

New horizons

The forces shaping the future of the LNG market

July 2019

Reshaping flows

New LNG supplies bolster global connectivity

Opening up

Gas market liberalization promises future growth

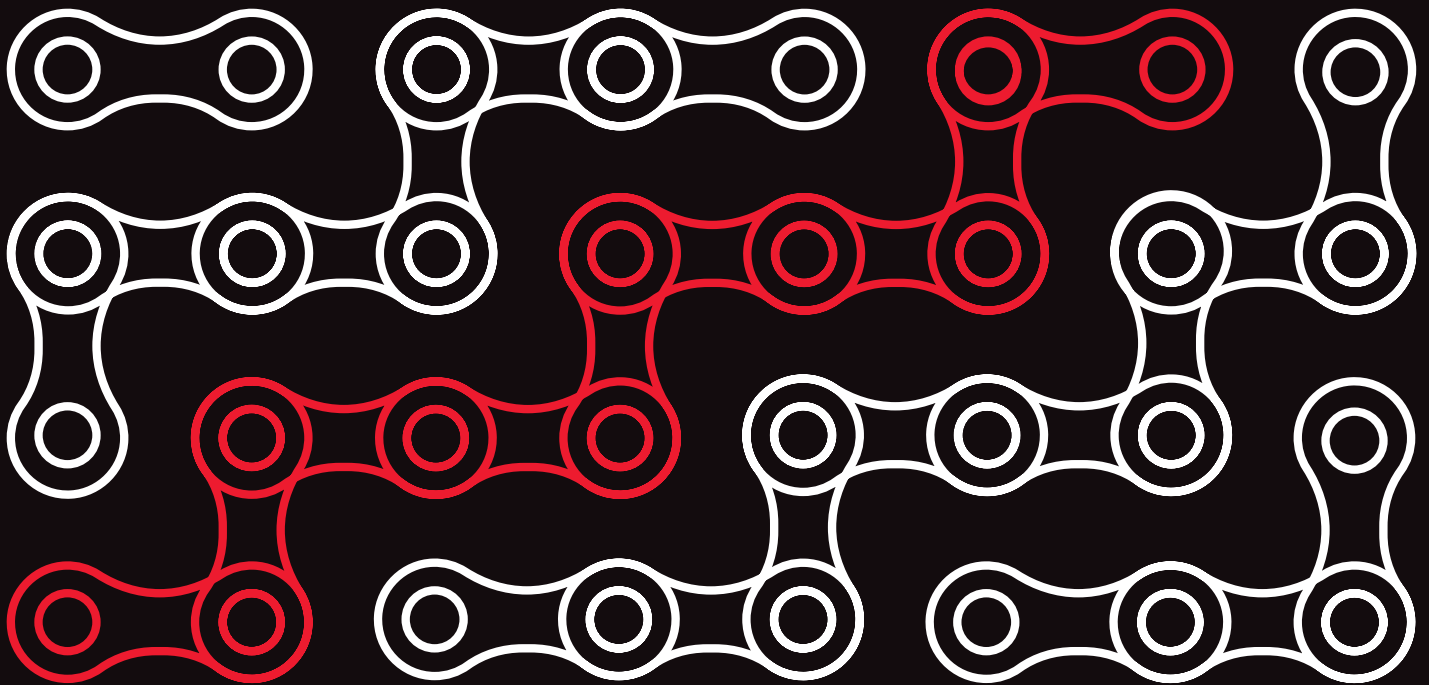
Liquidity lift-off

Surge in LNG derivatives trading set to continue

Industry perspectives

Flexibility key to sustainable growth: IEA's Biorol

Information alone
isn't informative.
Add insight.



S&P Global
Platts

Our unrivaled insight and analysis, alongside our independent price benchmarks and supply chain dynamics, bring clarity and transparency to the energy and commodities markets, enabling you to spot trends and uncover new commercial opportunities.

#SPGPlattsInsight

Visit platts.com/insights

Contents

July 2019

Lead Author
Abache Abreu

Lead Editor
Stuart Elliott

Copy Editor
Alisdair Bowles

Contributors
Harry Weber, Ross Wyeno, Samer Mosis,
Lucie Roux, Shi Yun Fan, Jeffrey Moore,
J Robinson, Eric Yep, Chinmayee Atre,
Masanori Odaka, Srijan Kanoi, Kenneth Foo,
Desmond Wong, Luke Stobbart, Ira Joseph

Design and Production
Martina Klančičar, Marc Quaglia

Cartography
Ginny Mason

Digital Content Leader
Mark Pengelly

Content Project Manager
Carrie Bharucha

S&P Global Platts
20 Canada Square, 9th Floor
London, E14 5LH, UK

President
Martin Fraenkel

Global Head of Market Insight
Sarah Cottle

Global Head of Commodities Pricing
Dave Ernsberger

Global Head of Analytics
Chris Midgley

S&P Global Platts
Insight

Introduction	4
<i>The opportunities, complexities and challenges facing the global LNG market</i>	
 Video	4
<i>Abache Abreu outlines the state of the global LNG market's evolution and what lies ahead</i>	
Executive summary	6
Infographic: LNG goes global	8
Infographic: Forces of change	10
Industry perspective: Fatih Birol	12
<i>An interview with the executive director of the IEA</i>	
Flexible supplies: Reshaping flows	14
<i>US LNG exports and increased liquidity are boosting connectivity</i>	
European hubs: More than a balancer	18
<i>Europe's strategic position is affording it a significant role in the global market</i>	
Asian buyers: Opening up	24
<i>Gas market liberalization is giving a helping hand to growth</i>	
Financing solutions: Getting imaginative	28
<i>New financing and contract models are springing up in the latest wave of LNG development</i>	
Evolving fleet: Rising to the challenge	32
<i>Improved shipping and technology should help in the hunt for arbitrage opportunities</i>	
Term contracts: Long story short	36
<i>New horizons for the LNG market appear as the sun sets on long-term contracts</i>	
Spot liquidity: Ebb and flow	38
<i>Whatever the market's ups and downs, LNG spot trading is becoming more robust</i>	
Trading standardization: Ripe for change	40
<i>The path toward more standardized, efficient and competitive trading is becoming clearer</i>	
Derivatives growth: Liquidity lift-off	42
<i>The LNG market's evolution will continue to drive derivatives growth</i>	
Industry perspective: Joe M Kang	46
<i>An interview with the president of the IGU</i>	
Fading taboos	48
<i>How should LNG market stakeholders react to changes in the market?</i>	

Introduction



Abache Abreu
LNG Content Lead

The new decade will present LNG stakeholders with immense growth opportunities, but they must be prepared to navigate complexities and challenges never seen before to build a sustainable industry.

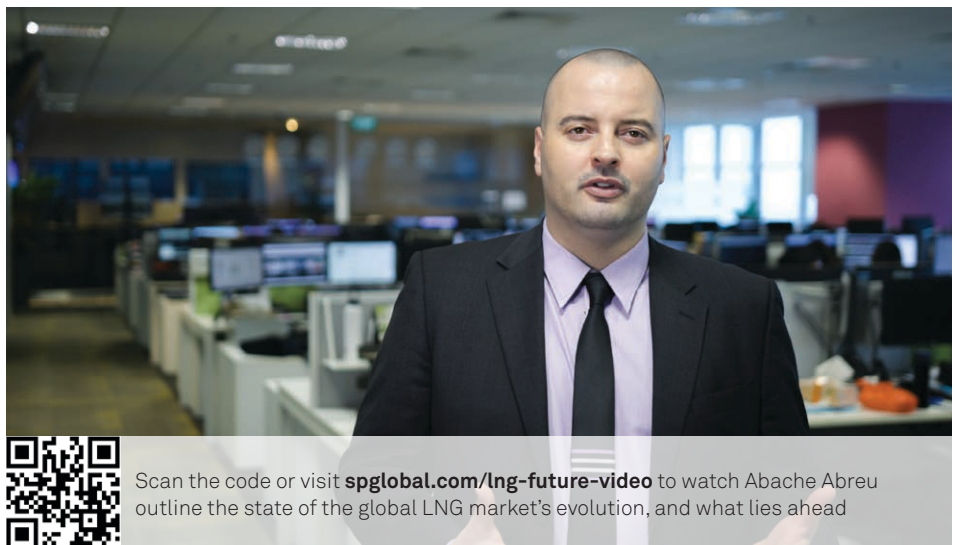
Five years of rapid supply expansion and trade liberalization have led to a surge of liquidity in both physical and financial LNG markets, which has increased market transparency and challenged traditional supply models and business strategies.

However, the prospect of LNG supply shortfalls and gluts through the next decade to 2030 is a warning sign that the industry is still exposed to abrupt investment cyclicality, a phenomenon known to cause disruptive supply shocks, price volatility and demand destruction.

The transition to a more sustainable growth path will require a deeper transformation of LNG into a more competitive, transparent and cleaner fuel.

Cost competitiveness will be key for this capital-intensive commodity to establish itself as the fossil fuel of choice in an increasingly crowded and competitive power generation market, and accelerate the adoption of LNG in new industries such as transport and agriculture.

The industry's biggest growth potential lies outside the traditional large demand centers of Europe and Northeast Asia, but these areas also present its biggest hurdles in the form of downstream inefficiencies, uncertain regulatory environments and highly embedded price subsidies.



Scan the code or visit spglobal.com/lng-future-video to watch Abache Abreu outline the state of the global LNG market's evolution, and what lies ahead

Who pays the bill for building a more sustainable demand outlook will inevitably depend on the future structure of the market, and with many supply projects moving ahead without long-term commitments, buyers will likely continue to call the shots.

Enhanced transparency will be vital for stakeholders to share these new risks and gain the confidence they need to trade and make long-term investment decisions, from developers pursuing project financing to utilities deploying more capital in import infrastructure.

Transparency has grown significantly over the past few years, driven by an increasingly liquid spot market and exponential growth in LNG derivatives, which is attracting more risk management activity.

At current growth levels, trading volumes of Platts JKM derivatives could exceed global physical trade by 2021, and dwarf it many times over by the mid-2020s. Meanwhile, established gas hubs such as the Dutch TTF remain readily applicable alternatives for hedging financial and physical exposure.

This increasingly robust financial architecture is a game changer and paves the way for the development of LNG as a commodity in its own right. But it is not the endgame.

With the correlation between LNG and oil pricing forecasts breaking down, the elimination of oil indexation is increasingly considered necessary. More standardized trading practices will be required to build liquidity and efficiency, and growing flexibility in term contracts needs to be accompanied by a solid risk strategy at both ends of the supply chain.

The green credentials of LNG will also face increasing scrutiny in a world where the environmental and economic costs of climate change are becoming ever clearer. The dirty coal card is too low a bar, and effective solutions will be needed to reduce the industry's carbon footprint.

The stakes are high. Global fossil fuel demand is expected to peak over the next decade, threatening trillions of dollars in energy asset investments. As we enter the era of renewables, these green credentials might determine whether LNG becomes simply a transition fuel or a true partner in a more environmentally sustainable future.

Executive summary

Flexible supplies: Growing flexible US volumes and new supplies from Qatar, Russia and emerging producers will open up new LNG trade flows and reinforce global interconnectivity in the 2020s, reducing overall voyage lengths, lowering delivery costs and creating fertile ground for the development of spot and risk markets. But there are conflicting forces: just as LNG occupies a more central role in national energy and economic strategies, it has also become increasingly exposed to trade battles that could fragment trade flows.

European hubs: With extensive regasification and storage capacity, flexible demand and liquid trading options, Europe is steadily cementing a key role in the global LNG market. It is emerging not only as a global balancer, but also as a demand center in its own right, price anchor, and ‘put option’ due to its ability to efficiently redirect cargoes or absorb surplus volumes in times of oversupply, a market condition that is likely to reappear in the mid-2020s.

Asian buyers: The domestic liberalization campaign that Japan spearheaded in 2016-2017 with the deregulation of its domestic power and gas retail sectors is gaining supporters elsewhere in Asia, with specific targets set up not only by traditional importers, but also emerging ones across south and southeast Asia. The liberalization and fragmentation of Asian buyers will redefine the face of global energy demand in the new decade, and LNG will need to prove itself as a clean, flexible and affordable fuel.

Financing solutions: With fundamental uncertainties ahead, the industry is watching closely whether new proposed

liquefaction financing solutions and contract models succeed in bridging the gap in expectations between customers and financiers, and accelerating the pace of FIDs in 2020 and beyond. In an increasingly crowded field of project financiers, the threshold at which flexible supply is shut in will inevitably fall, with significant implications for stakeholders.

Evolving fleet: The expansion of the global LNG shipping fleet and the evolution of its technologies and commercial arrangements will be critical in shaping the ever more flexible nature of LNG. Over the next 10 years, the sector will play a vital role in enhancing trade efficiency, overcoming the industry’s physical barriers, and giving stakeholders room to capture optionality and arbitrage opportunities.

Term contracts: The traditional supply model is getting ready for its final send-off, as end-users fret over demand uncertainties, new financing solutions emerge and legacy contracts expire. In a supply-driven marketplace and amid uncertainties over downstream market liberalization, procurement trends are undoubtedly shifting toward contracts that are shorter, smaller, more flexible and priced not against an associated commodity, but LNG itself.

Spot liquidity: Despite the fundamentally unstable nature of LNG as a tradable commodity and the cyclical peaks and troughs forecast for the next 10 years, LNG spot trading will continue to evolve, creating a more liquid, diverse and transparent marketplace. Increasingly robust physical spot pricing benchmarks and forward curves will become central to

trading and investment decisions across the LNG supply chain.

Trading standardization: It has been a well-documented struggle to drive standardization in an industry that originally grew up based on rigid long-term bilateral contracts, with deeply entrenched use of master sales and purchase agreements and a diversity of trading arrangements. Progress has been hamstrung by the complex nature of transporting and storing LNG. But growing liquidity and bold steps taken by traders, exchanges and price reporting agencies could yield results and boost the efficiency of trading practices.

Derivatives growth: Explosive growth of LNG derivatives has been a game changer for the global LNG market, driving forward-pricing transparency and boosting the industry’s hedging capabilities. A more liquid spot physical market and the entrance of financial players are expected to take that development to a new level over the next few years, while the ramp-up of new physical LNG export projects will bring an entirely different perspective into the LNG derivatives space, where the spread between US gas and consumer market prices may matter more than that between European gas and Asian LNG.

Shifting strategies: LNG stakeholders face an acute need to reposition themselves as competitive threats from all directions are set to accelerate the evolution of LNG toward a modern, fundamentally driven commodity. With supply options building and demand options limited, the financial burden of growing demand and building infrastructure will continue to shift from the buyer to the seller.

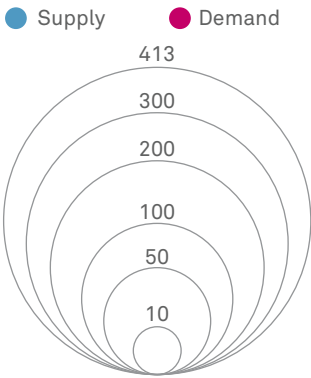


LNG goes global

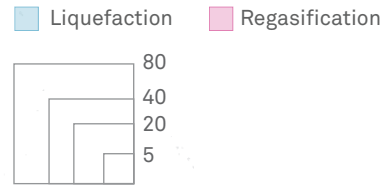
Growing flexible supplies and rising spot liquidity will cement the transition of LNG from a rigid, bilaterally traded commodity to a more interconnected and efficient global market where cargoes are free to cut a path to the best netback. More than 200 million mt/year of additional liquefaction capacity will be added globally over the next two decades, while spot trading will incentivize greater optimization and reductions in voyage lengths and final delivered costs. But there are conflicting forces: just as LNG occupies a more central role in national energy and economic strategies, it has also become increasingly central to foreign policy and exposed to trade tensions, sanctions and barriers that are threatening to fragment trade flows and disrupt growth.

LNG trade data, 2018

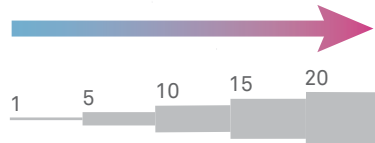
Supply and demand (million mt/year)



Facilities (million mt/year)



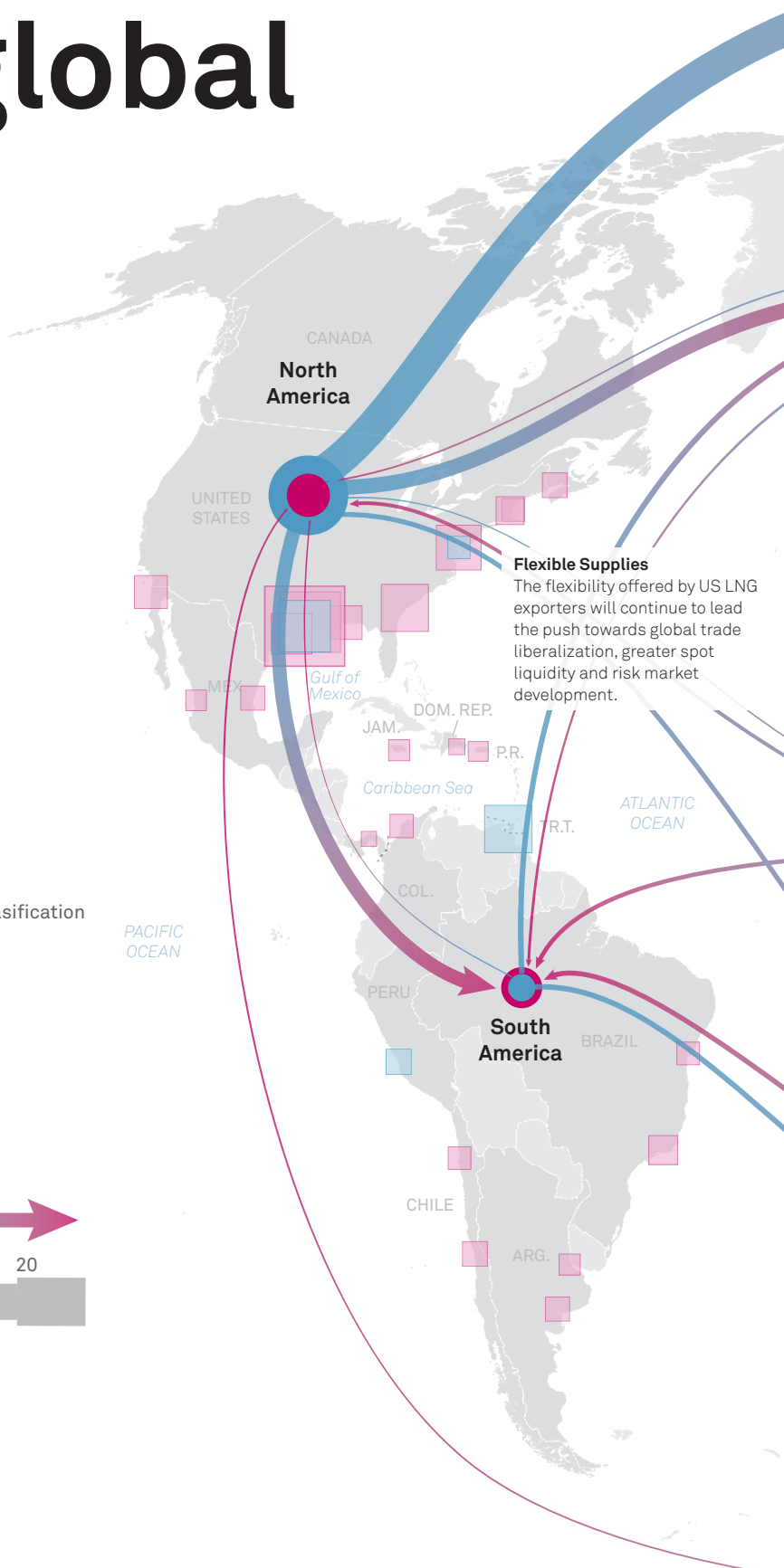
Trade flows (million mt/year)



Countries included in dataset

Some LNG facilities have been aggregated based on location. Proposed facilities are not included.

