the narrative of LNG will experience many more twists and turns, but there is no doubt of the weight that this product now holds in terms of energy security and economic value. An ability to flex in line with the LNG market's evolving status quo – new demand, new supply, new hubs – will herald the winners of a market that is rapidly climbing to the top of the global energy hierarchy. ●

230

The number of miles that the Dolphin pipeline from Qatar's North Field to the UAE and Oman traverses – the Gulf's only transnational submarine pipeline.

1st

Qatar's LNG exports to Poland from June marked the European country's first such imports from the Middle East.

30%

Japan hopes to reduce its LNG imports by almost a third by 2030.

2030

Japan's Jera, the world's biggest single LNG importer, plans to reduce long-term imports by 42% by 2030.

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