LNG China
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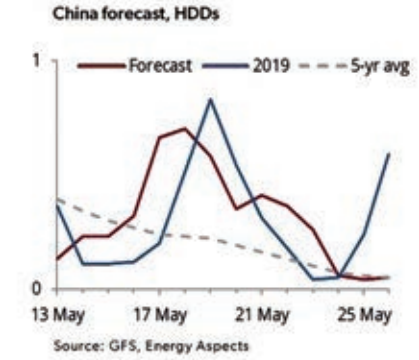
China hungry for Australian LNG as economy bounces back

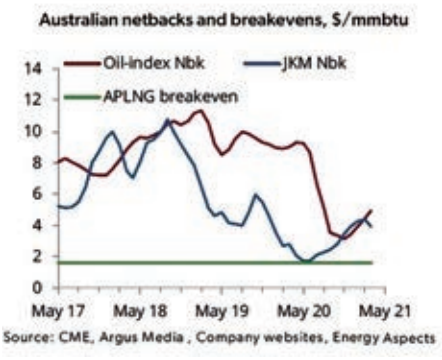
The Chinese economy has recovered swiftly after lock-downs were lifted and factories already operate at 87% of normal output since early April, pushing up energy demand. Australia emerged as China's top LNG supplier, delivering a total of 77 cargoes in April and May – compared to just 10 cargoes lifted over the same period from the United States, where liquefaction capacity is at risk of shut-in due to low prices and expectations of depressed global demand well into 2021.

At current low oil and gas prices, it makes little sense to ship LNG from the U.S. Gulf Coast to Asia. The price spread between Henry Hub and the Japan Korea Marker (JKM) is not wide enough to cover shipping costs, so these cargoes are heading to Europe instead, where storage levels are filling up fast.

Poten & Partners, a global ship and commodity brokerage, says it is "very clear that there is going to be some kind of supply response to balance the market." LNG exports facilities in the United States are "likely to shoulder most of the downside," ship brokers said, referring to a partial closure of some liquefaction capacity, deferred construction of new Trains and delayed project FIDs.

According to Timera Energy Consultants calculations, shut-in of U.S. gas production take place at a price range of US$4.0-4.8 per MMBtu, considering LNG vessel spot charter rates have fallen to around US$40,000 per day, down nearly 80% from Q4-2019 highs at over US$200,000 per day.





Australia's oil-linked LNG remains attractive

Australian gas exporters have jumped at the opportunity to ship more LNG to China which turned into the biggest buyer of Australian cargoes, overtaking Japan. In contrast to US suppliers, it's unlikely there will be wells shut-ins of wells or a major cut in output from Australian upstream projects due to lower oil and LNG prices.

"There is certainly no sign so far of reduced Australian LNG shipments to China," Graeme Bethune, head of Australian energy consultancy EnergyQuest said, adding that Australia delivered 40 cargoes to China in April, up from 36 in April 2019.

"Most Australian LNG is sold under long-term oil-linked contracts and oil prices would need to remain very low for a considerable period for there to be shut-ins," he said, explaining market indicators show that "west coast LNG projects stay 'cash flow positive' at oil prices above about US$15 per barrel and east coast projects above US$25/bbl."

Strikingly, the Arrow Energy deployment - a 50:50 joint venture by Shell and PetroChina - has just taken financial close for the first phase of the $10 billion project. This unexpected move will add up to 90 billion cubic feet per year (cbf/y) of coal seam gas supply by 2023.

Woodside Petroleum, the largest Australian exporter and operator of North West Shelf LNG and the nearby Pluto LNG, stressed it had no plans to cut LNG production given that shipments are typically based on 12-month schedules.

Most big Asian buyers are seen to honour their offtake commitments for long-term LNG supply, though much fewer spot cargoes are sold at current low prices. There were no spot cargoes in April from the North West Shelf or the Chevron-operated Gorgon LNG plant in Western Australia.

"Spot deals from other projects were at very low prices," EnergyQuest said. "One cargo from Wheatstone was sold at US$1.80-1.90/MMBtu and two cargoes from

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Inpex-operated Ichthys LNG and one cargo from ConocoPhillips' Darwin LNG with the latter all believed to have been priced at around US$1.70-1.75/MMBtu."

China's gas demand slows, but still moves the market

While China's economy getting up to normal speed, coronavirus lockdowns persist and depress gas demand in parts of Europe and the United States. Staying cautious, Citigroup's research says China's full-year gas demand growth at just 4% and the bank's director Antony Yuen argues the country's LNG imports could peak in the early 2020s as pipeline gas imports started to grow faster than LNG import this year.

During the first two months of 2020, when the pandemic peaked in China, state-buyers kept importing some cargoes, filling up strategic storage and making advantage of low spot prices. At the same time, the Gazprom-led Power of Siberia gas pipeline is expected to transport 5 Bcm of Russian gas to northern China this year and volumes will reach 38 Bcm/y full capacity in 2025.

Prior to the pandemic, Chinese state-owned oil and gas companies were planning to bring online some 80 billion cubic meter (Bcm) of new LNG regasification capacity by 2024. Though the timeline of this capacity build-out may be delayed, once realized, it will allow for more than 40 Bcm of additional LNG imports assuming a conservative utilization rate of 55-60%.

Counting the cost of LNG vs. pipeline gas

Russia is also trying to import more pipeline gas and LNG to China, both via the newly opened Power of Siberia interconnector and via Northern Sea Route from Yamal LNG. State-run Chinese buyers tend to like the idea of stable pipeline gas supplie, however, the competitiveness of Russian gas imports through the Power of Siberia interconnector in China is entirely dependent on where it is sold.