Source: S&P Global Platts Analytics

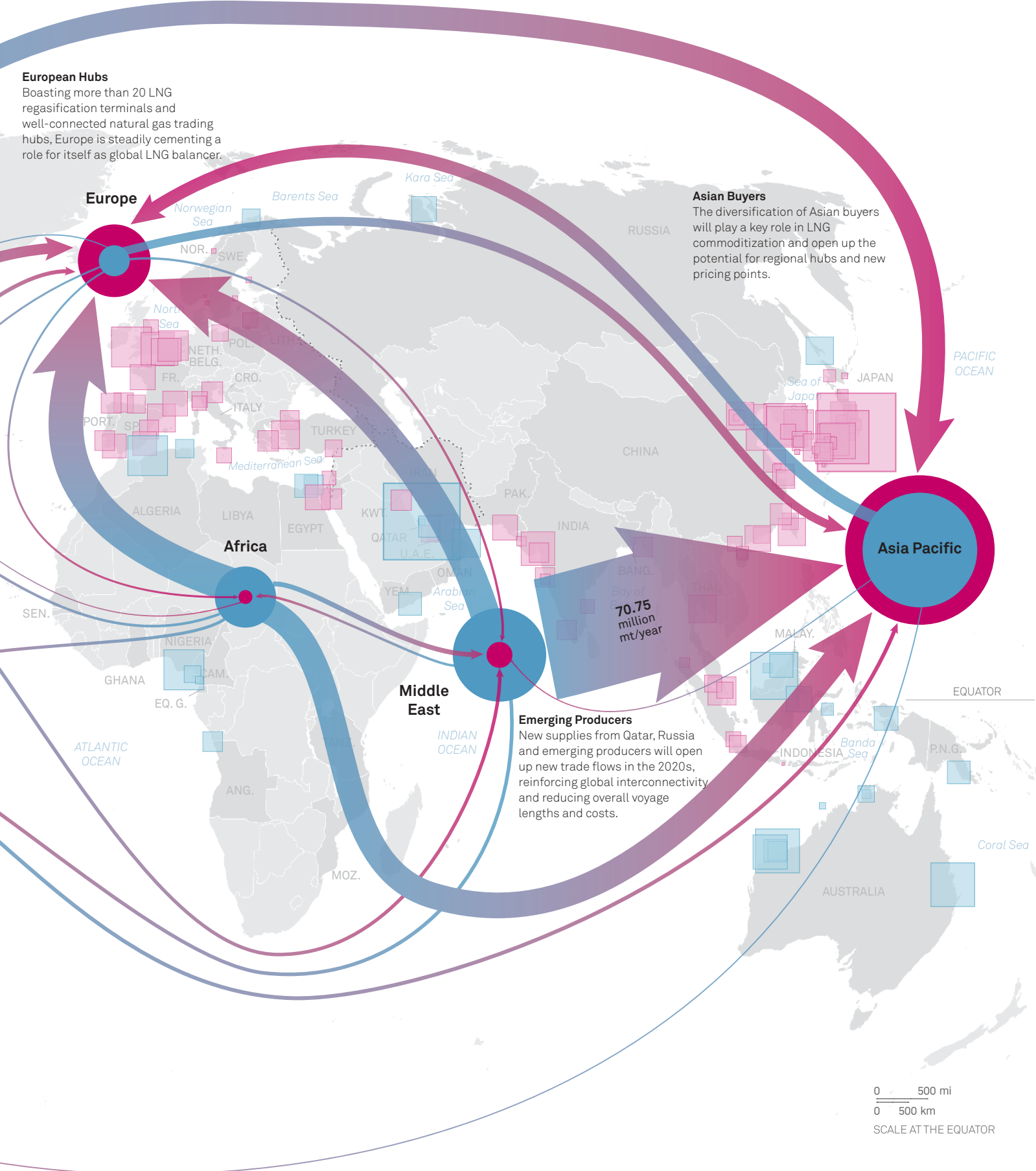


European Hubs

Boasting more than 20 LNG regasification terminals and well-connected natural gas trading hubs, Europe is steadily cementing a role for itself as global LNG balancer.

Asian Buyers

The diversification of Asian buyers will play a key role in LNG commoditization and open up the potential for regional hubs and new pricing points.



Africa

Middle East

Asia Pacific

70.75 million mt/year

Emerging Producers

New supplies from Qatar, Russia and emerging producers will open up new trade flows in the 2020s, reinforcing global interconnectivity and reducing overall voyage lengths and costs.

0 500 mi
0 500 km
SCALE AT THE EQUATOR

Forces of change



Flexible supplies

Growing flexibility will open up new trade flows, reinforcing global interconnectivity and reducing voyage lengths and costs.



European balancers

Europe will cement its key role in LNG as a global balancer, price anchor and demand center in its own right.



Buyer liberalization

Asia's downstream liberalization will redefine LNG demand, and LNG will need to prove itself as a clean, flexible and affordable fuel.



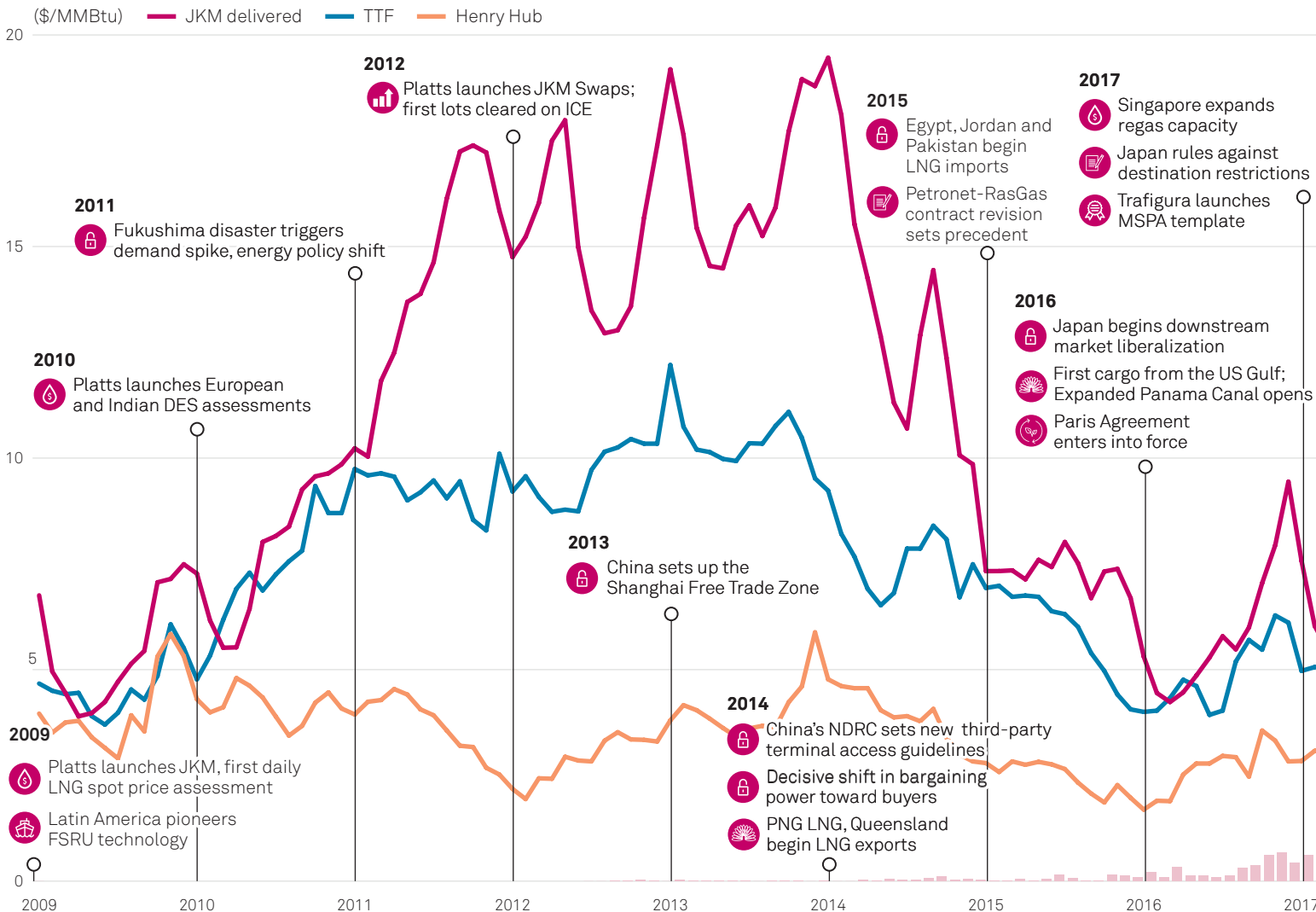
Financing solutions

New financing solutions will help bring down project costs and bridge the gap in expectations between customers and financiers.



Evolving fleet

The LNG shipping fleet evolution will enhance trade efficiency and help stakeholders capture optionality and arbitrage opportunities.



Source: S&P Global Platts Analytics



Term deals

Procurement trends are undoubtedly shifting toward contracts that are shorter, smaller, more flexible and priced against gas/LNG.



Rising spot liquidity

Spot trading will grow more liquid, diverse and transparent, fortifying the role spot benchmarks play in trading and investment.



Trading standardization

The standardization of contracts, operations and regulations will improve operational flexibility and trading efficiency.



Derivatives growth

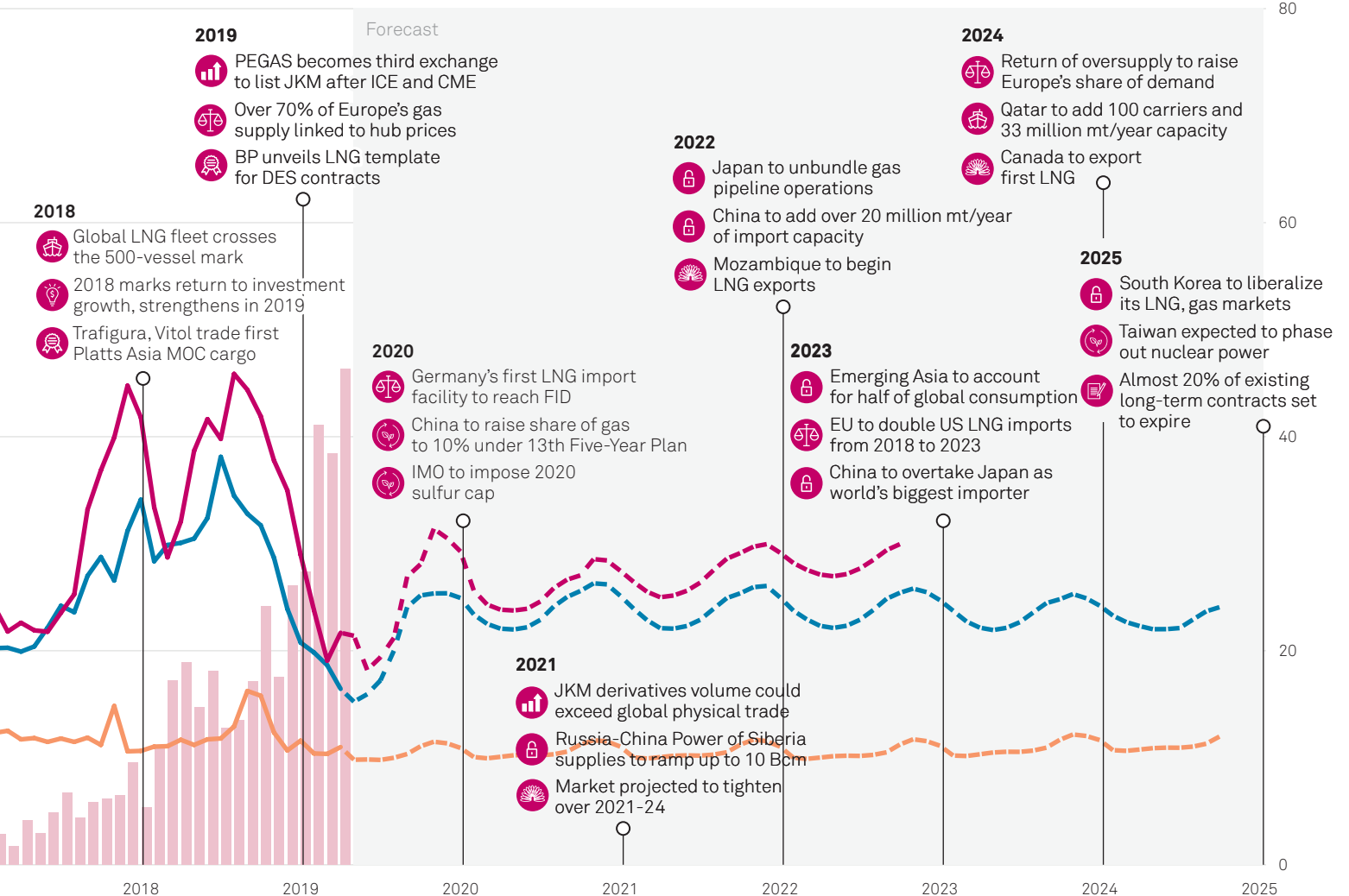
Growth in derivatives will drive forward-pricing transparency and boost the industry's hedging capabilities and confidence.



Environmental solutions

LNG will be compelled to reduce its carbon footprint to remain an environmentally sustainable fuel in the era of renewables.

JKM derivatives cleared through ICE and CME (‘000 lots)



Note: Platts JKM is the benchmark price for spot LNG in Northeast Asia.

Enabling sustainability

Cost competitiveness, operational flexibility and sustainable pricing are crucial to the long-term development of LNG, argues the IEA's Fatih Birol.

By Abache Abreu



Fatih Birol
Executive Director
International Energy Agency

How can LNG transition to a more sustainable growth path?

Additional investments will be needed to avoid the prospect of a tight market. 2018 marked a return to LNG investment growth after several years of decline, and it is gathering speed in 2019. More capacity was sanctioned in the first quarter of this year than over the past two years, plus there is a long list of projects that have announced that their final investment decision is set to be taken in 2019.

Flexibility is key to adapting to the growing role of more price-sensitive buyers from developing economies. We have observed profound changes in recent years with the development of spot trading, the emergence of global portfolio players and an increase in destination-free contracts. LNG is also growing in terms of diversity, from a limited number of importers – less than 10 in 2000 – to over 40 last year, and almost 50 in the coming decade. LNG is no longer the privilege of rich importers.

Prices in fast-growing economies also need to converge with international benchmarks to ensure long-term market development and foster domestic investment.

What should stakeholders do to enhance the industry's cost structure?

Flexibility is of paramount importance – the development of short-term trading and pricing reforms are necessary preconditions to the emergence of gas trading hubs in emerging markets. Liquid trading hubs will enable a shift from oil indexation and regulated pricing to prices reflecting supply and demand fundamentals – and therefore downstream competition.

The changes also encompass LNG project financing – recent investment decisions have highlighted an evolution with several projects going ahead without the support of long-term contracts. Global portfolio players are creating an alternative to traditional project financing by using their own balance sheets and supply portfolios to take investment decisions.

“Operational flexibility and competitiveness is improving with more standardization of contracts, operations and regulations – to have a truly global market everybody needs to speak the same language.” — Fatih Birol

Another changing link of the chain is shipping, which is moving to more flexible and short-term chartering to adapt to the changes in LNG trading.

Finally, operational flexibility and competitiveness is improving with more standardization of contracts, operations and regulations – to have a truly global market everybody needs to speak the same language.

How important are LNG's green credentials for the industry's success?

2018 is a very good example of the positive contribution gas can make, with the rise of Chinese consumption which is mainly driven by policy action to battle against air pollution. Improving air quality in major urban areas is a key concern in many countries, and gas is one of the tools that help reduce air pollution and CO2 emissions.

The use of LNG in maritime transportation is another interesting example. It is currently a niche market – especially outside of LNG carriers – yet the fleet of LNG-powered vessels is growing fast and is expected to double by 2024, as analyzed in our recent medium term forecast (Gas 2019). The market is being driven by the implementation of the International Maritime Organization's global sulfur cap on maritime fuels from January 2020. Passenger ships, and cruise ships in particular, are expected to be large contributors to this expansion of the LNG-powered fleet.

What are the key steps stakeholders can take to reduce LNG's carbon footprint?

Efforts must continue to minimize the environmental footprint of gas use. This includes progress on CO2 emissions but also on methane emissions – analysis from our latest World Energy Outlook

shows that eliminating methane leaks is one of the most cost-effective measures designed to provide drastic reductions to the emissions intensity of gas supply.

The development of large-scale carbon capture, utilization and storage (CCUS) capacity is an important enabler of a reduction in CO2 emissions and can be realized at relatively low cost – especially for upstream emissions – and could even be monetized or used for other activities such as enhanced oil recovery.

Diversification of the gas supply mix with a greater share of renewable gases, such as biomethane and hydrogen sourced from renewable sources, is another source of emissions reduction.

Will LNG become a fuel of transition or a true partner in the era of renewables?

The overall share of fossil fuels – oil, coal and gas – in global energy demand has not changed over the last 25 years and they remain central to today's global energy system. How they fare in the future will depend to a large extent on the level of policy ambition and technology innovation.

Each year in our World Energy Outlook report, the IEA analyses various different scenarios for the future of global energy. Gas consumption grows in every one of them, underpinned by its versatility and environmental advantages relative to other fossil fuels.

Even in our most ambitious Sustainable Development Scenario, gas demand continues to grow to 2025 before flattening out. Gas is the only fossil fuel for which demand in 2040 is higher than today, and it is set to become the largest fuel in the global energy mix.

Reshaping flows

Growing US exports and spot liquidity are reinforcing global trade interconnectivity and efficiency, but a possible supply shortage in the early 2020s could have far-reaching implications.



Harry Weber
Senior Natural Gas Writer

The shift from point-to-point LNG deliveries to a liberalized market where cargoes are free to cut a path to the best netback will be cemented by global export infrastructure developments that are opening up new trade flow routes.

The main drivers? Flexible US supplies and expansions by Qatar and Russia that offer greater efficiency to buyers and sellers.

With some 208 million mt/year of liquefaction capacity to be added over the next two decades to the current global total of almost 400 million mt/year, based on S&P Global Platts Analytics forecasts, there will be a surge in spot trading that will incentivize greater optimizations across supply chains, resulting in an overall reduction in voyage lengths and final delivered costs.

National oil companies and big international oil companies, which are driving the majority of new LNG project finance, see liquefaction facilities as a crucial outlet for burgeoning associated gas production. A “producer push” on the scale expected would further pressure traditional trading patterns and drive increased commoditization of LNG globally.