At full capacity, China's northeast region will consume around 15 Bcm/y, the Beijing-Tianjin-Hebei (BTH) and Shandong markets will consume a further 13-15 Bcm/y and the Yangtze River Delta area (including Shanghai) around 8-10 Bcm/y. Looking at the Yangtze River Delta, Russian gas supply is "not a major competitive threat" to LNG imports, Wood Mackenzie says, given that the Yangtze River Delta already has six regas terminals in operation, with a further three greenfield projects under construction.

Things look different further north. "In the Northeast, tariffs from the Russian border will only be around $1/MMBtu to reach a city such as Shenyang, making 'Power of Siberia' gas attractive against LNG," said Wood Mackenzie Asia Pacific vice chair Gavin Thompson. "But to take gas further south to Shanghai will increase tariffs to around $3/MMBtu."

Recent LNG contracting trends are seeing term-deals signed with around 11% oil-indexation, Wood Mackenzie understands. With such a pricing formula, new LNG projects "would not really have to fear Russian pipeline gas into China," analysts say, adding that the 'Power of Siberia' pipeline will take an estimated seven to nine years to reach full capacity.

Uncertainty on PoS gas price, future tariffs

Analysts in the West have, however, only a limited understanding of exactly how the Power of Siberia gas contract is priced and what China's future pipeline tariffs will be following the establishment of a new national pipeline company. "China's recent proposals to exclude city-gate prices from national regulations, mean Russian gas prices will be deregulated, potentially encouraging PetroChina to raise wholesale prices," Thompson said, stressing this move "would also benefit LNG." ■

Gazprom ramps up production to boost exports to China

Russia's state gas company Gazprom seeks to boost gas production in Yakutia and enhance pressure as well as throughput at the 'Power of Siberia' pipeline. There is "plenty of supply," Gazprom noted, to ramp up exports through the interconnector to China gradually to 38 Bcm/y, as planned, by 2025.

The Russian gas major confirmed it is fast-tracking major investments within its Eastern Gas Program to ramp up production and gas transmission capacities from Siberia to China. In Yakutia, Gazprom is working to bring the Chayandinskoye gas field to its design output of 25 Bcm and the Amur Gas Processing Plant is nearly 60% complete.

With a design processing capacity of 42 Bcm/year, the facility is essential to ramp up throughput of the China interconnector. To power the Amur GPP, Gazprom is building a new 160 MW combined-cycle power station called Svobodny TPP which is scheduled to start up in late 2020.

Installation of the first and second production trains is nearly finished and equipment is being prepared for start-up and commissioning. At the same time, gas separation equipment is being installed on train three and four.

New focus on Northern Gas Corridor

The Russian arctic, notably the Yamal Peninsula is another key focus of Gazprom's upstream efforts. This strategic oil- and gas bearing region has explored gas reserves of 16.7 trillion cubic meters, where Gazprom seeks to achieve an annual output of 310-360 billion cubic meters of gas. To this end, 52 new gas wells will be brought onstream at the Bovanenkovskoye field as well as a connecting pipeline, stretching to the Kharasaveyskoye field.

Eager to expand the northern gas transmission corridor, Gazprom is setting up compressor stations and workshops at the Bovanenkovo- Ukhta 2 and Ukhta-Torzhok 2 gas pipelines. Supply from the northern gas corridor can be transported westbound and partially serve as a feedstock for the Nord Stream 2 pipeline. ■

Map of Gazprom's Eastern Gas Program

LNG North America

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China returns to work but energy demand remains patchy

Manufacturing is resuming in China, but the recovery from the coronavirus lockdown still needs to translate in a substantial rise in energy demand. China was the first to implement containment measures, in mid-January, and experienced a record 6.5% drop in gas demand in Q1-2020, but the International Energy Agency (IEA) still expects the country's gas demand to triple by 2040.

China faced the coronavirus crisis earlier than other regions, with around eight weeks of lockdown during the first quarter of 2020, more than any other region. The pandemic reached its peak in February and by that time growth in gas consumption was close to zero: according to the National Development and Reform Commission, apparent gas consumption grew by 1% in January and February from a year earlier.

Energy demand in China's industrial sector, notably from manufacturing and construction, fell by a staggering 68% at the height of the crisis. Anticipating a fast recovery, the IEA still sees China's full-year 2020 electricity consumption to come in 2% lower than pre-year levels.

Impacts were more limited in other parts of the world, where restrictions began in March and were introduced progressively. Electricity demand fell by 2.5% to 4.5% in Europe, Japan and Korea in the first quarter this year, relative to Q1-2019. The U.S. has been particularly badly hit by the pandemic, with energy demand down 6% in March and April, recovering slightly in May.

Unprecedented drop in energy demand

Globally, the decline in energy demand is "unprecedented," the IEA said, explaining that in absolute terms it is the equivalent of losing the entire demand of India, the world's third largest energy consumer. Advanced economies will see the biggest declines, with demand set to fall by 9% in the United States and by 11% in the European Union.

"The impact of the crisis on energy demand is heavily dependent on the duration and stringency of measures to curb the spread of the virus," the IEA executive director, Dr Fatih Birol said. Each month of worldwide lockdown at the levels seen in early April is found to reduce annual global energy demand by about 1.5%.

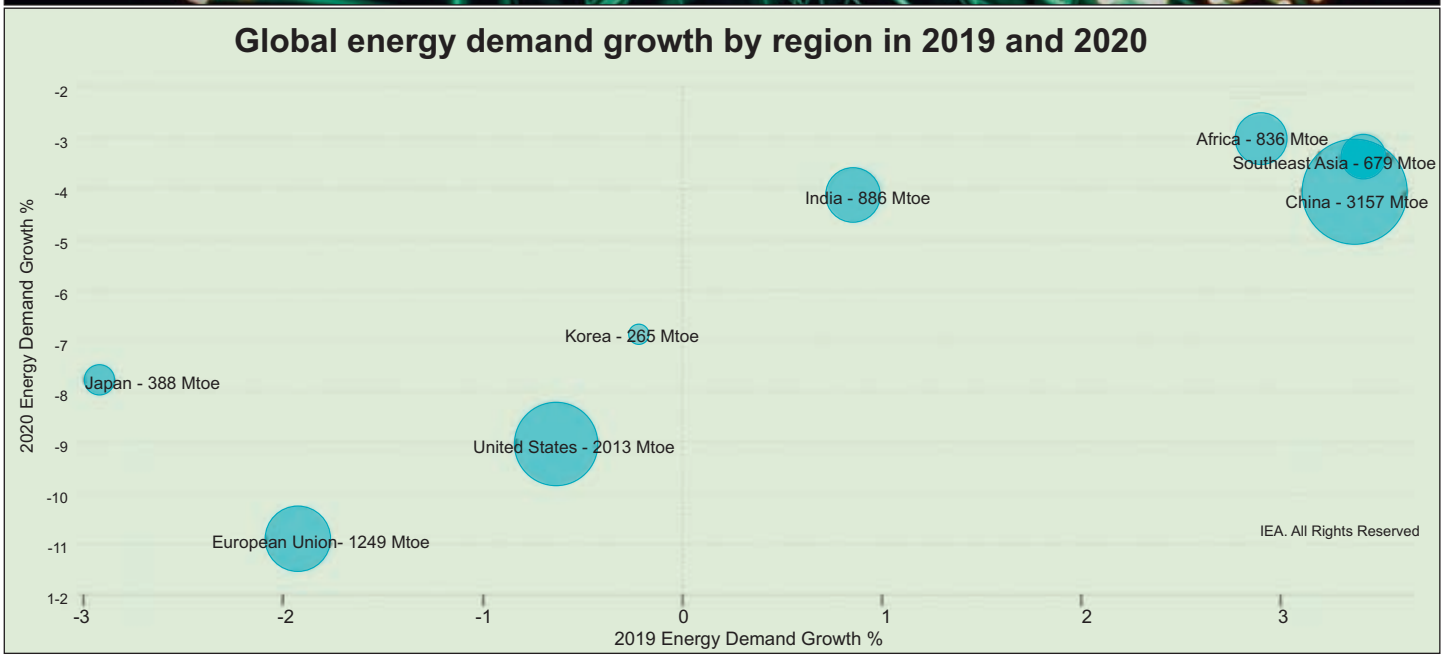
Looking ahead, it will largely depend on the country's economic resilience and speed of recovery as to how much second quarter energy demand growth will be able to balance the demand destruction during the height of the pandemic.

Renewables and gas claim greater share of generation mix

Though global electricity generation was 2.6% lower in the first quarter this year, compared with Q1-2019, renewables-based generation increased by 3% due to a double-digit rise in output from wind and solar photovoltaic output.

Gas-fired generation manage to gain 4% market share, buoyed by low prices for natural gas in markets around the world. In some markets, coal-to-gas switching opportunities based on fuel costs arose for the first time. Gas is increasingly used to complement China's emerging renewable energy sector, as a fuel for onsite power units at Chinese factories and for district heating.

Coal-fired power generation, in contrast, was "squeezed from all sides," IEA analysts noted, with output down 8% in Q1-2020 relative to the pre-year period. Analyst say80% more natural gas will be required over the next 20 years in China, India and Southeast Asia in order to displace higher carbon-producing coal. ■



Gas supply contracts shift to hub-indexation as Asian markets liberalize

Terms of natural gas sales are changing. In the power sector gas no longer competes with oil, but coal and renewables – making hub-indexation traders' preferential choice. Across Asia, including China, the Platts Japan Korea Marker (JKM) grows in popularity and several long-term gas supply contracts have come under review following the recent plunge in oil prices.

In liberalised markets, the economics of natural gas are not intrinsically linked to the price of oil products. Developments in hydraulic fracturing drove the cost of gas production down but did not have any considerable impact on the price of oil. This relatively 'cheap' gas flooded the markets and drove the price of gas down, without a similar impact on the price of oil, according to a paper published by the international legal firm, DWF Law.

At the same time, electricity generated from gas and other fossil fuels is challenged by rising volumes of wind and solar power supply, produced at near-zero operating cost. This greatly impacts the cost of energy, although to a different extent in any given market.

"All of these factors undermine the notion of a 'positive' correlation between the prices of oil and natural gas. Furthermore, these factors argue against the proposition that oil products and natural gas are close pricing substitutes," the paper states.

Hub-indexation

Oil-indexation is increasingly viewed as outdated. Due to its high liquidity, price transparency and relevance, many argue that hub-indexation is more preferable for the purposes of long-term gas sales agreements (GSAs) than oil-indexation.

"The indexation of gas to oil products made the gas price formulae volatile. A large movement in the oil price of oil affected the price of alternative fuels and, consequently, the potential margins of the sellers and buyers of gas," lawyers at DWF pointed out. "In the past decade, we have seen oil volatility materialise through the peaks and troughs of 2010, 2011, 2015, 2016, 2018 and now 2020."

"Due to its high liquidity, price transparency and relevance, many argue that hub-indexation is more preferable for the purposes of a GSA than oil-indexation," they underlined.

The U.S. Henry Hub, created in the early 1950s, is the world's most liquid gas trading hub by a long run. European hubs like the UK's National Balancing Point (NBP) and the Dutch Title Transfer Facility (TTF) are more recent and date back to 1996 and 2003, respectively.