The massive shift of US LNG diverting from Asia to Europe in winter 2018 was an indication of the impact price volatility will have in the future on cargo movements. During that period, Platts JKM, the benchmark price for spot LNG delivered to

Northeast Asia, dropped below the prevailing Western European benchmarks on a netback basis to US supply hubs.

Capturing market share

While flexible volumes from a second wave of US export projects will continue to lead the push for international LNG trade liberalization, other exporting countries are looking to expand their market share and not give up so much ground to the US.

State-owned Qatar Petroleum is pushing ahead with a bold expansion plan to boost LNG output to 110 million mt/year by 2024 from 77 million mt/year in 2019.

The move will help Qatar support global supply flexibility — especially if projects in other countries are delayed or do not get built — at a time when emerging economies in China and India are driving up demand and Europe is importing more cargoes after years of stagnation.

While Australia faces headwinds on the liquefaction growth front, it believes the discovery of substantial shale gas resources in the Beetaloo sub-basin in its Northern Territory represents a longer-term opportunity for growth. Success would provide a further backstop to the threat of global supply shortages.

Anadarko’s Mozambique LNG project also offers promise, while Russia’s Gazprom and Novatek are



Ross Wyeno
*Team Lead, North American
Natural Gas Analytics*

being urged to develop an integrated LNG export strategy to spur growth.

Supply shortage risks

But what happens if the new supplies do not come online in the quantities that the market is expecting?

No longer is there fear of a supply glut during the period from around 2021 to 2024. Instead the market has the potential to tighten, with limited new supply expected to come online in the period.

The six liquefaction facilities that are part of the first wave of US facilities on the Gulf and Atlantic coasts are already baked in to the numbers.

What's uncertain is how many of the so-called second wave of US projects, the dozen or so facilities under active development, will be built. Most have struggled to secure long-term offtake agreements to support financing for construction. Whether they can secure financing is likely to have far-reaching implications for global trade flows.

Past success provided the enthusiasm for future US potential. Cheap feedgas from prolific shale basins, destination flexibility and Henry Hub-linked contracts have lured end-users, portfolio players and commodity traders in Asia, Europe and Latin America to the US in search of LNG for almost a decade.

Unprecedented supply flexibility from new facilities prompted physical spot and financial LNG trading to surge.

Driving this growth were the tolling and sales and purchase agreements signed with US LNG exporters, which allow for full destination flexibility. They were

also backed by competitive supply hubs ready to accept excess feedgas should LNG be kicked back into domestic markets in the event of falling global gas prices.

Platts Analytics estimates that as much as 60%-80% of US LNG was either swapped or sold on spot/short-term tender in 2018.

In a typical swap, a buyer will exchange an LNG cargo produced in one part of the world with LNG sourced from a location that is closer to where the buyer wants the cargo to be delivered. Such arrangements allow both parties to reduce shipping and logistics costs.

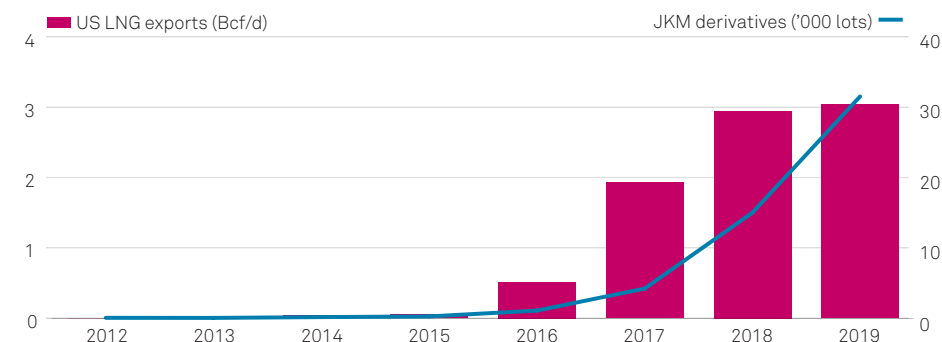
The growing ability for flexible North American supply to balance global markets is widely expected to increase the relationship between global LNG hubs and consolidate global gas prices toward the Henry Hub netback during periods of oversupply.

In addition to destination flexibility, US LNG export contracts generally feature cancellation clauses, which allow an offtaker to turn down monthly or even annual liquefaction volumes in the event that spreads drop below the variable cost of LNG production.

This turndown flexibility effectively ties the US gas-fired generation fleet into the global demand curve, allowing US power markets to absorb excess LNG feedgas supply and act as a backstop for global prices.

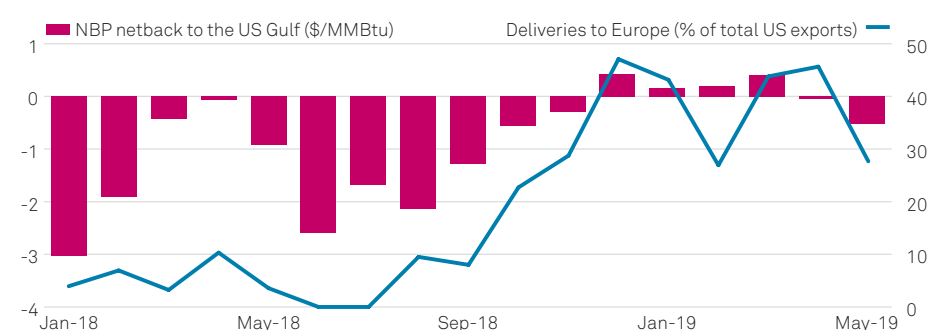
Overall, this relatively new type of LNG supply contract is able to reduce the overall commodity risk faced by the buyer and increase spot LNG trading optimization, while at the same time creating fertile ground for the development of risk markets.

GROWING US LNG EXPORTS ARE SUPPORTING THE DEVELOPMENT OF RISK MARKETS AND HELPING BOOST JKM SWAPS LIQUIDITY



Source: S&P Global Platts

MORE US LNG VOLUMES DIVERTED FROM EAST ASIA TO EUROPE AS NBP RISES ABOVE JKM ON A NETBACK BASIS TO THE US GULF



Source: S&P Global Platts Analytics

The staying power of these dynamics depends largely on what happens on the supply front.

Self-inflicted wounds have tested the US' mettle. The protracted trade battle between Washington and Beijing started with tariffs imposed by the US on Chinese products.

In response to one round of US tariffs, China — which is expected to become the world's biggest importer of LNG within a decade — imposed a 10% tariff on imports of US LNG in September 2018, which it then increased to 25% in May 2019.

The risks for investors in proposed liquefaction projects have

prompted some developers to change their business models, or consider alternative pricing mechanisms, to adapt. Canada and Mexico, both with ambitions to be significant liquefaction suppliers, are wildcards in the expected supply stack.

GO DEEPER

S&P Global Platts Analytics provides past, present and forward-looking analysis of LNG market fundamentals and price forecasts.

Get the insight at: spglobal.com/platts/en/products-services/lng/analytics

More than a balancer

With extensive regasification and storage capacity, flexible demand and well-connected, liquid trading hubs, Europe is establishing itself as more than just a global LNG balancer.



Samer Mosis
Senior LNG Analyst

The conversation around LNG in Europe has, in no uncertain terms, shifted.

Boasting over 100 Bcm of storage capacity, more than 20 LNG regasification terminals with over 220 Bcm/year of send-out capacity, a deep coal-to-gas switching channel, and well-connected, liquid trading hubs, Europe is steadily cementing a key role for itself in global LNG markets, one of global balancer, price anchor and demand hub in its own right.

Whereas the bulk of LNG contracts for delivery into Asia remain oil-indexed, in Europe a period of contract revisions starting in around 2007 meant gas — much of which was piped in from Russia and oil-indexed — has become increasingly hub-indexed.

By 2019, over 70% of Europe's gas supply is assumed to be linked to hub prices, primarily to the UK NBP or Dutch TTF, on a direct or hybrid basis, according to S&P Global Platts Analytics.

This connection to hub prices has fed liquidity on both the NBP and TTF, with the latter cementing itself as the primary hub for long-term gas indexation and hedging.

This has largely been driven by the TTF's location close to Europe's largest markets, proximity to both supply from Norway and the UK, and access to

significant storage facilities, all of which are accessible to the majority of market participants.

Reflecting these dynamics, the TTF's churn rate — the number of times a unit of gas is financially transacted before delivery — has consistently fluctuated between 25 and 70, depending on the contract month.

While this is on the whole lower than the annual churn rate of the US Henry Hub of more than 55, no index representing either LNG or pipeline gas in Asia has achieved a churn rate of above one yet.

That said, starting in 2018, JKM's churn rate has been accelerating, averaging just under 0.3 in 2018, and breaching 0.5 in various single months in the first half of 2019.

For now though, the TTF remains the most readily applicable financial tool in the global gas market to hedge against financial and physical price exposure, reflecting the downside risk for LNG price dynamics more accurately than Henry Hub or oil, especially in times of oversupply.

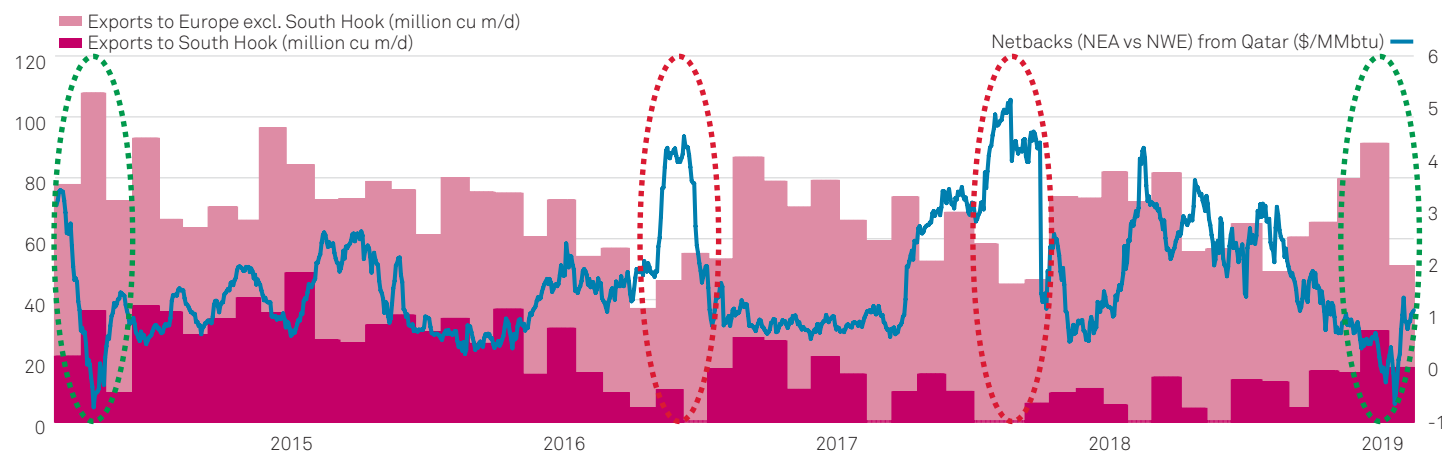
A 'put option' at play

Europe's extensive regasification capacity, storage space, flexible demand and liquid trading options also make it the global LNG market's natural



Lucie Roux
Senior Writer, LNG News and Analysis

QATAR INCREASES SOUTH HOOK UTILIZATION AT TIMES OF WEAK NORTH EAST ASIAN PRICES AND VICE-VERSA



Source: S&P Global Platts Analytics

“put option”, because of its ability to absorb surplus volumes in times of oversupply.

This dynamic was clearly at play in Winter 2015 and Winter 2018 — both periods of weak LNG demand.

In Winter 2018, markets in northwest Europe (UK, France, Belgium, Netherlands) imported roughly 28 Bcm (around 150 million cu m/d), equating to a regional capacity utilization of nearly 50%, its highest level in the modern LNG era, Platts Analytics data shows.

Underlining this connection between global LNG and European gas, the price correlation between JKM and TTF was a nearly perfect 1:1 through Winter 2018, while the relationship each benchmark held with oil fell below negative 0.2.

This clearly demonstrated Europe’s ability to efficiently absorb and disperse LNG at times of market glut and led to all of Europe’s “put option” components being brought into play.

Storage was driven to record levels and hub liquidity skyrocketed, even in traditionally less liquid southern European hubs like Spain’s PVB and Italy’s PSV where price transparency and infrastructure accessibility remain more opaque.

Many LNG players with market length already use Europe as their financial and physical balancer.

An example of how this “put option” functions practically can be seen in the case of Qatar, which utilizes its ownership stake in the UK’s South Hook regasification terminal to secure capacity for its marginal, swing cargoes when Asian demand is too weak to absorb incremental flows.

Using JKM as a proxy for Asian demand, Platts Analytics data shows that when Qatar’s netbacks to JKM fall below that of TTF, Qatari exports to South Hook surge, while conversely, in times of a notable JKM premium to TTF, Qatar’s exports to South Hook dry up.

LNG in Europe: baseload?

Looking forward, the European market is set to transform from just a balancer into a demand center in its own right.

Five years ago, before concern deepened around the decline in output from Europe’s largest gas field Groningen and the Norwegian Continental Shelf, it was largely expected that LNG would be on the margin of European supply.

While logical at the time, since then European markets have developed differently.

Domestic production is now expected to decrease much more quickly than originally thought, with steeper declines in the near term resulting in LNG taking on a much larger part of the supply stack.

Today, LNG is viewed as a core part of the European gas mix, critical to meeting long-term demand alongside Russian pipeline supplies.



After a period of relative tightness in 2021-2024, the global LNG market could become oversupplied again from 2024 and into 2025.

This is expected to raise the share of LNG in Europe's supply stack to 13%, around 20 Bcm/year stronger than levels in 2018, according to Platts Analytics.

While some of this will be a push of LNG into Europe, the region will also be exhibiting some pull on global LNG as domestic production falls by as much as 35 Bcm/year relative to 2018 levels and Europe looks externally to fill that space, something Russian pipeline gas cannot do alone.

The importance of Europe as a demand hub has been recognized by new liquefaction projects, with most of Mozambique LNG's contracts having some elements of European hub indexation and built-in flexibility allowing arbitrage between Asian and European markets.

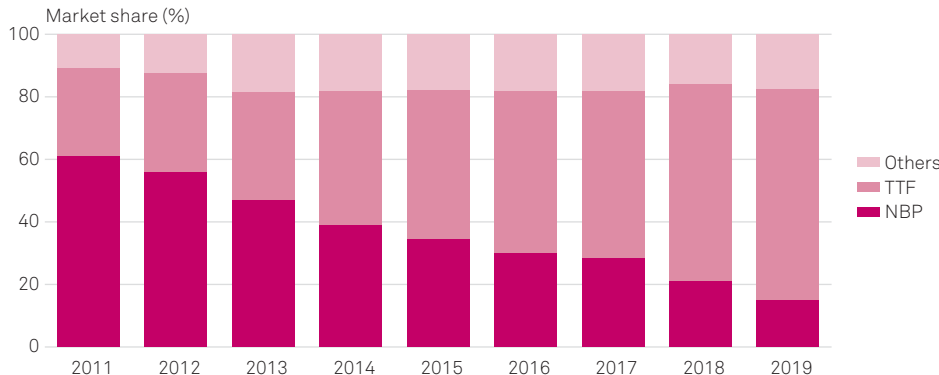
This not only underlines East Africa's natural geographic advantage, equidistant from key European and Asian markets, but also reflects the expanding role LNG is expected to take in the European supply stack more broadly.

Politics not economics

Outside the traditional LNG markets in northwest Europe, LNG demand is also set to grow through a series of new LNG import facilities where political, not just economic, calculations have been a key driving force.

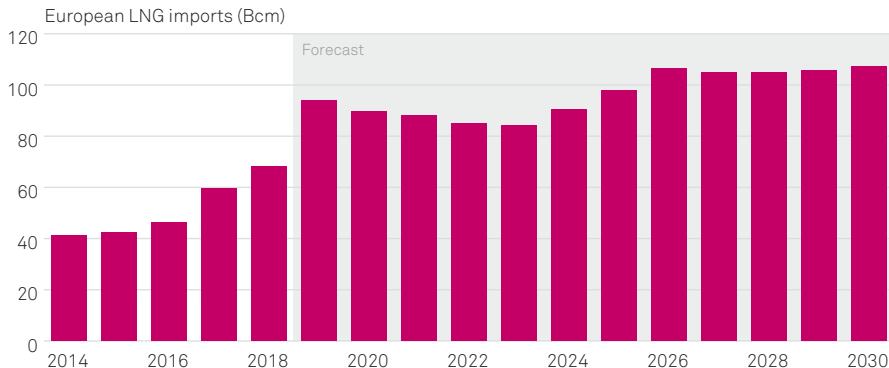
One country currently struggling to reconcile economic and political considerations is Germany. Europe's

TTF'S SHARE OF OTC MARKET GROWS FURTHER, CEMENTING ITS ROLE AS PRIMARY HUB FOR LNG PRICE INDEXATION AND HEDGING



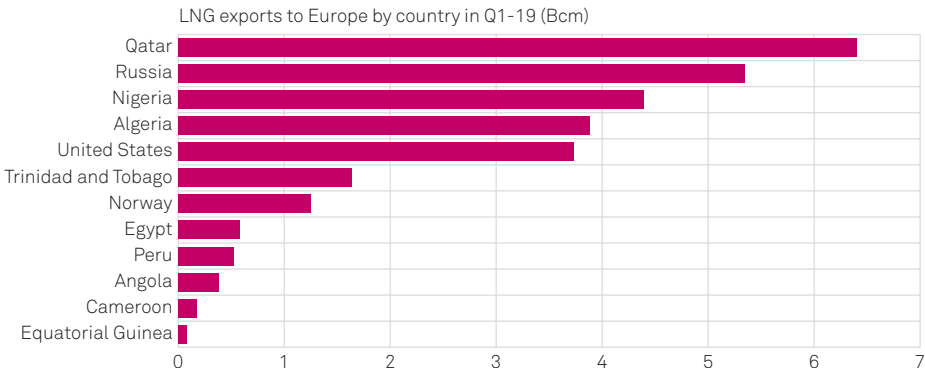
Source: S&P Global Platts Analytics, LEBA

EUROPE RISES AS GLOBAL LNG DEMAND CENTER AS DOMESTIC PRODUCTION DECLINES AND COAL IS PHASED OUT FROM ENERGY MIX



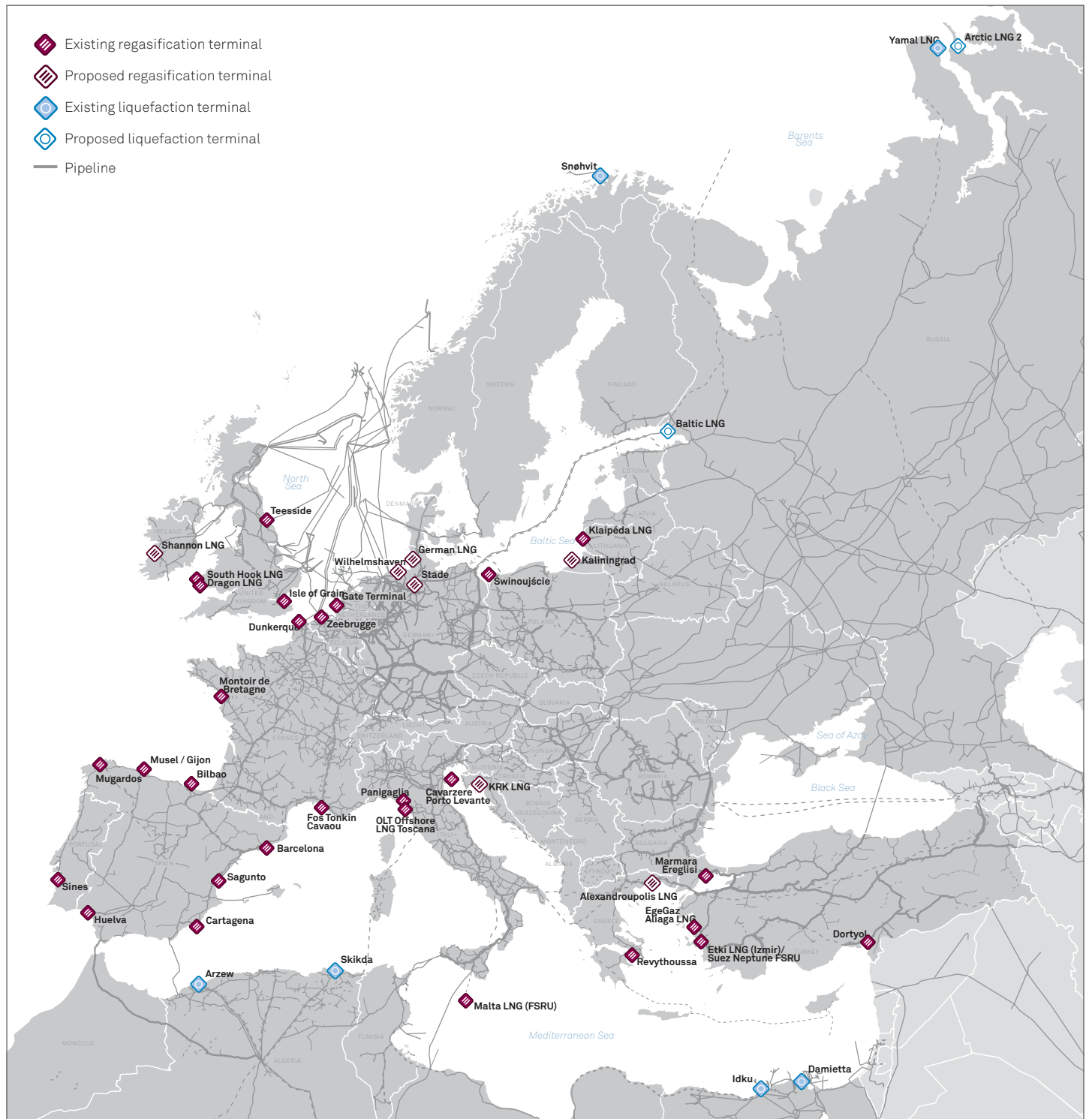
Source: S&P Global Platts Analytics

RUSSIA STEADILY RISING IN THE RANKS OF EUROPEAN LNG SUPPLIERS, A TREND LIKELY TO PERSIST



Source: S&P Global Platts Analytics

EUROPE BALANCING GLOBAL MARKETS THROUGH EXTENSIVE IMPORT, STORAGE AND DISTRIBUTION FACILITIES



Source: S&P Global Platts

biggest gas consumer with demand at around 90 Bcm/year, Germany has found itself in the middle of conflicting political interests, with the US and Russia pulling on either side and even Qatar making a play to impact Germany's gas supply.

The German government has put its weight behind the launch of at least one LNG import facility in the country. Platts Analytics expects a financial investment decision at one of the proposed projects by the first half of 2020.

Other smaller terminals have also received political funds or support from the EU, which wants to secure more diversified supply sources.

In particular, within the framework of the Connecting Europe Facility (CEF) for energy infrastructure, the EU has awarded two grants of Eur100 million each for the construction of the Krk LNG terminal in Croatia and the Cyprus LNG terminal.

The EU has also provided some initial support for four other LNG projects:

- the Shannon LNG terminal in Ireland;
- the Alexandroupolis terminal in Greece;
- the Gothenburg LNG terminal in Sweden;
- and a capacity extension of the Swinoujscie plant in Poland.

European markets present global gas markets with many challenges, but seemingly more opportunities. A tighter domestic balance across Europe in the next decade calls for new, flexible approaches to meeting gas demand. Coincidentally, this arises as global LNG markets seek new baseload demand for burgeoning supply length in the US, the Middle East and Africa.

As markets continue to evolve, the need for accurate benchmarks for contract indexation will increasingly put a spotlight on European hubs, which enjoy the benefits of decades of evolution.

Together, these dynamics have the potential to provide a home to global supply in both on- and off-peak periods while simultaneously meeting Europe's needs for energy security and diversification.



“Europe is steadily cementing a key role for itself in global LNG markets, one of global balancer, price anchor and demand hub in its own right.”

Opening up

Gas market liberalization in Japan is helping pave the way for other countries in Asia to follow suit. More players means more liquidity, as the lines between buyers and sellers blur.



Shi Yun Fan
Associate Editor, LNG

Demand growth in the global LNG market will hinge not only on new infrastructure and growing economies, but will also require an influx of additional buyers entering the market in search of clean, reliable and affordable energy.

Nowhere else is this more true than in Asia where steps have already been made to open up markets, add new participants and promote price discovery.

However, demand prospects are very different in the established Northeast Asian market compared with the emerging economies in south and southeast Asia.

Competing fuels, energy efficiency and infrastructure constraints all play a role in dampening the outlook for demand in Northeast Asia.

China, though, is set to continue to see strong LNG import demand growth given supportive government policy and could well overtake Japan as the world's biggest LNG importer in the early-to-mid-2020s.

Other established buyers such as Pakistan, Bangladesh, India and Thailand will help prop up demand across the rest of Asia as they look to grow total power generation, industrial end-use and transportation demand while building out infrastructure to support LNG.

And emerging buyers elsewhere in Asia — countries such as Sri Lanka, Vietnam and the Philippines looking for a reliable source of energy supply to help support their growing economies and in some cases replace diminishing domestic supplies — will help fuel the next wave of LNG importers.

Legacy buyers

The traditional markets of Japan, South Korea, Taiwan and China represent over 55% of global LNG demand. But shifts in the profiles of these large buyers are likely in the coming years.

Japan, in particular, has traditionally been the driver of much of global LNG consumption, though the country's recent market liberalization has prompted the relaxation of destination clauses in LNG supply contracts, revolutionizing the role of Japan as a traditional buyer.

With a steady rate in the return of the country's nuclear fleet post-Fukushima over the next three years, Japan could also see a gradual reduction in its LNG imports.

Nine nuclear power plants have come back online as of 2019, with 14 more expected in the next few years, sparking a significant shift in demand away from the more expensive LNG.



Jeffrey Moore
Manager, Asia LNG Analytics

As a result, S&P Global Platts Analytics estimates the issue of over-contracting to emerge this year among Japanese utilities, while the situation could peak in 2020, with the over-contracted volumes reaching 19.5 million mt.

While it used to be that Japan was heavily geared toward LNG supply security in a post-Fukushima world, now the buzzword is increasingly “flexibility” given its importance to dealing with downstream demand fluctuations amid growing fuel-on-fuel competition.

South Korea, meanwhile, shares a similar story to Japan, albeit with competition coming to a larger extent from coal and renewables.

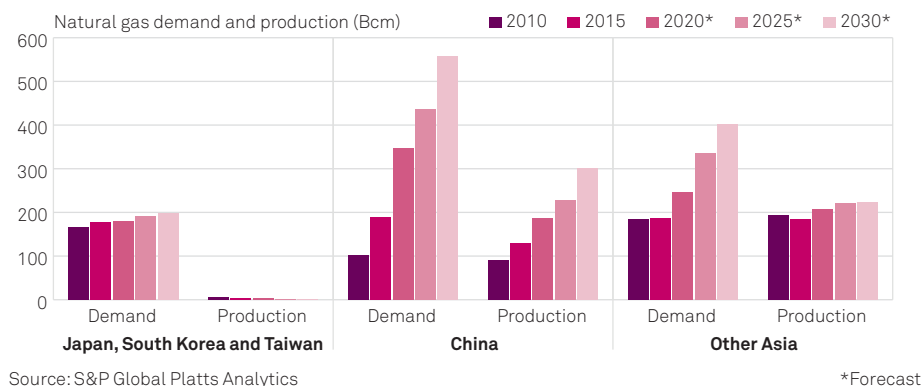
Seoul wants by 2030 to increase the share of gas in its energy mix from 17% in 2017 to 19%, while the share of renewable energy is targeted to rise from just 5% to 20%. Coal, by contrast, is set to see its share of the country’s energy mix drop from 45% to 36% in the same timeframe.

Liberalizing the country’s gas market would mean allowing new and independent entrants to procure from the international market, while reducing the monopolistic power of state-owned Korea Gas Corp.

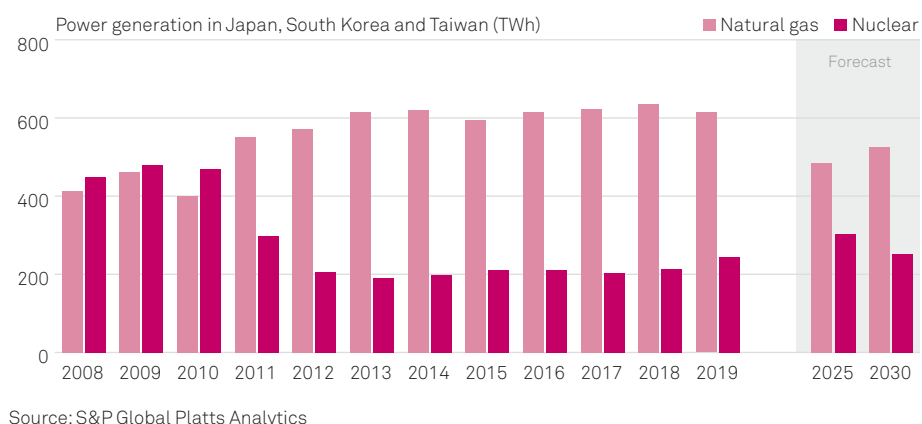
Opening up its receiving terminals to the downstream markets will also bring more price competitiveness.

Despite the decision to cut LNG taxes by 74% and raise coal taxes concurrently by 27% from April 1, the economics of buying LNG versus coal in South Korea still seem to favor the latter, not least given that new power generation capacity in recent years has been focused on coal rather than gas.

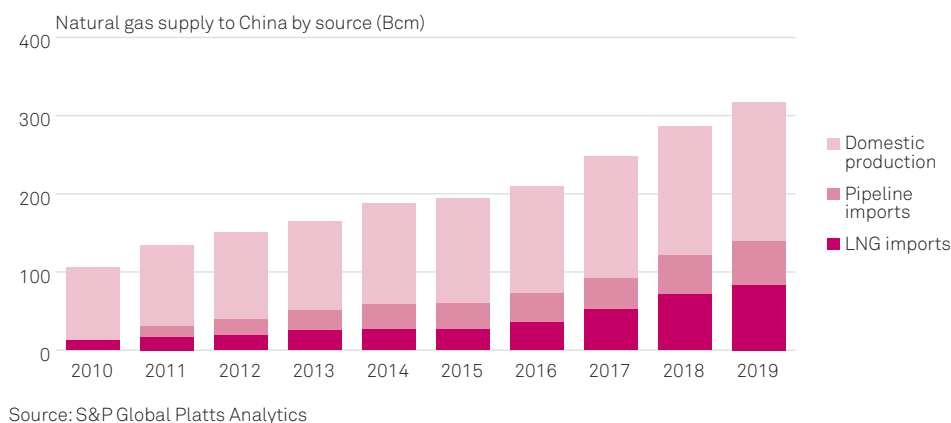
CHINA AND EMERGING ASIAN MARKETS: LNG'S BIGGEST DEMAND GROWTH OPPORTUNITY AS ECONOMIES EXPAND AND MARKETS LIBERALIZE



LIMITED DEMAND UPSIDE FROM LEGACY MARKETS OF NORTHEAST ASIA DUE TO MATURING ECONOMIES AND JAPAN'S NUCLEAR RESTARTS



CHINA, A KEY DRIVER OF GLOBAL LNG DEMAND GROWTH AS DOMESTIC OUTPUT AND PIPELINE IMPORTS CANNOT KEEP UP WITH CONSUMPTION



Chinese growth

Of all the traditional importers in Northeast Asia, China's LNG demand paints the most promising growth picture. The country's growing appetite for LNG has been on an irreversible upward path since 2017 against the backdrop of supportive government policy on coal-to-gas switching, an attempt to combat nationwide air pollution.

Third-party access to LNG terminals owned by China's national oil companies as part of a market liberalization initiative has been in place since 2018, while state-planner NDRC is also supporting infrastructure development projects by independent gas distributors and power utilities through the approval of new terminals, storage tanks and import capacity.

Market reforms are opening up the floodgates, creating additional demand

that was previously held back by infrastructure constraints and the monopoly power of China's state-owned oil and gas companies.

With at least seven new import terminals planned for startup by 2022 — as well as the expansion of existing sites — over 20 million mt/year of receiving capacity could be added, increasing the number of independent buyers from the current eight.

This will free up access to the more fragmented and market-oriented downstream gas and trucked LNG sectors.

Platts Analytics forecasts China to overtake Japan as the world's largest LNG importer in the early-to-mid 2020s, with total imports at more than 80 million mt in 2024, a 57% increase from 51.2 million mt in 2018.

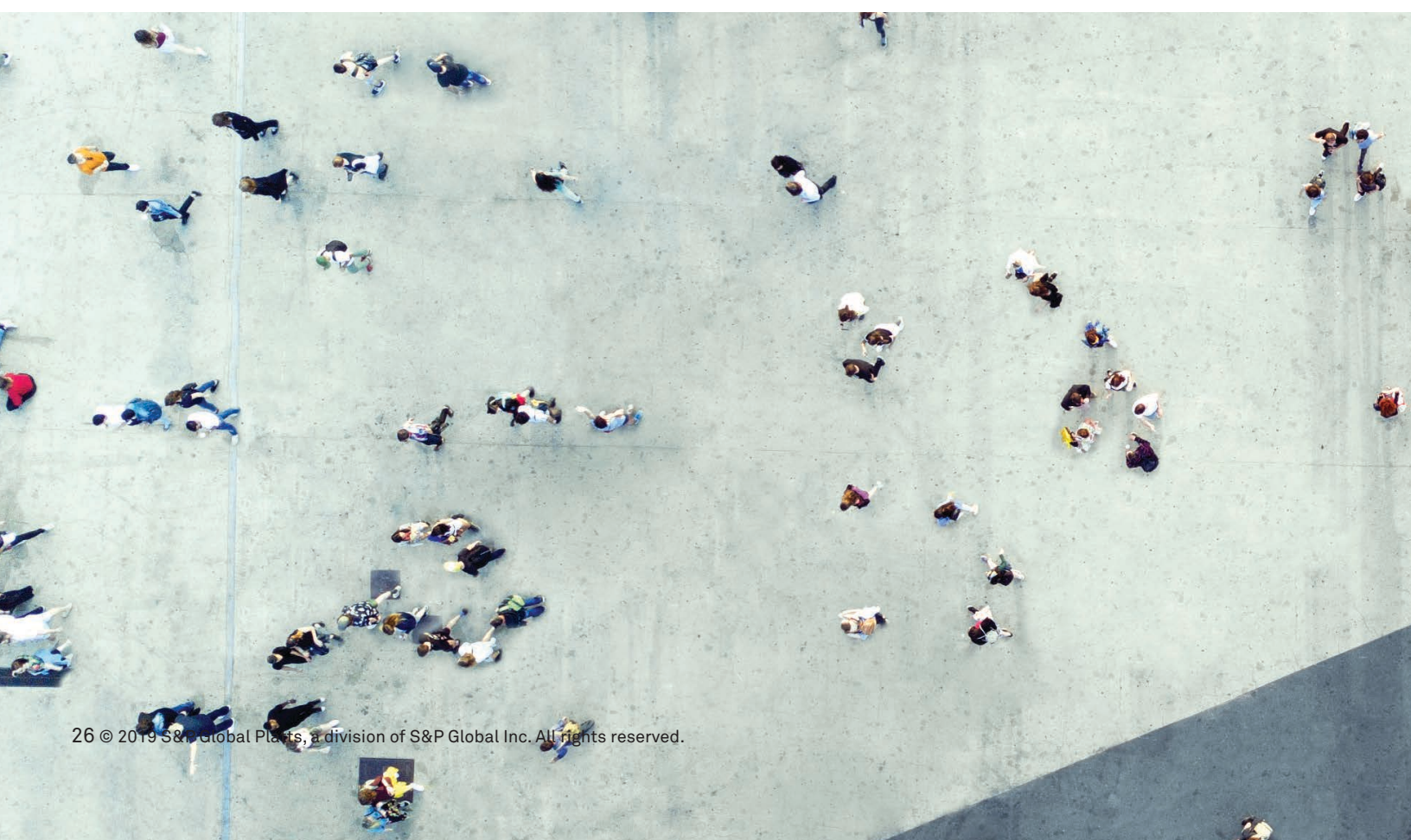
Emerging buyers

Away from Northeast Asia, the region with the most opportunity for a significant increase in LNG purchases is within emerging Asia.

Many countries that currently import LNG are looking to established energy economies in Europe and North America for guidance on market liberalization, and as more and more countries enter the global LNG market, this trend should help spur demand and increase the total number of players within the region.

This will lead to a strengthening of LNG commoditization and increase the opportunity for spot trading.

Emerging economies are seeing increased energy intensity, growing populations and a desire for relatively



inexpensive and environmentally-friendly options to support energy demand growth.

The potential market for LNG outside of the established buyers in Northeast Asia is significant, and Platts Analytics expects LNG demand from this market to reach roughly 130 million mt/year by 2030, up 42 million mt from 2018 levels.

Furthermore, because many of these countries already have established gas markets, the prospect of declining domestic supplies should continue to support the market for LNG.

Countries across Southeast Asia — such as Malaysia and Thailand — will also soon allow end-users access to import terminals, which in turn means more buyers with a diverse set of procurement needs out in the market looking for supplies.

This could easily spread to other less established markets by the end of the next decade.

The biggest obstacle to continuing to integrate LNG and spur strong growth will likely be surrounding the ability to implement infrastructure economically.

As the number of buyers increases and the fragmentation in buyers emerges, the literal fragmentation around the geography in southeast Asia will also become apparent. Buyers will need to invest in significant infrastructure to get volumes to sparse and spread out end-users.