LNG tanker arriving at Tianjin regas terminal, operated by Sinopec.

Asian markets open up

Gas markets in Asia are not fully liberalized yet. Most gas is still sold under oil-indexed long-term gas sales agreements (GSAs), using different baskets/cocktails of oil products).

Some buyers have partially linked their GSA prices to European hubs, but this is not an ideal proxy. The Platts Japan Korea Marker (JKM) is growing in popularity and has led to some buyers seeking to re-negotiate their terms under oil-indexed GSAs previously linked to the JCC (Japanese Crude Cocktail).

"In order to make the shift from oil-indexed contracts to gas-indexed contracts, a benchmark price will have to be generated. This could only be done by the liberalization of the markets," the report points out. "In the meantime, it is likely that the frequency of gas price review arbitrations will steadily increase as the price of oil has taken a dramatic turn."

Chinese majors review LNG contracts

Many large Asian gas buyers have started reviewing their GSAs and market observers see companies like Korea's Kogas, the Chinese majors and Petronet LNG in India "facing new price review challenges in the current economic climate."

The Japanese market has slowly been opening up since 2007. "However, this growth is stunted due to limitations of domestic pipeline connections, which pose barriers to new entrants into the market," said the report.

South Korea is at an earlier stage of liberalization with state-run Korea gas Corp. importing around 90% of the country's gas demand. China's increased demand for gas has also resulted in accelerated development in the country's infrastructure in order to accommodate the additional supply. ■

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Expansion will turn Tianjin Port into China's main LNG hub

The area around Tianjin in northeast China currently has floating and onshore import terminals and is already the nation's leading LNG importer, but an expansion of the onshore terminal and the construction of a new facility, the largest in China, will turn the Port into the main China LNG Hub and the biggest in Asia.

With a population of around 113 million, the Beijing-Tianjin-Hebei region is one of the most important economic engines within China with a rising energy demand.

According to customs data, Tianjin Port already accounted for nearly 20% of all Chinese LNG imports during the first four months of 2020. From January to April, LNG imports through the Tianjin port increased 25.6% year-on-year to total 3.92 million tonnes. The LNG imported through the port mainly came from Australia, Russia and Asian nations such as Malaysia and Indonesia.

The Tianjin North onshore terminal is operated by China Petroleum and Chemical Corp., also known as Sinopec which plans to more than double its LNG receiving capacities to 41 million tonnes by 2025. State-dominated Sinopec's wants the expanded Tianjin terminal, which guarantees supplies to Beijing during winter, to have a capacity to handle 12 mpta of imports. In addition, Sinopec also operates the Qingdao LNG terminal in Shandong province, and the Beihai facility in the Guangxi autonomous region bordering Vietnam.

Bird's eye view of Tianjin Port

At Tianjin, another LNG import facility is under development by Beijing Gas Group, known as the Nangang project. It is currently scheduled to come on line in 2022 with 10 tanks and up to 2 million tonnes of storage. Beijing Gas has obtained government approval, as well as $500 million in financing from Asian Infrastructure Investment Bank, to build an LNG imort terminal in the Nangang district of Tianjin City. The proposed terminal will have an initial 5mtpa of regasification capacity which will gradually be increased to 25 mtpa of storage capacity, making it the biggest single LNG import centre in Asia.

Beijing Gas's new Tianjin LNG terminal will be equipped with a jetty to receive the largest carriers of 260,000 cubic metres capacity. There will additionally be a pipeline of 230 kilometres to send regasified LNG supplies from the coast to gas storage facilities near Beijing.

There has also been a floating storage and regasification unit (FSRU) deployed in Tianjin since 2013 by China National Offshore Oil Corp., (CNOOC), the nation's largest LNG importer. The FSRU 'Höegh Esperanza' has been predominantly used during the winter seasons. ■

Freeport Train-3 aims to send cargoes to China

Commissioning of Freeport LNG Train 3 in early May has pushed the plant's overall nameplate capacity to 15 mtpa, with developers sending some headline-catching cargoes to China. However, overall shipments are down nearly 15% amid subdued demand and low LNG prices.

The economic outlook for China - and by extension its LNG demand growth - is uncertain, the country's latest economic data shows. Finding portfolio players willing to commit to long-term liquefaction tolling agreements (LTA) under prevailing conditions will be difficult, LNG Unlimited Data finds. Consequently, our analysts do not expect Freeport LNG to take its Train 4 FID any time soon, though Train 3 stared operations in early May.

PetroChina vows to slash capital spending

PetroChina plans to "dynamically optimise" its imports in response to record-low oil prices and subdued demand. The aim is to downsize capital spending this year from a previously planned 295 billion yuan ($41bn).

The state-controlled company in early May reported a net loss of 16.23 billion yuan ($2.29bn) for Q1-2020 versus a profit of 10.24 bllion yuan ($1.44bn) in the prior-year quarter. Production targets have been lowered in the wake of the coronavirus crisis, as PetroChina's crude oil throughput at refineries fell by 9.6% at the height of the pandemic, reducing profits.

Natural gas output increased 8.7% to 1,086.9 billion cubic feet (bcf), driven by capacity build-out.

Petronas supplies LNG in ISO containers to China

Malaysia's state energy company Petronas has signed a sales and purchase agreement with Tiger Clean Energy to fill LNG into ISO containers at a tank filling facility at Sarawak, Borneo, for onward shipment to China.

The LNG-filled containers would subsequently be trucked to remote locations in China without access to the country's national gas pipeline grid.