The very reason that LNG is a viable option for much of southeast Asia — that it can access a wide variety of markets with a diverse set of supplies — could become its biggest hurdle to overcome as buyers will

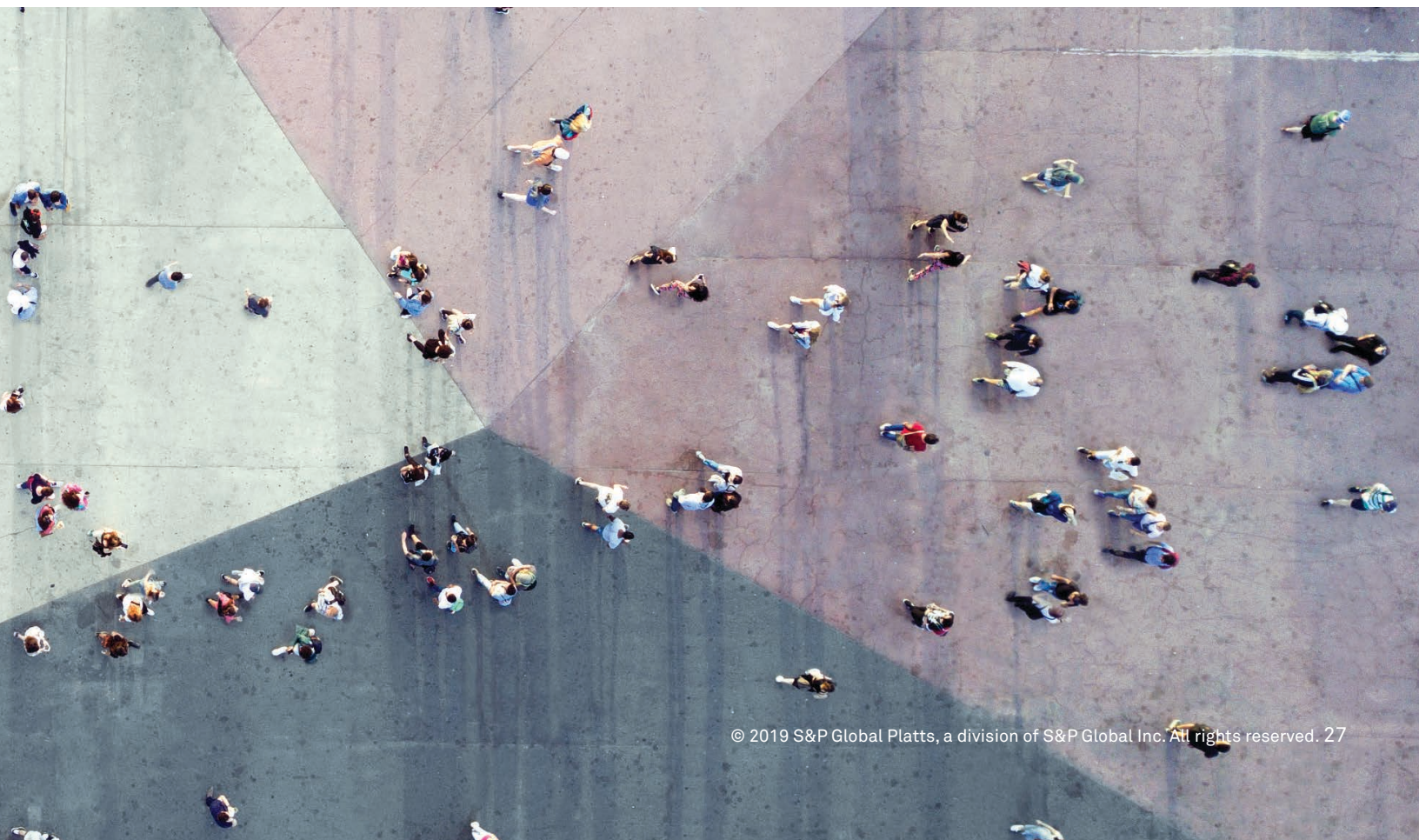
need to look for economically viable options, especially to compete with other forms of energy supply such as renewables or coal.

LNG will need to prove itself as a flexible, affordable fuel in which buyers can have confidence. Increasing competition and the diversification of buyers will help drive the market forward over the next decade, opening up the potential for regional hubs and new pricing points.

GO DEEPER

S&P Global Platts JKM global LNG benchmark represents the daily tradable price of spot LNG cargoes delivered into Northeast Asia.

Get the price at:
spglobal.com/platts/en/products-services/lng/services



Getting imaginative

Second-wave LNG developers are embracing new kinds of financing and contract models that will support both growing spot trade and a secondary, small-volume contract market.



J Robinson

Senior Writer, Americas Natural Gas

A growing number of second-wave LNG developers targeting startup dates in the early- to mid-2020s have been struggling to reach final investment decisions in recent years. A select few of the higher-capitalized projects have crossed the finish line.

Others are facing headwinds in securing adequate funding, calling into question the viability of projects that will be essential in meeting the anticipated growth in global LNG demand.

According to S&P Global Platts Analytics, LNG supply is expected to grow to almost 400 million mt/year by 2023, up from 320 million mt in 2018.

The market has witnessed a decisive shift in bargaining power toward buyers since the mid-2010s. The growth in flexible supply from the US

and Australia has given end-users, utilities and portfolio players the leverage to exact shorter, more flexible buying arrangements.

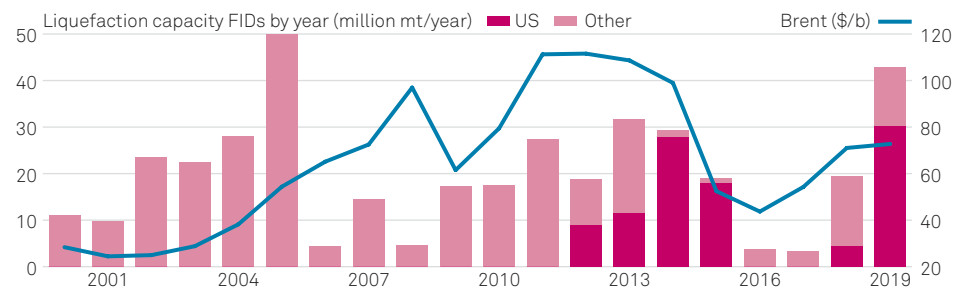
As traditional LNG contracts, underpinned by long-term sales and purchase agreements (SPAs), become a relic of the past, second-wave developers are embracing innovative financing and contract models to reach FID. Those new models will change how LNG trades in the future.

New strategies to reach FID

For a select group of highly capitalized LNG developers, firm offtake contracts are no longer a prerequisite for FID.

This development marks a sharp break with the past.

NEW CONTRACTING AND FINANCING SOLUTIONS, HIGHER PRICES SUCCEED IN ACCELERATING THE PACE OF EXPORT PROJECT FIDS IN 2019



2019 data above only considers January – June 2019.

2019 FID includes Golden Pass, Calcasieu Pass, Sabine T6 and Mozambique LNG.

Source: S&P Global Platts Analytics

The acceleration of LNG trade in late 1990s and early 2000s was propelled by large-scale export projects built using borrowed capital tied to long-term SPAs.

These agreements required buyers to commit to long-term contracts that often included destination restrictions and even prohibited the resale or time swapping of cargoes.

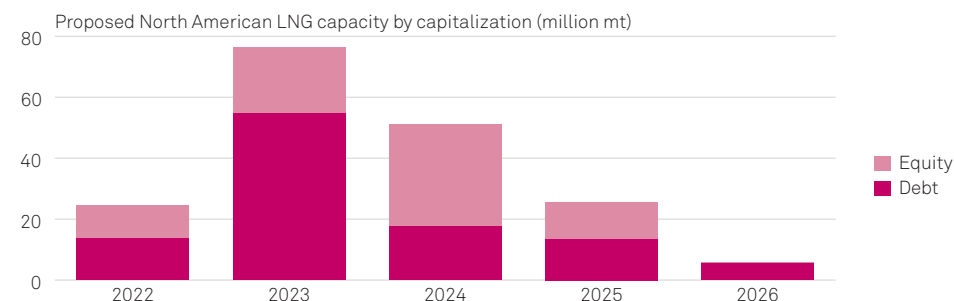
With the startup of exports from Australia and the US Gulf over the past few years, more liquidity has emerged in global LNG trade. Particularly for those with portfolio trading experience, the increase in short-term and spot market transactions has helped build confidence that new export projects can be successfully launched without significant debt financing and firm SPAs.

Since late 2018, the equity from deep-pocketed global majors, national oil companies and portfolio players has brought LNG Canada and Golden Pass — both large-scale North American export projects of 14 million mt/year and 16 million mt/year, respectively — into their construction and redevelopment phases.

For other equity-fueled projects, like the Shell and Energy Transfer backed 16.5 million mt/year Lake Charles facility, an FID is likely forthcoming soon too, regardless of any prior contracting activity.

For developers like Tellurian, however, the road to FID for its 26 million mt/year Driftwood LNG facility has been a bumpier one. In addition to intricate equity offerings, the project will likely be supported in part by smaller volume offtake agreements and significant debt.

EQUITY-FUELED PROJECTS LED BY MAJORS, NOCs MORE LIKELY TO REACH FID REGARDLESS OF PRIOR CONTRACTING ACTIVITY



Note: Capacity estimates include projects that are at various stages of development ranging from pre-FID to those currently under construction
Source: S&P Global Platts

In April, Tellurian announced its first successful \$500 million equity investment from France's Total. Beyond the partial ownership sale, the developer offered attractive contract terms including a destination market price linkage to Platts JKM and an option that allows Total to take or leave up to 1 million mt/year from the Driftwood LNG terminal.

Tellurian's equity offering also gives investor-offtakers access to its gas resource in the Haynesville shale as well as midstream capacity from regional producing fields, including the Permian Basin.

Although the deal gives Tellurian a firm SPA from Total for 1.5 million mt/year, much more will be needed for the project to reach FID.

For an increasingly crowded field of low-capitalized developers, equity partnerships and offtake agreements from large portfolio traders remain elusive. For these projects, only smaller-volume and risk-averse buyers, and potentially less creditworthy buyers, are likely to sign the long-term contracts required to meet the lender's stringent requirements for debt financing.

Trading in the 2020s: spot vs contract

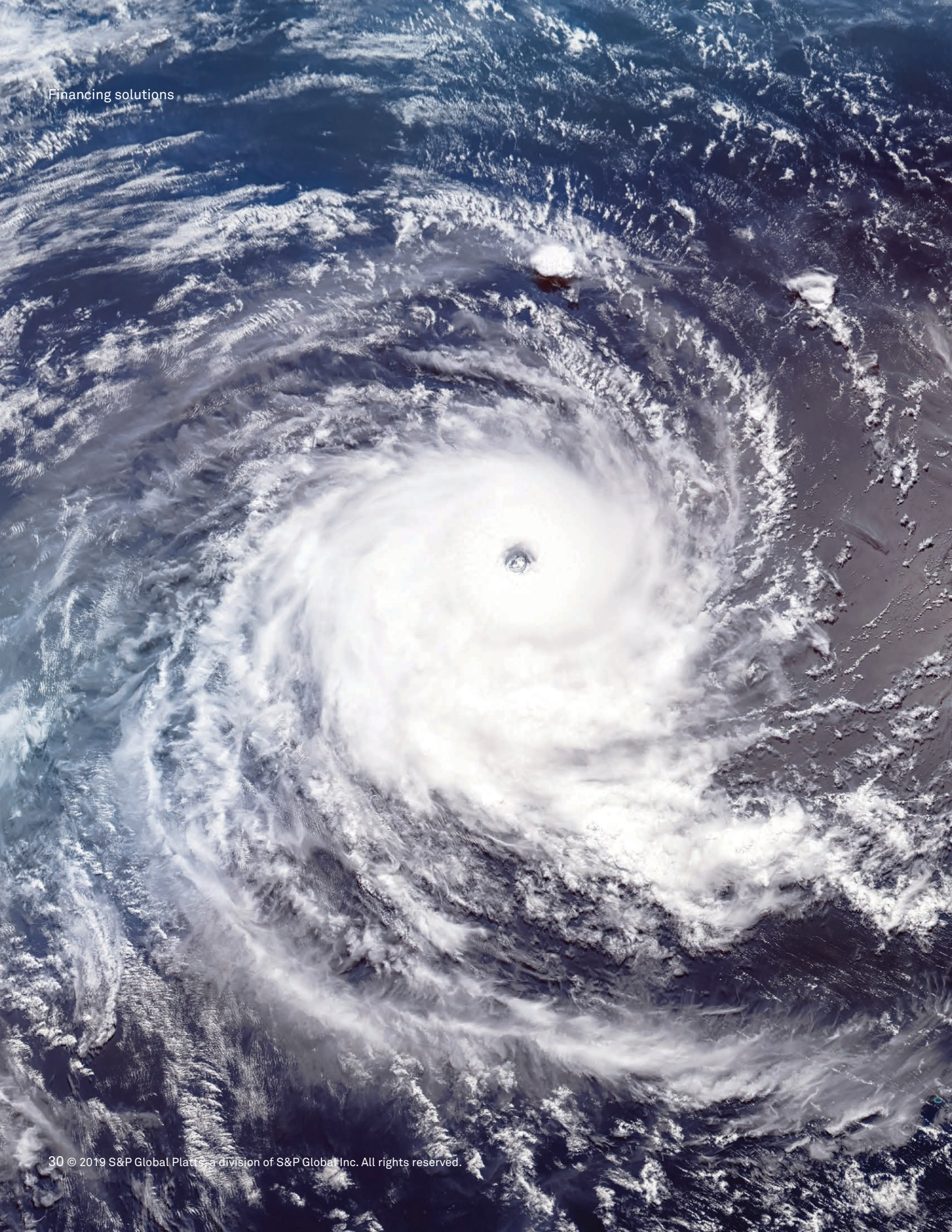
The emergence of equity-funded and portfolio-sponsored LNG export projects will continue to drive ongoing and much-anticipated growth in short-term and spot market trade.

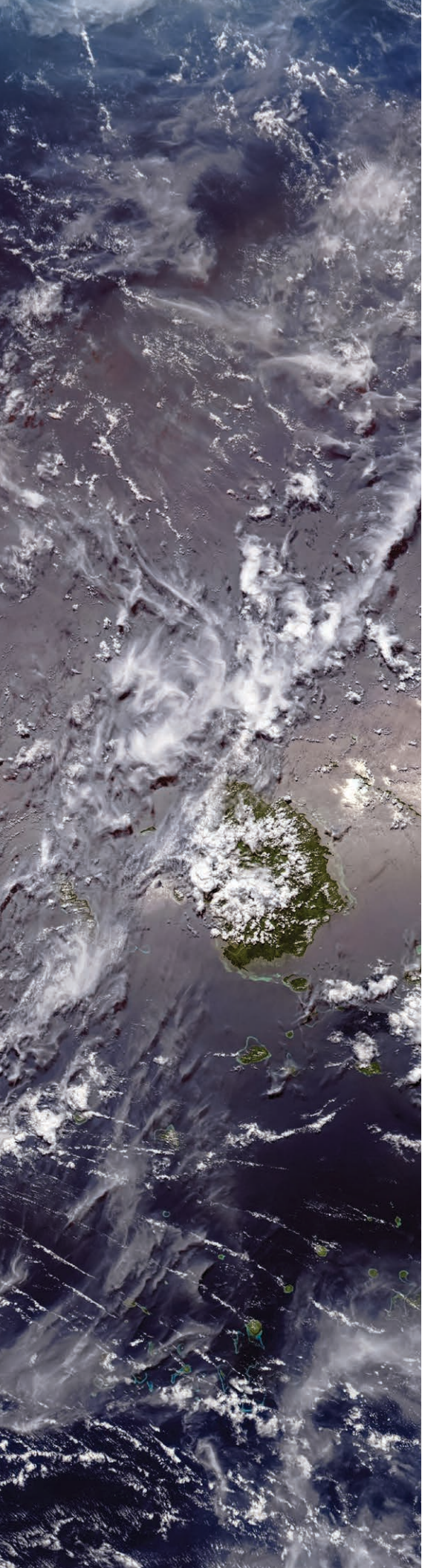
As independents and small-scale developers continue to gain traction, though, the SPAs required to sponsor debt-financed construction of sub-10 million mt/year projects will also help to sustain a secondary, but vibrant, contract market well into the 2020s.

As the volume of contracted LNG held by portfolio players has continued to grow, these global aggregators have become a major force in LNG trade, helping to meet buyers' demands for shorter contract horizons, smaller volumes and even seasonally weighted deliveries.

By the early 2020s, the startup of equity-financed projects will bring even more flexible LNG supply to the market, supporting the trend toward commoditization that has allowed LNG to trade, increasingly, like crude oil.

As the market share of portfolio players continues to grow, though, utilities and





end-users with lower risk tolerance, perhaps alongside buyers with lower credit ratings, will continue to have an appetite for smaller volumes packaged within medium- to long-term contracts that offer price-linkage diversity.

This outcome seems especially likely in Asia, where utilities in countries like Japan and South Korea are well known for risk aversion with a preference for supplier and diversity of price indexation.

For around a half dozen proposed US LNG projects ranging in size from 1 million mt/year to about 9 million mt/year, debt-financed construction could be supported by small-volume SPAs with these end-users that include prices indexed to LNG, gas, crude and even coal, as recently seen under the supply contract signed by Shell and Tokyo Gas.

These kinds of deals should continue to support material market share for the small-volume contract trade through the 2020s, the aggregate volume of which should not be underestimated.

Financing, contracts and price volatility

The new financing and contract models now being tested by second-wave US LNG developers could inject more price volatility into the global LNG market heading into the 2020s.

For equity-backed projects, offtakers with ownership in regional gas resources and midstream capacity should have access to significantly lower-cost feedgas supply.

According to Tellurian, its equity offering should give offtakers access to LNG at a fully loaded FOB cargo cost of \$3.50-\$4.50/MMBtu.

By comparison, first-wave LNG developers are currently supplying offtakers at a fully loaded cargo cost above \$6/MMBtu, according to Platts Analytics.

Access for US offtakers to cheaper supply will not only make the LNG market more competitive globally, but will also lower the threshold at which flexible supply shuts in, based on economic considerations.

New contract models are another factor that could increase price volatility in the 2020s. Destination-market price linkages in particular, like the JKM linkage offered by Tellurian and the coal-price linkage negotiated by Shell and Tokyo Gas, seem most likely to drive additional volatility.

Under existing Henry Hub-linked contracts used by US LNG pioneer Cheniere, and even the tolling models used by other US developers, fluctuations in the price of the producer's gas resource have the potential to make LNG exports uneconomic. Last winter, a precipitous spike in Henry Hub prices to the upper-\$4/MMBtu range, combined with record shipping rates, briefly put many US LNG offtake contracts out of the money.

Under some of the newly proposed destination-market price linkages, contracted volumes could continue to pressure the spot market, even as the cost of feedgas from the supply source rises.

For contracts linked to crude oil prices, this has also been the case historically. In late 2014, for example, falling crude prices contributed at least in part to weaker spot prices for LNG. At the time, cheaper oil-linked contracts prompted many buyers to exercise upward tolerance on these contracts. As spot-market LNG buying retreated, so too did prices.

Rising to the challenge

The LNG shipping market and the technologies associated with it are evolving, offering traders a greater ability to capture optionality and arbitrage opportunities.



Eric Yep

Senior Editor, Asia Energy News

The global LNG shipping fleet plays a vital role in the evolution of the LNG industry by allowing market participants to capture optionality and arbitrage opportunities, the cornerstones of commoditization. In the next decade, the commercial and technological aspects of LNG shipping will develop further to make LNG trading more flexible.

The availability of LNG carriers on the spot market has been rising in recent years, and when spot rates teared the \$200,000/day mark in 2018, it triggered renewed interest in shipowners to make speculative LNG vessel orders not linked to long-term supply contracts.