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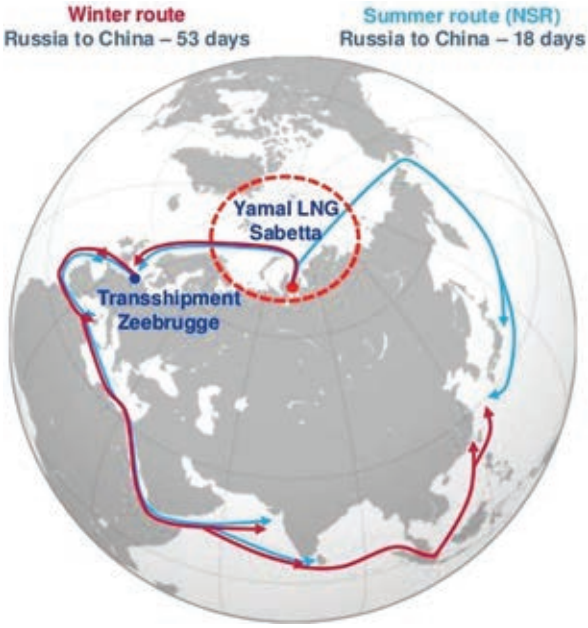
First cargo from Yamal LNG on route to China via Northern Sea Route

With the Northern Sea Route from Arctic Russia to North Asia opening up earlier this year, the first LNG cargo is on route from Novatek's Yamal LNG export terminal to China. The arctic-class carrier 'Christophe de Margerie' left Yamal LNG on May 18 and is due to arrive at the Tangshan import terminal, operated by PetroChina, on June 11.

Shipping data shows that the 'Christophe de Margerie' LNG tanker is accompanied by another tanker and two nuclear-powered ice-breakers, the 'Yamal' and the 'Vaygach'. The transit of the Northern Sea Route is expected to take 23 days.

The warming of sea waters is melting the ice in the Russian Arctic earlier each year, allowing more and more LNG carrier to deliver cargoes to customers in Northern Asia. The Northern Sea Route starts east of the Novaya Zemlya archipelago and specifically runs along the Russian Arctic coast from the Kara Sea to the Bering Strait to enter the Northern Pacific Ocean.



Second carrier could arrive mid-June

A second liquefied natural gas carrier is heading for China after the early re-opening of the sea route from Arctic Russia to North Asia and could arrive as early as June 16.

'Christophe de Margerie' LNG tanker

The 172,600 cubic metres capacity Arc7 LNG carrier "Vladimir Voronin" left the port of Sabetta with a cargo from the Yamal LNG plant on May 24 and is apparently heading for the port of Tianjin in northeast China, according to shipping data. The "Vladimir Voronin" could arrive at Tianjin port by June 16 after the normal transit time from the Yamal plant in northern Siberia of around 23 days.

Europe-Asia arbitrage window re-opens

Analysts say this year's early availability of the Northern Sea Route, combined with a slowly opening LNG arbitrage window between Europe and Asia, is will likely lead to the redirection of several Yamal LNG cargoes towards North Asian markets, especially China.

The Platts Japan-Korea Marker for LNG spot prices for July was last seen at $2.280/MMBtu and at $2.425/MMBtu for August, substantially higher than in early May. The rebound in Asian gas prices comes as European prices at the UK National Balancing Point (NBP) and the Dutch Title Transfer Facility (TTF), had eased off towards $1.40/MMBtu and $1.55/MMBtu, respectively. ■

Financing comes forward Avenier's China-built LNG carriers

Avenir LNG has obtained debt financing to meet the remaining payments on delivery of six small-scale LNG carriers under construction in Asia. The company, owned by three Norwegian shipping firms, said it signed a term sheet for a debt facility of up to $108.3 million, which it expects to be closed prior to 30 June 2020.

In addition to the debt financing, Avenir's shareholders have also committed to invest an additional $72M to fulfil the group's capital commitments. "Failure of the shareholders to do this, could result in uncertainty over the group's ability to continue as a going concern," the company noted. It disclosed the total cost for all ships will be approximately $280 million, including site team costs and capitalised interest which are recorded in construction in progress.

New tankers to be delivered in 2020/21

Majority-owned by Stolt-Nielsen along with Golar and Höegh LNG, Avenir has four 7,500 cubic metres capacity LNG vessels and two 20,000 cubic metre capacity carriers on order. The company underlined in its latest annual report the six small-scale carriers were still on track for delivery in 2020 and 2021.

Keppel Marine of Singapore is scheduled to deliver two 7,500 cubic metre LNG vessels by June or July, from its affiliated yards in Nantong, China.

In 2021, Sinopacific Offshore & Engineering will deliver two further 7,500 cubic metres capacity carriers as well as two with 20,000 cubic metres capacity from their yards, also in Nantong. Each of the ships is designed to perform safe ship-to-ship bunkering. ■

Christening of one of Avenir's LNG tankers

Chinese LNG Demand Outlook

Total of 1.80mmt on the water with a delivery horizon of 7th July, with more than half due in the North China region. Three cargoes originated in the United States whilst Russia resumed exports via the Northern Sea Route through the Arctic.

North China

Of total LNG currently en route to China, we are anticipating 0.91mmt to be delivered to North China – comprising the wider Beijing area and China's industrial north – with a delivery horizon of 7th July.

Arc7 *Christophe De Margerie* breaks ice en route to China

Current market visibility indicates at least 0.14mmt are destined for PetroChina's Caofeidian LNG by 11th June, comprising two cargoes deriving from Russia's Sakhalin-2 LNG via the *Grand Elena* (0.06mmt) and Yamal LNG via the *Christophe De Margerie* (0.08mmt). Notably, the Arc7 ice-class *Christophe De Margerie* successfully traversed the Eastbound ice-covered part of the Northern Sea Route on 1st June, our data show. Shipping in Russia's Arctic can only be undertaken during the warmer months of the year and is off-limits to most regular shipping without icebreaker support. Yamal LNG's operator Novatek commissioned a roster of ice breaking Arc7 carriers to unlock the ability to travel the Northern Sea Route independently to save time exporting Yamal's LNG to North Asia.