LNG newbuilds are seeing shorter time-charters of around seven years compared with up to 15 years previously, according to shipbrokers. A

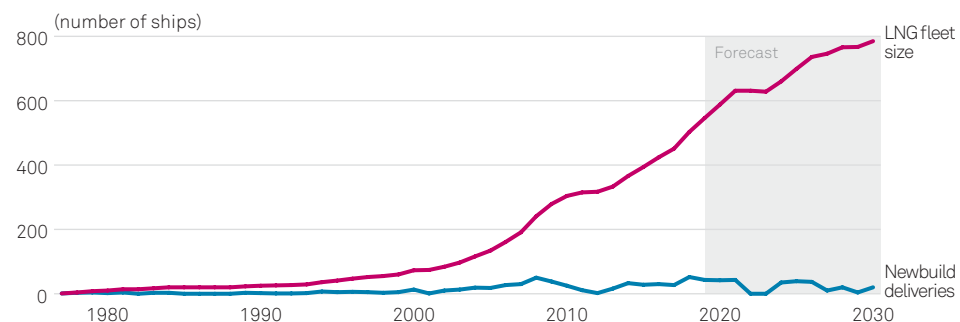
couple of decades ago, LNG carriers would not be built unless tied to specific projects.

According to the International Gas Union, only around 52% of the orderbook was tied to a specific project or charterer at the end of 2018, leaving 56 carriers available for the spot market or to be chartered out on term business.

When LNG spot rates were languishing at under \$25,000/day in 2017, as much as 15% of the global LNG fleet was laid up, more than most shipping segments, as day rates were below the break-even level. An increase in day rates has pulled most of these LNG carriers back into the spot market.

Additionally, the large number of LNG carriers rolling off long-term contracts between 2020 and 2030 will

GLOBAL LNG CARRIER FLEET TO HIT 800 SHIPS BY THE END OF NEXT DECADE, AFTER CROSSING THE 500-VESSEL MARK IN 2018



Source: S&P Global Platts Analytics

be prime candidates for spot trades — if day rates are attractive — before they get scrapped due to old propulsion systems.

DNB Bank estimates that cumulative long-term contracts rolling off could reach 36% by 2025.

Ownership fragments, diversifies

Even LNG vessel ownership structures are changing fundamentally. New fleet owners range from Greek investors diversifying into LNG to oil majors, portfolio players and trading houses controlling more LNG tankers for trading purposes.

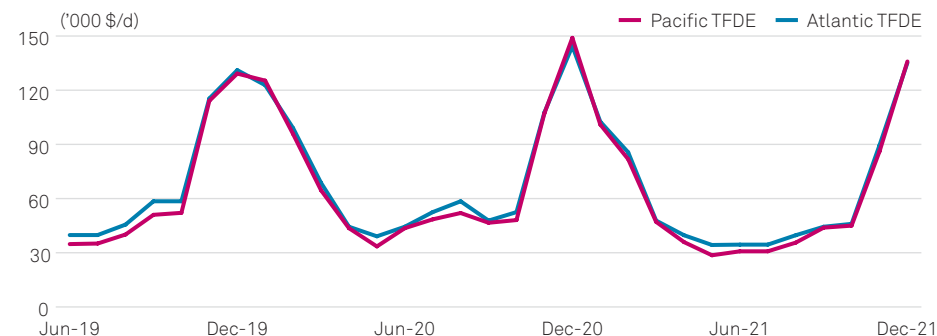
Data company VesselsValue estimates that Greek shipowners now own the highest valued LNG fleet in the world, worth \$18.4 billion by 2019, up from \$13 billion at the start of 2018, putting them ahead of Japanese shipowners, whose fleet value of \$15.2 billion was largely dedicated to project commitments.

These Greek shipowners include Marinakis Group, Minerva Maritime, TMS Cardiff, Alpha Gas and Thenamaris.

South Korea's Sinokor dominates the second-hand LNG carrier market, mostly for steam turbine vessels, and is among the top LNG fleet owners, while US LNG producer Cheniere has emerged as one of the largest LNG vessel charterers with as many as 25 ships on the water at the same time, according to company presentations.

Oil majors, portfolio players and commodity traders have become some of the most active short-term charterers of LNG vessels. For instance, Shell Trading & Shipping

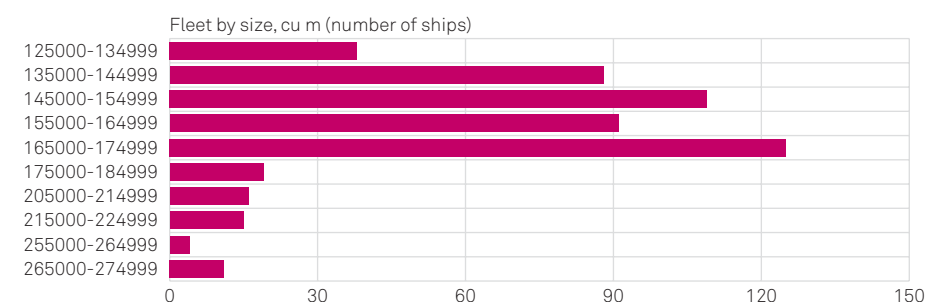
SPOT FREIGHT RATES FOR TFDE LNG CARRIERS TO REFLECT SEASONALITY AS VESSEL AVAILABILITY GROWS ALONGSIDE LNG VOLUMES



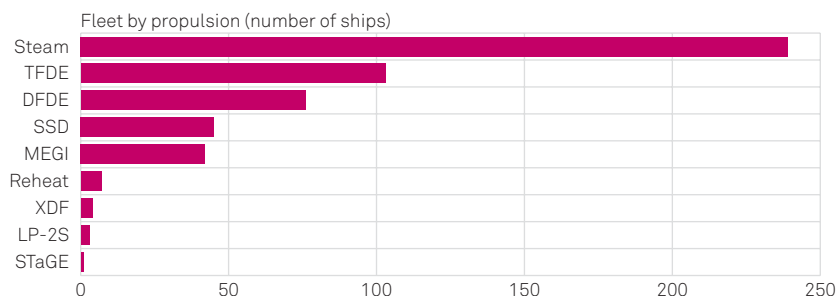
Source: S&P Global Platts Analytics

TFDE: Tri-fuel diesel electric propulsion

FLEET SIZE STANDARDIZES AT 135,000-175,000 cu m AFTER SEVERAL YEARS OF GROWTH, REFLECTING CAPACITY CONSTRAINTS AT PORTS



NEW LNG CARRIER PROPULSION TECHNOLOGIES LIKE MEGI AND TFDE ARE HELPING REDUCE BOIL OFF AND INCREASE FUEL EFFICIENCY



Source: S&P Global Platts Analytics

controlled nearly 52 LNG carriers between its time-chartered fleet, full-owned and partly owned vessels, accounting for nearly 10% of the current global fleet, VesselsValue data shows.

LNG role in global fleet

The size of the global LNG fleet crossed the 500 vessel mark in 2018 and is set to reach almost 800 ships by 2030, according to S&P Global Platts Analytics. As such,

Evolving fleet

LNG ships will account for an increasing portion of the global shipping fleet.

Gas carriers accounted for 8.8% of the world fleet in 2018 by dollar value of ships, and at 7.2% posted the fastest growth that year, according to the UNCTAD Review of Maritime Transport 2018. Between 2000 and 2018, world seaborne trade for gas more than tripled to 1.77 billion ton-miles from just 576 million ton-miles. Oil grew by less than 44% in the same period.

LNG ships are now evolving to also provide time arbitrage opportunities, in addition to the geographic arbitrage, by acting as floating storage. This is enabled by advances in LNG technologies.

A growing number of new LNG vessel orders and deliveries are shifting to

advanced MEGI (M-type Electronically controlled Gas Injection) and XDF ships, which have minimal boil off, allowing for longer storage without cargo losses.

On the spot market, the MEGI and XDF ships can command a premium of \$20,000/day over TFDE/DFDE vessels, which are in turn more fuel efficient than the old steam turbine LNG vessels. Spot charters of TFDE/DFDE vessels averaged \$85,500/day in 2018, compared with \$53,400/day for steam LNG vessels, according to the IGU.

Qatari expansion

LNG powerhouse Qatar is helping to drive the expansion of the global LNG shipping fleet. In April 2019, Qatar Petroleum kicked off a construction

plan for more than 100 new LNG carriers – with 60 to be delivered initially.

The investment is designed to support Qatar's liquefaction capacity expansion to 110 million mt/year by 2024 from 77 million mt/year now and the development of its Golden Pass terminal in the US.

While the bulk of these ships will be to support Qatar's long-term contracts on time charters, Qatar Petroleum has been increasingly active on the short-term market to remain competitive, and the fleet will find itself meeting flexible trading arrangements over time.

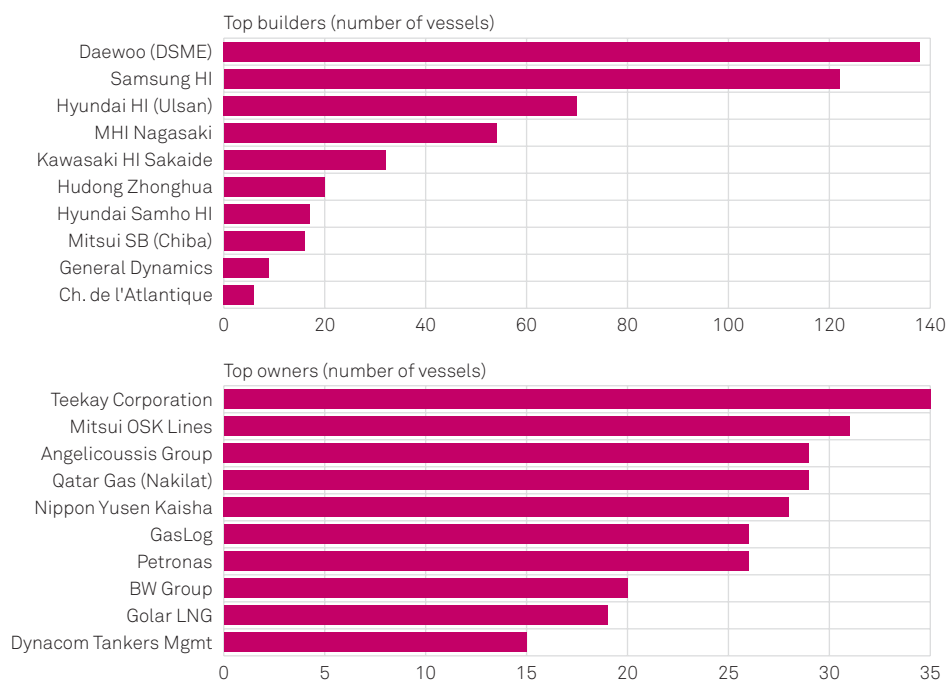
The shipping tender includes options for replacing Qatar Petroleum's existing LNG fleet. Nakilat, Qatar's national shipping company, has a fleet of 69 LNG ships comprising 24 conventional LNG ships, 31 Q-Flex and 14 Q-Max vessels, owned wholly or in joint venture, according to shipping consultancy Drewry.

The average age of these ships is 10 years, but by 2030 the average age of this fleet will be approximately 21 years, so some replacement is likely, Drewry said.

Older vessels are typically redeployed to the spot market or are converted to storage and floating terminals, before being scrapped, all of which adds to trading infrastructure. Moreover, Qatar's shipping fleet has set new standards for global LNG receiving infrastructure and ports, and innovations in its next fleet expansion will be critical for future LNG trading.

LNG shipping continues to evolve to accommodate Arctic shipping routes, expansions and limitations of the Panama Canal, reloads and diversions between the Atlantic and Pacific basins, and the use of LNG as a marine fuel, all of which will be critical to LNG commoditization in the next decade.

LNG VESSEL OWNERSHIP BECOMING MORE DIVERSIFIED, SOUTH KOREAN YARDS LEADING SHIPPING PRODUCTION AND TECHNOLOGY INNOVATION



Source: : S&P Global Platts Analytics

“LNG

shipping continues to evolve to accommodate seasonality of Arctic shipping route, expansions and limitations of the Panama Canal, reloads and diversions between the Atlantic and Pacific basins, and the use of LNG as a marine fuel, all of which will be critical to LNG commoditization in the next decade.”

Long story short

As LNG becomes increasingly commoditized, the era of long-term contracts is set to end — particularly as numerous agreements expire in the coming years.



Eric Yep

Senior Editor, Asia Energy News

Global LNG procurement trends are undoubtedly shifting toward shorter contracts with smaller volumes and increasingly flexible commercial terms.

With many long-term supply contracts set to roll off in the coming years, renewals are likely to be for shorter timeframes.

The traditional 15-20 year agreements that underpin LNG projects will be much harder to come by, and only long-term contracts by large core suppliers such as Qatar will continue to form the backbone of global LNG supply.

The contours of long-term contracting activity will also change, with sellers capitulating on most major contractual conditions like destination flexibility, resale rights, price indexation, take-or-pay clauses, and volume flexibility.

On the supply side, new liquefaction capacity and offtake is also shifting towards portfolio players with deep pockets, including oil majors and trading houses, which means that a large number of project sponsors no longer need long-term contracts to obtain project finance.

For buyers, a supply-driven market will further reduce appetite for long-term contracting, at a time when demand projections are constrained by market uncertainties, the emergence of competitive fuel sources and geopolitics.

With the primary drivers behind long-term LNG contracts eliminated — financing for projects and security of supply for consumers — the need for long-term contracting in the future is significantly diminished.

The future LNG market “will be a mix of short-term/spot contracts, 5-10 year deals with a few 20-year contracts, along with portfolio player projects with no contracts aside from the equity partners themselves,” said Jonathan Stern, Distinguished Research Fellow and founder of the Natural Gas Research Program at the Oxford Institute for Energy Studies.

Stern said it would be difficult to find contracts that are not volume-flexible with market-related prices. Producers, he said, would need to adapt to market requirements and find ways to trade price differentials between markets, while the relevance of intermediaries will depend on their ability to create value by taking risk.

Portfolio players and project equity holders are expected to control more volumes than consumers, with their share growing to 31% in 2025 from 24% in 2019, according to S&P Global Platts Analytics.

Post-2020 will see more LNG production capacity fall under the control of portfolio players and oil

majors, but any increase in bargaining power will be offset by the sheer volume of competitive supply that becomes available.

The decline of long-term contracting can also be interpreted as a step toward the commoditization of LNG, as project sponsors invest in liquefaction with the confidence that LNG demand will evolve sufficiently to absorb incremental production.

Contract expiry

Apart from new LNG demand, significant volumes of old long-term contracts are expiring in the coming years. These are likely to be renewed as smaller deals.

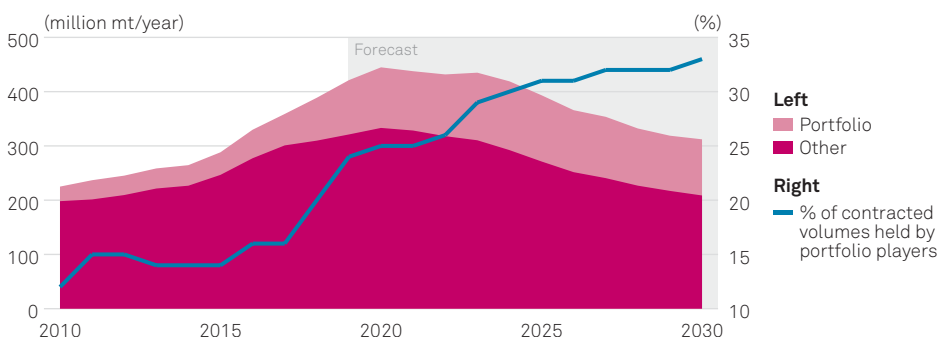
In Japan, the single-largest LNG importer with over 26% of total global LNG trade in 2018, utilities expect around 7 million mt/year of contracts with Qatar to expire by December 2021, making it the single biggest tranche of contract renewals coming up.

But Japanese utilities are unsure about maintaining long-term contracts because of uncertainties in LNG supply and demand.

The utilities have expressed preference for shorter terms, lower volume and better procurement terms including some short-term and spot contracts to manage demand fluctuation.

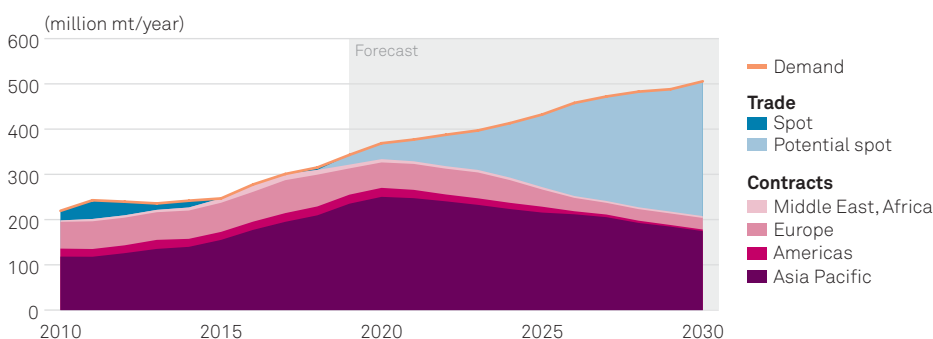
For example, JERA secured a three-year, 2.5 million mt/year contract with Malaysia's Petronas from 2018, when its 15-year 4.8 million mt/year contract was renewed. It also replaced a 25-year, 4.3 million mt/year contract with the UAE's ADNOC with a three-year deal for 0.5 million mt/year from 2019.

PORTFOLIO PLAYERS MOP UP HIGHER PORTION OF CONTRACTED SUPPLY



Source: S&P Global Analytics

PRICE DIRECTION COULD BREAK THE LULL BETWEEN UNCONTRACTED DEMAND AND RE-SIGNING EXPIRED CONTRACTS



Source: S&P Global Analytics

China, the world's second-biggest LNG importer, accounted for the bulk of Asian LNG import growth in 2018 by adding 15.8 million mt of new imports, 41% higher than 2017 and almost entirely from the spot and short-term market.

Nearly 40% of existing Chinese demand remains uncontracted, and this is growing every year.

The main drivers are low spot prices, the startup of the Power of Siberia pipeline from Russia in December 2019 and the trade war with Washington that limits its long-term procurement from the US. Even new LNG importers in south Asia — Pakistan and Bangladesh — have

grown increasingly cautious of their oil-linked long-term purchase strategies, given uncertain demand, the high relative cost of LNG as a fuel source, and the growing risks associated with pricing LNG against oil.

There are concerns about projections of a tighter market in the 2020-2023 timeframe, but even that does not necessitate a long 20-year supply deal.

Until structural uncertainties in Asia's LNG demand are resolved, and as long as buyers take comfort in a supply-driven market, the pace of long-term contracting will remain constrained well into the 2020s.

Ebb and flow

Despite the peaks and troughs of the commodity cycle, the spot market is growing increasingly robust, liquid, diverse, transparent and central to the commoditization of LNG.



Masanori Odaka
Associate Editor, LNG

The LNG spot market has seen steady growth in recent years. But this upward trajectory is not guaranteed. Instead, the next decade is likely to see the size of the spot market expand and contract, depending on a wide range of variable market forces churning global energy and financial markets.

But just like markets do not evolve in comfortable environments, those peaks and troughs of the commodity cycle will be key to full commoditization of LNG.

expansions and rising cargo churn rates. But it will remain a marginal and mutable part of the business; relatively small in size, but unique in its ability to reflect market fundamentals and the issues facing the daily operations of the industry's assets.

It is for this reason that as spot trading becomes more liquid and transparent, spot prices will eventually form the basis of longer-term contract prices.



Srijan Kanoi
Associate Editor, LNG

Prompt trade volumes have increased significantly in recent years, with physical transactions executed within a 90-day window accounting for roughly 25% of global LNG supply, according to the Paris-based International Group of LNG Importers (GIIGNL), up from 17% in 2016.

The smaller spot market, comprising one-off bilateral transactions, has also experienced growth amid rapid supply

Marginal market

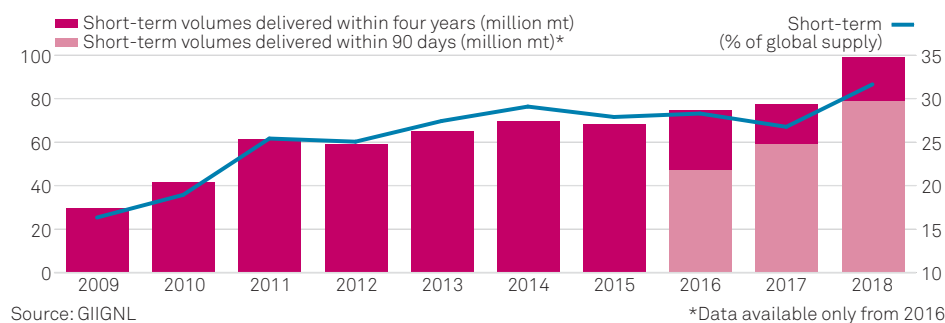
The oil market, the most liquid of all commodities markets, is a stark example of this phenomenon.

The physical spot market in oil ranged from 10% of the overall market to over 50% in the post-war era, as the oil industry moved from the control of the big international oil companies known as



Eric Yep
Senior Editor, Asia Energy News

SHORT-TERM TRANSACTIONS MAKE UP ALMOST ONE THIRD OF GLOBAL TRADE AS SPOT MARKET BECOMES MORE LIQUID, DIVERSE



the “Seven Sisters” to the nationalization of Middle East oil reserves in the 1970s.

“From the 1950s to 1973, IOC third-party sales rose from 7.2% to 22.5%, whereas IOC inter-affiliate transfers declined from just under 93% to just under 70%,” trading house Trafigura said in a 2013 white paper on the changing face of the oil industry.

Independent oil trading contributed to the eventual return of a formal spot market for oil to balance global supply and demand, as oil majors forced out of oil-rich countries had become traders of oil on the open market to maintain supply.

The growth in the spot market for LNG has been driven by similar disruptions, starting from the Fukushima disaster of 2011 that saw major suppliers like Qatar increasing short-term LNG supply to Japan and oil majors diverting record numbers of Atlantic cargoes to North Asia.

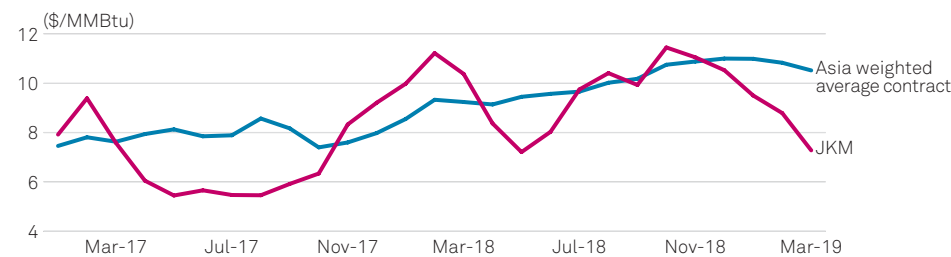
More recently, the US-China trade tensions have seen Chinese LNG importers relying on intermediaries to swap out US-origin cargoes for non-US cargoes, highlighting the role of disruptions and commodity traders in building the spot market.

Volume, price and time arbitrage

While the rise of portfolio traders and commodity trading houses will continue to boost the development of the spot market, there will be market forces constraining the growth.

In the early part of the 2020s, the LNG market is expected to tighten and lower availability could negatively impact spot market growth. On top of this, sustained periods of low prices can also force LNG projects to shut in, a potential scenario in the latter part of the 2020s.

CORRELATION BETWEEN LNG SPOT PRICES AND OIL-LINKED CONTRACT PRICES TO CONTINUE WEAKENING IN THE YEARS AHEAD



Source: S&P Global Platts

Traditionally, commodity spot markets are dependent on the ability to store or warehouse, making commodities like grains, metals and petroleum tradeable through seasonal peaks and troughs. Storage infrastructure and inventories play a crucial role in the spot price formation of commodities.

But LNG is too volatile to be stored for long enough to allow a traditional storage play. The lack of a robust futures curve for a contango play adds to trading limitations.

The fundamentally unstable nature of LNG as a tradable commodity will remain a major constraint for spot trading, but this is also expected to see some changes in the coming decade, both in terms of technology and financial market development.

Full commoditization

Between the ups and down of the classic commodity cycle, LNG will evolve to become increasingly commoditized.

From 2017 to 2019, Singapore effectively became the hub of LNG spot trading in Asia, with buyers and sellers actively seeking out optionality on cargoes.

This virtual “trading hub” has developed along the same lines as crude oil, and other

agricultural and ferrous commodities like iron ore, independent of any physical storage or transit through Singapore.

Conventional wisdom on the development of a trading hub holds that there should be an extensive network of pipelines, storage tanks and physical delivery or loading, alongside a transparent and liquid spot price.

However, Singapore has effectively developed an independent marketplace for spot LNG for Asia Pacific, with both liquidity and transparency, and minimal infrastructure. There are three essential qualities or features for a robust, deliverable spot market, according to John Driscoll, former oil trader and head of energy consultancy JTD Energy.

The first is that spot markets must be liquid and transparent with sufficient supply and trading volumes, both physical and paper.

Secondly, the spot market must be broadbased with a diverse community of market participants.

And finally, it must be supported by a widely accepted price benchmark with a transparent methodology that can inspire market confidence.

In the next decade, LNG spot markets will be pretty close to achieving these.

Ripe for change

The challenges are significant, but growing liquidity and efforts to simplify supply agreements are building the path toward more standardized, efficient and cost-competitive trading practices.



Kenneth Foo

Managing Editor, Asia LNG

The standardization of LNG trade is challenging, but structural industry changes are yielding results. The expansion of spot and short-term trades, a growing diversity of market participants, and the phasing out of destination clauses have increased market transparency and competition.

This has accelerated a market trend toward standardizing the contractual norms by which LNG cargoes are changing hands, which could have significant implications for trading efficiencies and the overall cost structure of the LNG industry.

Ripe for change

There are two key factors holding back standardization and trading liquidity: the deeply entrenched use of Master Sales and Purchase Agreements (MSPAs), and the variegated nature of LNG trading arrangements.

Currently, LNG counterparties need to negotiate a set of bilateral commercial terms through an MSPA before embarking on a trading relationship. Cargoes are then traded under another commercial agreement, the Confirmation Notice (CN), based largely on the MSPA terms.

This means that companies need to sign dozens of bilateral MSPAs, each of which are bespoke and slightly different, before

starting active trading. This restricts market access for new entrants.

Furthermore, a single cargo that has been traded multiple times will be subject to a variety of MSPAs, and this is likely to reduce efficiency over time as cargo churn increases with the development of spot trade. Traders are also exposed to legal risks if the same terms are not used in back-to-back trades.

There are alternatives. Instead of signing separate MSPAs with each counterparty, LNG stakeholders could agree on and adopt a set of general terms and conditions (GTCs) for all LNG trading transactions.

GTCs are widely used in the oil and pipeline gas markets. Shell's Suko 90 for trading Brent crude oil cargoes and the NBP 97 for UK gas trading are two such examples.

In April 2019, BP unveiled an LNG MSPA template for delivered ex-ship contracts (DES LNG MSA).

This followed a reference set of GTCs created by French law firm De Gaulle Fleurance in 2018 and a standard MSPA template from Switzerland-based trader Trafigura in 2017.

Industry groups such as the International Group of Liquefied Natural Gas Importers and the Association of International Petroleum Negotiators have also published their own templates in recent years.

Standard MSPAs and GTCs govern the bulk of terms, while the key trading variables of a spot or short-term transaction — such as price, quantity and calorific value — are typically agreed in the CN.

These CN trading variables differ from deal to deal, but increasing transparency and cargo churn have engendered greater consistency and visibility of a trading standard for DES Northeast Asia LNG.

For example, for deliveries to Japan, South Korea, China and Taiwan, nomination deadlines for alternate LNG vessel, discharge port and loading port have been almost halved to 30 days over the past few years, and that is gaining acceptance as market standard.

Rewards too big to ignore

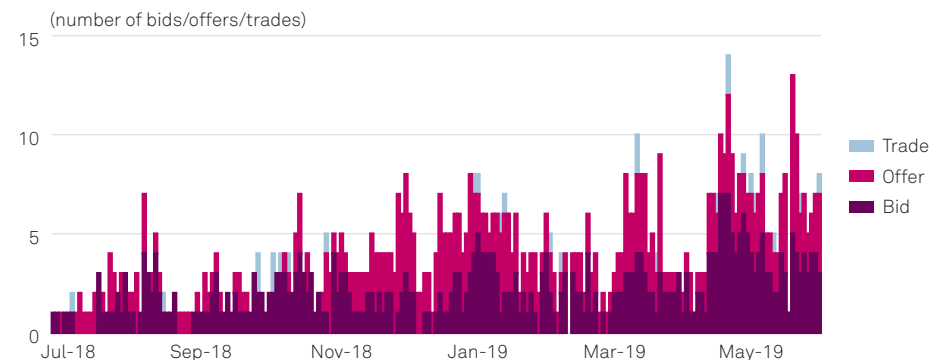
This shift toward greater flexibility will become more prominent in the next decade, as LNG of differing qualities shipped on varying voyage lengths from the US, Mozambique, Canada and Russia enters global buy portfolios, paving the way for trading standardization.

While adoption is not guaranteed, a standard GTC could be the trigger for greater market development.

Lowering the barriers to new entrants would build liquidity, while cutting the overall time and resources needed to conclude LNG transactions would improve both trading transparency and the industry's overall cost structure.

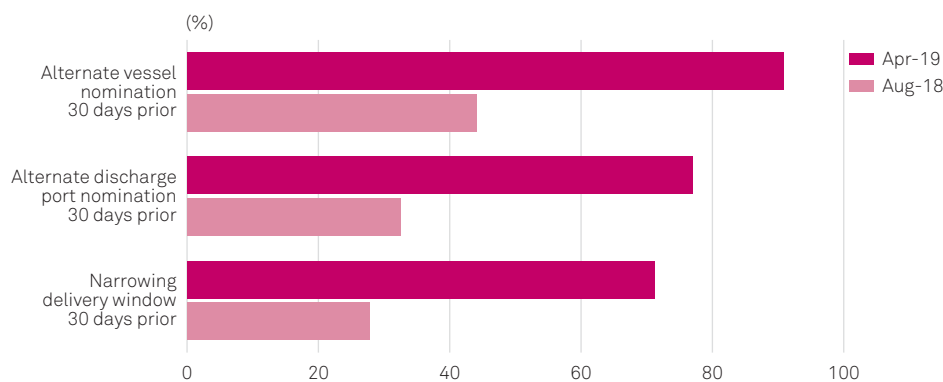
While there has been significant industry inertia in terms of adopting an industry standard for LNG trading, with companies still opting to use their own bespoke terms, the potential rewards of standardization as liquidity continues to build into the 2020s will be too big to ignore.

PLATTS ASIA LNG MOC ACTIVITY STEADILY RISING, WITH OVER 700 BIDS, OFFERS AND TRADES TO DATE



Source: S&P Global Platts

PERCENTAGE OF MOC ORDERS ADHERING TO STANDARD TERMS INCREASES



Source: S&P Global Platts

PRA, platforms and exchanges

Price reporting agencies, trading platforms and exchanges will also play a key role in this transformation.

Platts continues to refine and standardize the trading terms for its JKM Market on Close (MOC) assessment process, while setting the normalization terms for bids, offers and trades that are considered non-standard or restrictive around elements such as quality, quantity and delivery location.

In April 2019, a total of 76.9% of all MOC bids and offers stipulated nominations of alternate discharge port 30 days before delivery. This compares with just 32.5% in August 2018.

The JKM MOC standard guidelines are a first step to giving the industry more clarity on the definition of a standard spot cargo trade into Northeast Asia, which could boost trading liquidity and increase market transparency over price formation. At the same time, visibility of a set of benchmark specifications may also further encourage standardization.

Liquidity lift-off

The entry of more financial players, along with a more liquid spot physical market, is expected to speed the development of LNG derivatives in the coming years.



Desmond Wong

Managing Editor, European and Atlantic LNG

The LNG derivatives market has seen phenomenal growth over the past three years, a trend that seems set to continue given the increasing volume and scope of the physical market.

JKM derivatives volume growth in 2018 stood at 256% year on year, following growth of 295% in 2017. If 2019 and 2020 turn out to be anything like the previous years, strong growth in volumes is in store for the near term, which would significantly enhance the industry's risk management capabilities and overall liquidity and transparency.

A more liquid derivatives market tends to encourage physical spot trade as market participants feel more comfortable with taking physical positions that are not

hedged against an associated commodity, but against LNG itself.

This in turn helps boost price transparency and benchmark robustness as traders seek to participate in the price formation of both financial and physical LNG markets.

An all-time record of 46,349 lots of JKM derivatives, the equivalent of approximately 158 cargoes, changed hands in May 2019, according to exchange and broker data, a far cry from the 201 lots that were traded in the full year 2012.

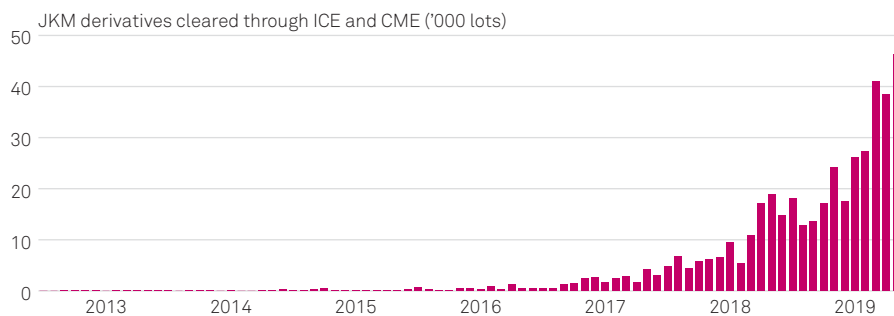
Looking forward, growth is expected to find support from an increasingly liquid physical market, the rise of LNG-based indexation, greater participation by financial entities and the overall expansion of the sector.



Luke Stobbart

LNG Managing Editor, Americas

JKM DERIVATIVES SUPPORTED BY MORE LIQUID PHYSICAL MARKET, RISE OF LNG INDEXATION AND PARTICIPATION BY FINANCIAL ENTITIES



Source: S&P Global Platts

Currently, the total number of active market participants within the JKM derivatives space is around the 45-50 mark, compared with about 40 in 2017.

The combination of fast volume growth and a relatively limited increase in the number of participants is the result of higher hedging activity from physical spot market players that now have greater confidence in the depth and sophistication of the JKM derivatives market, according to broking and trading sources.

Total volumes of JKM derivatives for 2018 amounted to the equivalent of around 36 million mt, just over a third of physical short-term and spot transactions, an indication that there is plenty of growth potential in the JKM Swap as a hedging instrument.

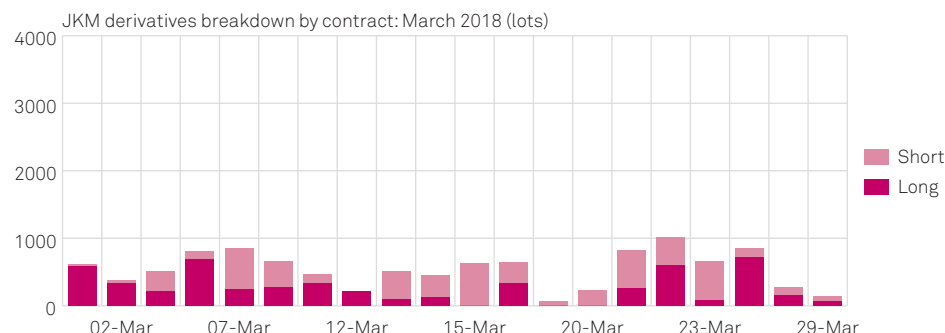
Meanwhile, as the derivatives market matures, more and more financial entities are expected to join traditional players with physical exposure, which could boost the pace of financial LNG growth in the coming years.

Forward curve liquidity deepens

With the increase in liquidity, there has also been a rise in activity further down the curve. In March 2019, trade of long-dated contracts — including Calendar Year 2020 and 2021, Summer 2020, Winter 2019, and the Q4 contract — hit 16,386 lots, or 40% of the trade for the period.

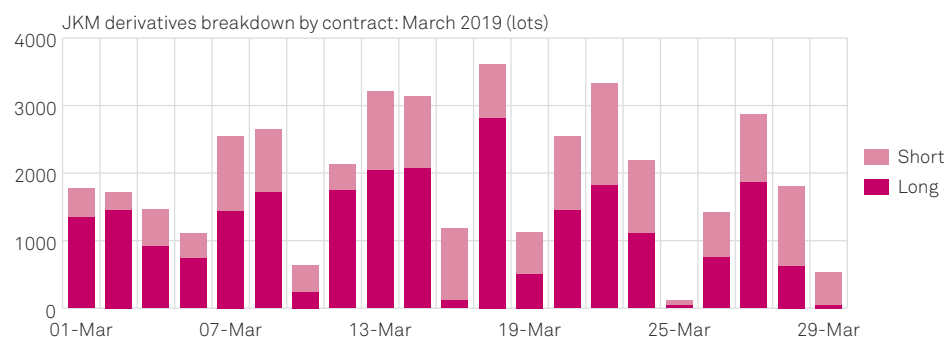
This is a significant rise from a year earlier. In March 2018, long-dated contracts for periods further

DEEPER JKM FORWARD CURVE IS DEVELOPING AS TRADERS SEEK TO HEDGE NOT ONLY SPOT TRANSACTIONS, BUT ALSO LONG-TERM VOLUMES



Long: Q4-18, Q3-18, Win-18, Cal-19, Q1-19, Nov-18, Dec-18

Short: May-18, Jun-18, Jul-18, Aug-18



Long: Win-19, Q4-19, Cal-20, Q3-19, Q1-20, Dec-19, Oct-19, Nov-19, Jan-20, Feb-20, Sum-20, Cal-21

Short: Apr-19, May-19, Jun-19, Jul-19, Aug-19, Sep-19

Source: ICE, CME

ahead than Q3 represented 19% of the total trade for the month, or 2,040 lots.

With more physical market participants willing to transact for periods further out, a deeper forward curve will allow more effective risk management, particularly with counterparties seeking JKM exposure on not just the spot, but also within their long-term portfolios.

Most recently, Total and Vitol have signed deals for 15 years of FOB cargoes to the tune of 1.5 million mt/year from Tellurian's Driftwood project priced against the JKM.

European near-term volatility grows

Volatility on the prompt periods of the LNG derivative curve has frequently been driven by movements in the European gas hubs — either the UK's NBP or the Dutch TTF — as stakeholders seek physical trade optimizations closer to the date of delivery.

Looking ahead, volatility on European gas hubs, and as a result LNG derivatives, is expected to grow as gas markets in the Atlantic adjust to changing fundamentals such as the loss of production from the giant Dutch

Derivatives growth

Groningen field, a lack of long-term storage in the UK and dwindling North Sea gas production.