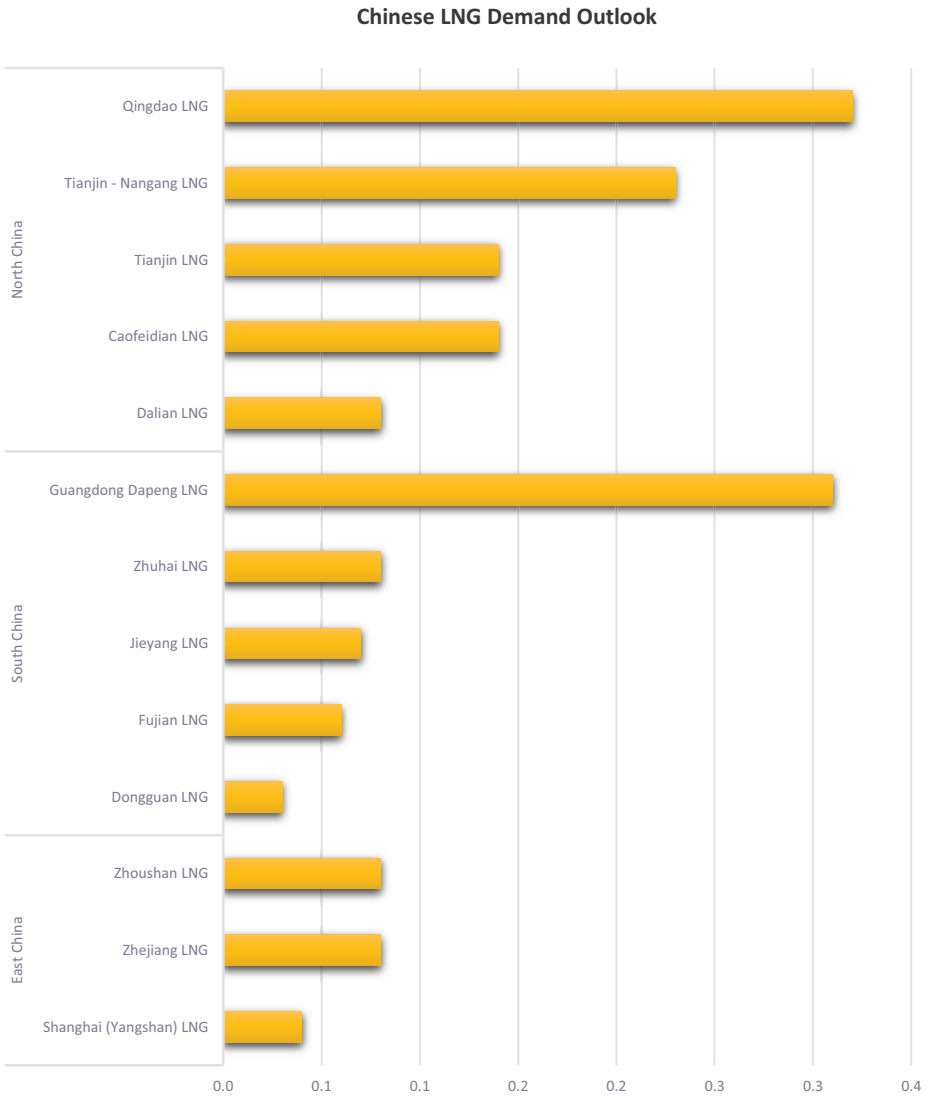
Meanwhile, PetroChina's Dalian LNG is looking to receive 0.08mmt by 6th June, taking an 8.79% share of LNG headed to the region. The Australian cargo was exported by Australia Pacific LNG on 27th May via the *Castillo de Caldelas*.

At the North China region's southernmost border, expected deliveries to Qingdao LNG comprise three Australian cargoes via the *CESI Wenzhou* (0.08mmt), the *CESI Beihai* (0.08mmt) and the *CESI Qingdao* (0.08mmt), which are scheduled to arrive by 10th June. The three cargoes were also shipped by Australia Pacific LNG during the second half of May. Additionally, the *Gigira Laitebo* (0.08mmt) is carrying a PNG LNG cargo with an expected arrival on 8th June.

Some US LNG continues to flow into China

Tianjin and Tianjin-Nangang LNG, meanwhile, are also looking to receive two and three cargoes, respectively, by 7th July. Notably, the last cargo to arrive within that time frame is the *Flex Ranger* carrying a Corpus Christi LNG cargo to Tianjin-Nangang, our LNG Market Tracker data indicates. Meanwhile, the *Diamond Gas Sakura* (0.07mmt), carrying a Cameron LNG cargo to Tianjin-Nangang, is scheduled to arrive by 10th June. The trade thus marks the continuation of US LNG flows to China in June after US exports to the country resumed in March. Among other cargoes en route, the Arc7 carrier *Vladimir Voronin* (0.08mmt) is also carrying a Yamal cargo to Tianjin-Nangang via the Northern Sea Route whilst the *LNG Kano* (0.07mmt) is carrying a Nigerian cargo to Tianjin LNG.

Meanwhile, we expect the *Maran Gas Coronis* and the *Maran Gas Chios* to deliver cargoes of 0.06 and 0.08mmt to a yet to be identified terminal in China by 6th and 16th June, respectively. The former departed Indonesia's Bontang plant on 26th April, having been forced to wait off the Philippines, whilst the is carrying a QCLNG shipment that departed Gladstone on 29th May.



Source: LNG Journal

East China

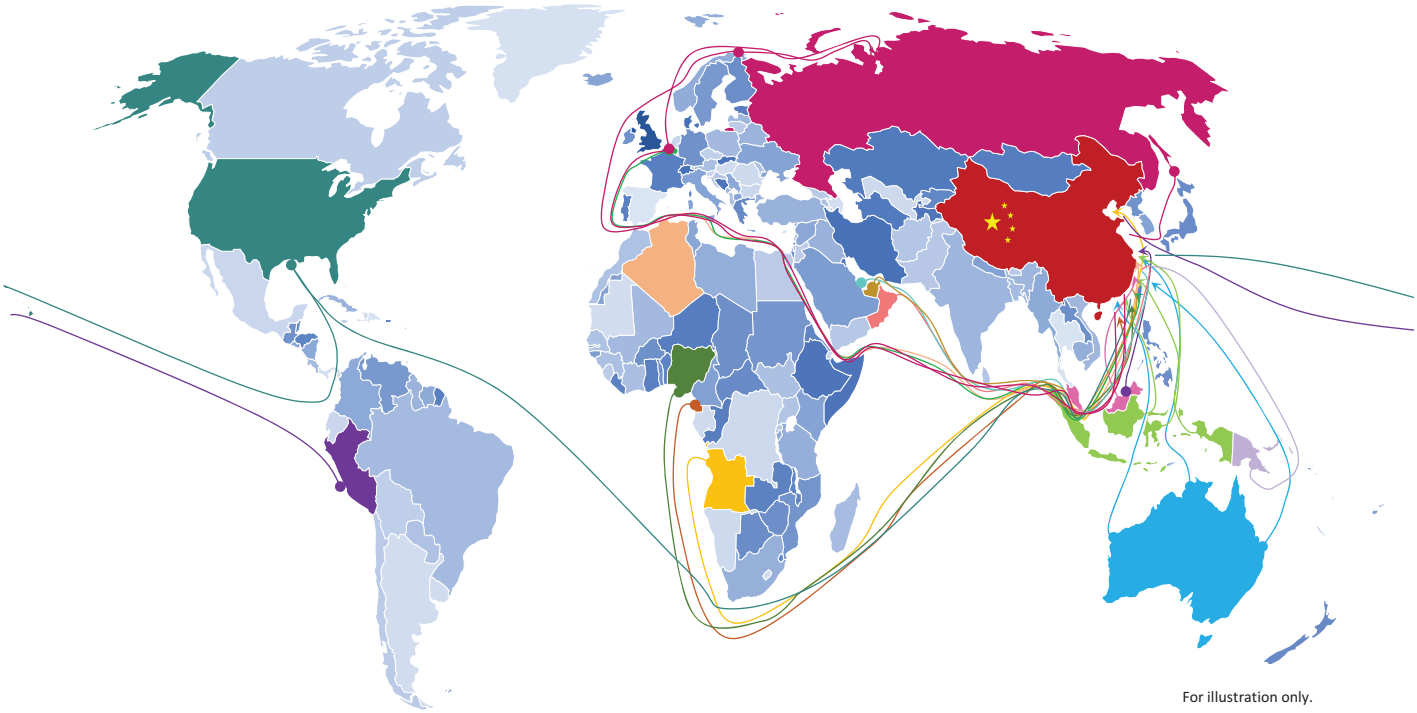
We currently see the East China region – comprising the wider Shanghai area and Zhejiang province – to receive 0.20mmt by 22nd June. Zhoushan LNG is scheduled to receive 0.08mmt from Freeport LNG in the United States via the *Nohshu Maru* by 22nd June. Moreover, we see one Australian cargo

aboard the *Maran Gas Hydra* (0.08mmt) due at Zhejiang LNG on 3rd June as well as a Malaysian cargo travelling to Shanghai LNG via the *Arctic Spirit* (0.04mmt). At the time of writing the *Arctic Spirit* was indicating arrival on 6th June.

South China

In the south of the country, we are currently expecting 0.55mmt to be delivered by 23rd June, led by two Bontang LNG cargoes aboard the *GasLog Singapore* (0.07mmt) and the *Oceanic Breeze* (0.07mmt). We expect the two vessels to arrive at CNOOC's Guangdong Dapeng and Jieyang LNG terminals by 23rd June. Meanwhile, Australia had three cargoes at sea to the South China region – sailing from Ichthys LNG, NWS LNG and QCLNG – and which we expect to arrive at Guangdong Dapeng an Zhuhai by 6th June. Qatar's Q-Flex *Umm al Amad* (0.09mmt), meanwhile, was also en route to Guangdong whilst the *LNG Lerici* (0.03mmt) was carrying a Singaporean re-export to Dongguan LNG. Finally, we see the *Min Rong* (0.06mmt) delivering an Indonesian Tangguh shipment to Fujian LNG by 3rd June.

Chinese Demand in April and May



For illustration only.

China's m/m LNG offtake grew by 0.42mmt in May, increasing robustly by 7.17% to 6.28mmt. Monthly Chinese offtakes had also grown by 1.48mmt (33.8%) in April, meaning that the country maintained the demand growth trajectory it had embarked on in March. Most of January and all of February were affected by wide-ranging public health measures to counter the country's coronavirus outbreak, which shut down significant parts of the Chinese economy at the time.

Accordingly, demand in May this year exceeded the demand level seen in May 2019, allowing overall Chinese LNG offtakes to show a robust y/y growth of 0.62mmt (12.4%). This in turn translated into capacity utilisation of 89.51% in May, an increase of more than 19pp y/y.