At the same time, this price volatility is also likely to draw new market participants to the LNG derivatives market.

Volatility at the TTF hub since late 2018, triggered by swings in carbon pricing, cold snaps and competition from renewables, has seen JKM derivatives chase the European gas markets, as JKM traders seek to balance their positions against their “market of last resort.”

At the same time, the closure of the arbitrage between the Asia-Pacific and the Atlantic regions due to low demand from the traditional physical JKM markets has left market participants having to take additional reference from European gas markets when managing risk, particularly for parties with Atlantic-sourced offtake.

Financial players join in

This volatility in the European gas markets, which would ordinarily have seen more conservative counterparties

stepping back, has brought in new financial players.

According to broking sources, at least three new speculative players joined the JKM market toward the end of Q1 2019.

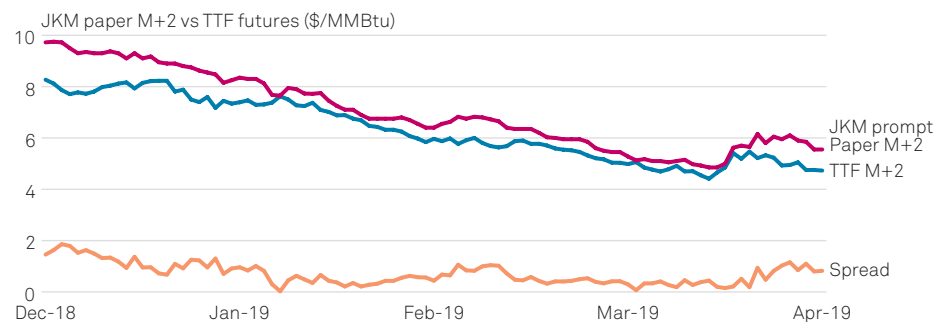
“You are beginning to see more hedge funds joining now, while the size of each transaction is also growing,” said one broking source.

At this stage of market development, the trade in LNG derivatives remains significantly less than the total physical traded volumes, whereas other mature commodities regularly see double-digit multiples.

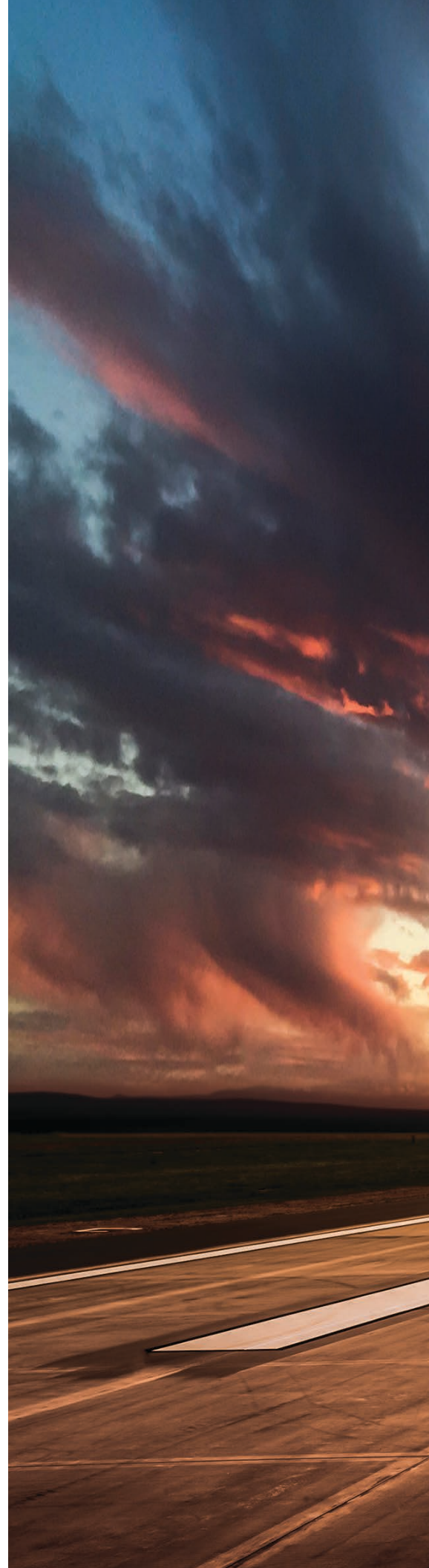
The deepening of the curve and greater use by existing market participants, combined with newer players that thrive on growing volatility across global gas markets, can only support continued growth of LNG derivative volumes.

And by 2020 several new physical LNG export projects will begin to ramp up, bringing an entirely different perspective into the LNG derivatives space, one where the spread between US gas and consumer market prices may matter more than that of European gas and Asian LNG.

JKM DERIVATIVES CHASE THE DUTCH TTF AS TRADERS SEEK TO BALANCE THEIR POSITIONS AGAINST ‘MARKET OF LAST RESORT’



Source: S&P Global Platts



“By

2020 several new physical LNG export projects will begin to ramp up, bringing an entirely different perspective into the LNG derivatives space, one where the spread between US gas and consumer market prices may matter more than that of European gas and Asian LNG.

”

New wave

The IGU's Joe M Kang discusses how flexible supplies from countries such as the US, Australia and Russia will bring about more short-term trading and a new wave of commoditization.

By Abache Abreu



Joe M Kang
President
International Gas Union

What is driving LNG toward becoming more commoditized in the 2020s?

There is, of course, an evidently greater elasticity of supply and demand, with many more players on each side than there ever were thanks to technology unlocking new volumes and accessibility. With significant additions of new liquefaction capacity and continued growth in production, particularly from Australia, the US and Russia, all of which are sources of flexible supply, commoditization is inevitable.

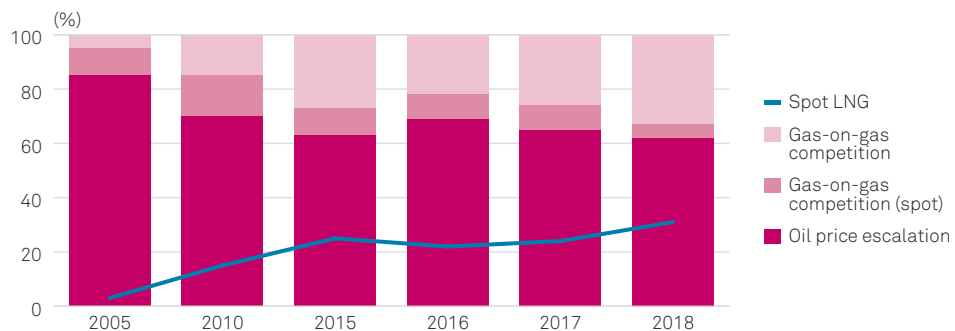
On the demand side, the increasing global need for energy will play a major role as a macro driver. There is ongoing

global economic development and gradual global progress in getting populations out of poverty.

Development and growth require energy, and so global energy demand is expanding, particularly in Asia, and hopefully Africa will also catch up soon as it is currently falling behind on poverty reduction. At the same time, there is an urgent need to improve air quality and reduce carbon emissions.

Natural gas is a vital fuel to meet both of these objectives, and LNG is making it possible to bring it to virtually anywhere in the world. Thus, greater demand for reliable and sustainable energy around the world will continue to drive further commoditization of this versatile fuel.

THE SHARE OF GAS-ON-GAS COMPETITION* IN GLOBAL NATURAL GAS MARKETS IS INCREASING, DRIVEN BY GROWING LNG SPOT LIQUIDITY



*Gas-on-gas competition is a price formation mechanism determined by the interplay of supply and demand, and a key indicator of market commoditization.

Source: IGU

How different will LNG trading look by the middle of next decade?

It is difficult in this highly dynamic, fast-paced world to make predictions, and that is the reason why most outlooks are scenarios and not predictions.

Despite that, on the whole, I expect to see more of the developments we are beginning to see now. The number of third-party traders and aggregators is likely to keep growing, adding more flexibility and hedging opportunities to the market. The share of non-long term trade will continue to grow. There could even appear a global benchmark hub price, since we do see a growing convergence between the different indexes already.

What are the biggest challenges and opportunities facing the LNG industry?

Most opportunities stem from challenges that LNG helps to overcome. The greatest determinants of growth for the gas industry will be cost competitiveness, sustainability and security.

The industry must focus on keeping its costs down, and this is particularly important for LNG as a commodity. In many of its growth markets, gas is competing with often cheaper marginal cost coal, because in most of these markets the externalities of pollution are not priced or regulated.

Second, the gas industry needs to continue to bolster its environmental credentials in order to deliver on the vital environmental role that gas is set to play in the sustainable energy future. The industry has been

showing great progress with initiatives like the Methane Guiding Principles Coalition and other voluntary emissions reduction programs. The IGU is very active in this space as well, as our global reach across all five continents and the whole value chain positions us well to be an effective advocate.

Finally, security of supply is actually a huge advantage that LNG delivers. Greater supply diversification and financing optionality, with smaller volumes available on the market, enabled new small players like Bangladesh and Panama to purchase LNG cargoes last year. The advent of floating regasification technologies has further added to the energy security advantage that LNG offers, making access more flexible in countries like Brazil where LNG provides seasonal reliability during fluctuations in domestic hydro power generation.

What are the key steps stakeholders should take to adjust to this changing marketplace?

At risk of stating the obvious, prudent planning, while keeping your ear to the ground, is always a good strategy in changing environments.

While it is an extremely dynamic marketplace and industry, it still is changing relatively gradually, allowing to plan ahead by making smart investments. Specifically, investments in infrastructure, like storage and investments in innovation and technology are really critical to avoid shocks and bottlenecks down the road.

Ultimately, the industry has to show leadership toward a more sustainable energy future.



Fading taboos

LNG stakeholders face an acute need to reposition themselves, as competitive threats from all directions set to accelerate the evolution of LNG towards a modern commodity.



Ira Joseph

Head of Gas and Power Analytics

Breaking taboos in the LNG industry is a time-honored tradition. The guardians of the status quo have long heaped scorn on agents of change. Sometimes they succeeded, sometimes they failed, but the commercial arc of the LNG universe is unquestionably bending toward change.

These changes are happening out of necessity and not out of choice, and what previously seemed to be formidable obstacles are rapidly deteriorating into historical footnotes.

Remember how LNG projects could not move forward without destination clauses, long-term contracts or oil-indexed pricing? What about how it was impossible to make a final investment decision unless 50% of the capacity was signed up to long-term deals? How could a pricing slope go below 14% and still cover long-run marginal costs?

LNG markets in the next decade will be breaking all of these taboos and several more sacred edicts.

Entrenched players will continue to squeeze every last dollar, yen, and riyal out of what was once a paragon of high-margin business in the energy sector.

But they also now face highly commercial market realities that will severely limit the relevance of the traditional project model. LNG industry mainstays, like long-term

contracts and oil indexation, are morphing into something resembling a modern, fundamentals-driven commodity market.

Setting the scene

Investors in the LNG sector, once the most staid of businesses, are probing new facets of the energy space in order to create higher demand.

In any form, the cost of moving gas from point A to point B remains relatively high and problematic, while the number of competitive fuel options are rising within key use sectors for gas. Taking the most expensive form of gas supply (imported LNG) and placing it into the most competitive sector for gas use (power) will be the defining story for gas demand growth in the next decade.

It may require a severe curtailment or complete elimination of oil indexation as the driving force in LNG pricing, and recognition that pricing gas at a competitive level with coal and battery storage is the absolute least that needs to transpire.

Of course, the ability to price LNG against oil to compete with coal and battery storage is possible, but why would it hold on to this legacy when commercially viable alternatives are readily available?

Oil issues

The supply push coming from oil-centric upstream developments, combined with a narrowing of traditional downstream opportunities, is forcing LNG developers to rethink their strategy for marketing volumes. The problem of how to market LNG is so acute that it is now threatening to curb upstream development for oil. The price of oil and gas has moved on from an era when the two commodities competed downstream in the home or industrial park to one in which gas must compete with coal and battery storage in power generation.

As a result, price movements for oil and gas have become largely inverted and therefore pricing the latter off of the former has become highly problematic. In the extreme, higher oil prices in the US have led directly to negative gas prices in regions such as the Permian Basin. While these price inversions are eventually solved by additional midstream and downstream buildouts, the problem is a chronic one that is forcing change.

The move further downstream by LNG sellers into import terminals, power generation, and transportation fuels (bunkering and trucking, primarily) comes from increasing pressure tied to the upstream realities. Creating more gas demand has become an existential threat to higher oil and liquids production.

Almost every cubic meter of LNG produced over the next two decades in the US will be sourced from wet gas production, where the considerably higher price of oil, NGLs and condensates will dictate the economics of drilling, completions and output. As a result, incremental gas is

Highlights

Sellers will need to move further downstream and foot the bill of building more tanker and regasification capacity, as supply options build and uncertainty clouds demand growth.

Traditional buyers will be reluctant to deploy more capital into LNG infrastructure or pay a premium for long-term security of supply amid uncertainty in their domestic markets.

New projects will compete directly with legacy LNG projects to secure market share, as 40% of existing long-term contracts are due to expire within the next decade.

Majors and NOCs will move ahead with LNG projects regardless of the downstream outlook, as financing becomes more internalized and customers become equity holders.

Startup developers will need to develop aggressive forms of pricing, as their strategy's success will depend on their ability to attract buyers and long-term cash flow through contracts.

Oil indexation in LNG contracts will become more problematic as time passes, given that the fundamental underpinning of the two commodities are headed in opposite directions.

Renewables will move from a competitive threat to a potential partner in environmentally sustainable solutions in fast growing economies in need of a pathway to decarbonization.



being produced without a corresponding strategy for how it will be consumed.

The assumption of a wellhead price for gas at close to zero will help with the marketing of the LNG, but also shines a light on the reality that gas and LNG specifically are moving from a downstream, high-margin business to an upstream cost-of-production one.

Trading LNG

Many LNG sellers will also be moving further and further downstream in order to secure greater access to demand. With supply options building and demand options limited, the financial burden of building more tanker capacity and regasification is also shifting from the buyer to the seller.

And the shift has a chance of moving beyond the import terminal as well. LNG demand will only grow if the pricing point can be lowered, and it is the sellers that will need to foot the bill. Shaving down costs on delivery of LNG is necessary for gas to find a sustainable market.

Over the past decade, solar panels and wind turbines have gone from being idle to dire threats to gas demand growth in the power generation sector. The gas demand narrative has gone from being “the fuel of the future” to “the fuel of transition” to “the fuel to use four hours a day to stave off intermittency.”

The difference is quite significant between forecasting gas demand growth based on 24 hours a day to forecasting it based on four hours per

day. Outside of coastal China, growth prospects for gas have been severely compromised by the introduction of renewables as a baseload source for power generation. A decade ago, most forecasts for power would have been comfortable giving 75-90% of the growth to gas as the generating fuel of choice. Now, gas is lucky to hit 40% and most of the risk is to the downside.

LNG sellers are now moving from seeing renewables as a competitive threat to a potential partner in offering environmentally sustainable solutions in fast-growing economies ravaged by pollution and in need of a pathway to decarbonization.

“Taking the most expensive form of gas supply (imported LNG) and placing it into the most competitive sector for gas use (power) will be the defining story for gas demand growth in the next decade.”

Carving out more demand

The larger traditional buyers of LNG are also facing competitive headwinds at home, hence the reluctance to deploy more capital into import terminals and tankers without a clearer view as to what they face.

The cost of building out a gas grid remains exorbitant and, outside of

markets like coastal China, gas prices established by governments at the burner tip are largely underwater compared to import points.

Building out residential/commercial use in a country like India is simply not realistic due to the cost.

Raise prices and demand growth is compromised. Alternatively, keep prices low and purchases must be subsidized. And if the government needs to subsidize LNG imports, it therefore faces a broader policy choice of preferring to subsidize the build-out of renewables. These questions are existential for traditional utilities, which have been the backbone of LNG demand growth over the past 50 years.

For LNG buyers, the call for more flexibility in signing LNG contracts is somewhat of a euphemism for actually saying: “We’d rather not sign any long-term contracts at all.”

Hence the insistence by buyers on securing contracts for lower volumes and fewer years. To some extent, buyers still value security of supply, but they are no longer willing to pay a price premium for it. Volume and length of contract are the truest expressions of security needs among new deals.

Signing low-volume, long-term deals certainly has other advantages. Some buyers are signing up new volumes from the US just to create more leverage for re-signing older volumes that are near expiration at better prices. Roughly 40% of all long-term LNG contracts will be expiring over the next decade. New LNG projects are therefore competing directly with legacy LNG projects to secure market share.

For more information, please contact the Platts office nearest you:

NORTH AMERICA

New York

2 Penn Plaza, 25th Floor
New York, NY 10121-2298, USA
P: +1-800-PLATTS8 (toll-free)
P: +1-212-904-3070 (direct)

Boston

225 Franklin Street, 14th Floor
Boston, MA 02110, USA
P: +1-800-752-8878
P: +1-617-530-8300

Denver

1800 Larimer Street, Suite 2000
Denver, CO 80202, USA
P: +1-720-264-6600

Hightstown

148 Princeton-Hightstown Road
Hightstown, NJ 80021, USA
P: +1-800-PLATTS8 (toll-free)

Houston

Heritage Plaza
1111 Bagby Street, Suite 2200
Houston, TX 77002, USA
P: +1-800-PLATTS8 (toll-free)

Pittsburgh

424 South 27th Street, Suite 306
Pittsburgh, PA 15203, USA
P: +1-412-431-4370

Washington, D.C.

1200 G Street NW, Suite 1000
Washington, DC 20005, USA
P: +1-212-904-3070

LATIN AMERICA

Buenos Aires

Tte. Gral. Juan D. Perón 346,
6th Floor
(C1038AAH) Buenos Aires, Argentina
P: +54-11-4121-4810

São Paulo

Av Brigadeiro Faria Lima
201 21st Floor
São Paulo – SP Brasil – 05626-100
– Brazil
P: +55-11-3818-4100

EUROPE, MIDDLE EAST AND AFRICA

London

20 Canada Square
9th Floor, Canary Wharf
London E14 5LH, UK
P: +44-20-7176-6111

Dubai

DIFC, The Gate Precinct
Building 1, Level 05
P.O. Box 506650
Dubai, UAE
P: +971-4-372-7100

Moscow

Business Center
Mokhovaya
4/7 Vozdvizhenka Street
Building 2, 7th Floor, 125009
Moscow, Russia
P: +7-495-783-4141

Stavanger

Øvre Holmegate 1
4006 Stavanger
Norway
P: +47-51-89-06-66

ASIA-PACIFIC

Singapore

12 Marina Boulevard
#23-01 Marina Bay
Financial Centre Tower 3
Singapore 018982
P: +65-6532-2800

Beijing

Suite 1601, 16/F Tower D
Beijing CITC
A6 Jianguo Menwai Avenue
Chaoyang District
Beijing 100022, China
P: +86-10-6569-2929

Hong Kong

Unit 6901, Level 69
International Commerce Centre
1 Austin Road West
Kowloon, Hong Kong
P: +852-2841-1035

Shanghai

33/F Shanghai Plaza
138 Huaihai Road (M)
Shanghai 200021, China
P: +86-21-5110-5488

Tokyo

Marunouchi Kitaguchi
Building, 28th Floor
1-6-5 Marunouchi
Tokyo 100-0005, Japan
P: +81-3-4550-8300

Melbourne

Level 45, 120 Collins Street
Melbourne
VIC 3000, Australia
P: +61-3-9631-2000