LNG predominantly fuels China's industrial sector, meaning demand is strongly linked to economic growth. As such, the clampdown on industrial and social activity through COVID-19 related quarantine measures curtailed gas demand. China's official manufacturing index plummeted to the record low figure of 35.7 in February but rebounded to 52.0 in March. Notably, the 50-point level represents the tipping point between economic contraction and expansion. China's PMI has since decreased to 50.8 in April and 50.6 in May, National Bureau of Statistics data shows. In our view, economic downturns in most parts of the world are weighing on demand for Chinese exports, tempering the initial jump-start of the Chinese economy. Accordingly, the country's monthly LNG demand growth also weakened from almost 34% in April to 7.2% in May. Consequently, whilst rebounding impressively over the past three months, sustained Chinese LNG demand at current levels is likely to depend on the extent lockdowns among buyers of Chinese goods are going to be eased.

Prices

Chinese gas prices followed record-low spot LNG prices

Despite the jump in demand, Chinese domestic LNG prices continued to fall following a small increase immediately after the restart of industry in March. Privately quoted prices

were thus still declining from November's peak of $13.42/mmBtu to a low of $7.14/mmBtu in May. Although in the wake of factory restarts domestic prices quickly grew to around $9.38/mmBtu at the end of March – broadly on par with prices seen the second half of January – the price climb was halted at $9.41/mmBtu on 30th March. Domestically traded LNG has since declined to around $7.14/mmBtu.

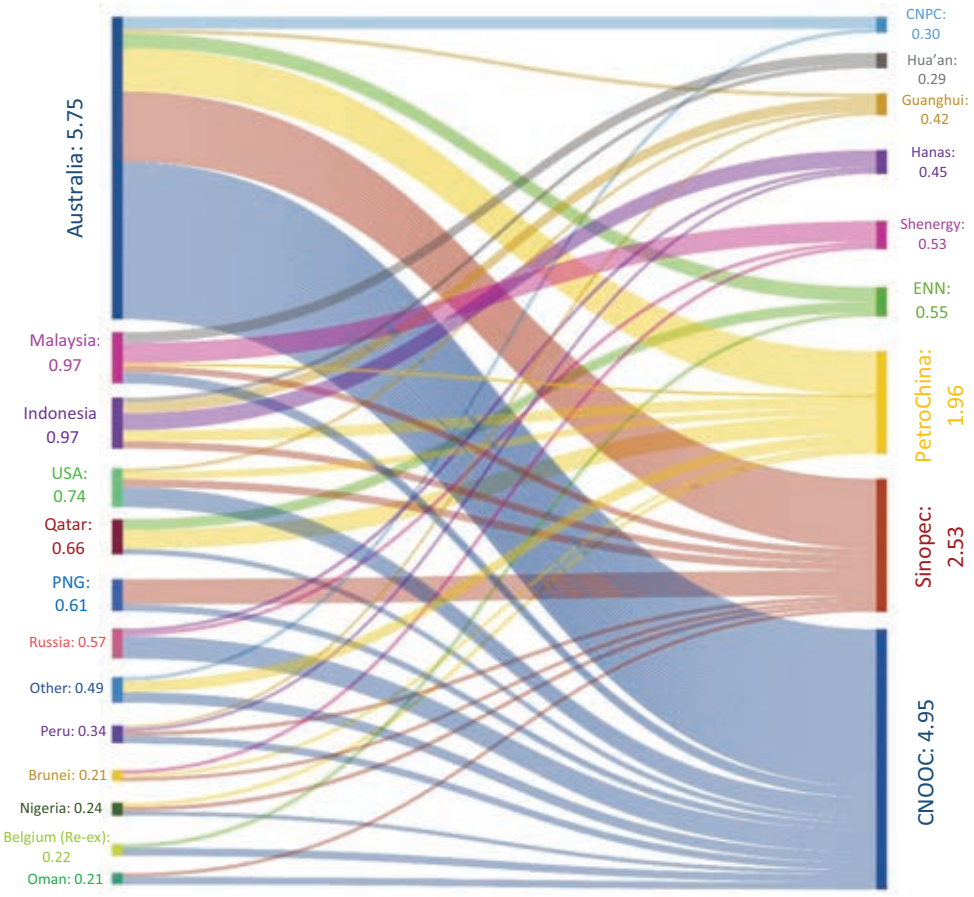
Meanwhile, the average domestic price indicated by the National Bureau of Statistics (CNBS) stood at $8.77/mmBtu on 30 April and decreased to $8.05/mmBtu as of 20 May, the latest available data point. As such, China's average domestic LNG price of $9.00/mmBtu in April was 4.5% lower than in March, whilst the average price up until 20th May fell further to $8.27/mmBtu, which was down 8.11% m/m.

Nevertheless, we highlight that there is a lag in the statistical data published by the Chinese government whilst privately quoted domestic prices are clearly trending downwards further, signalling an average May price of well below $8/mmBtu. Notably, landed LNG saw an average price of $6.74/mmBtu in May, according to Chinese customs data.

Higher pipeline gas availability has fed into demand growth

Overall, therefore, China's domestic LNG prices continue to be subject to considerable downwards pressure but more due to the prevailing historically low LNG prices than lacking demand. Notably, Chinese customs data indicates pipeline gas prices have seen a considerable jump in April, moving up by $1.16/mmBtu m/m. This to us underscores the current state of Chinese gas demand more than LNG prices considering the global LNG price context. According to our analysis, pipeline capacity utilisation stood at 156% based on a monthly breakdown of annual nameplate capacity in conjunction of Chinese customs data. This includes new capacity from Gazprom's Power of Siberia pipeline, which completed scheduled maintenance in April.

Chinese LNG Buyers



Source: LNG Journal

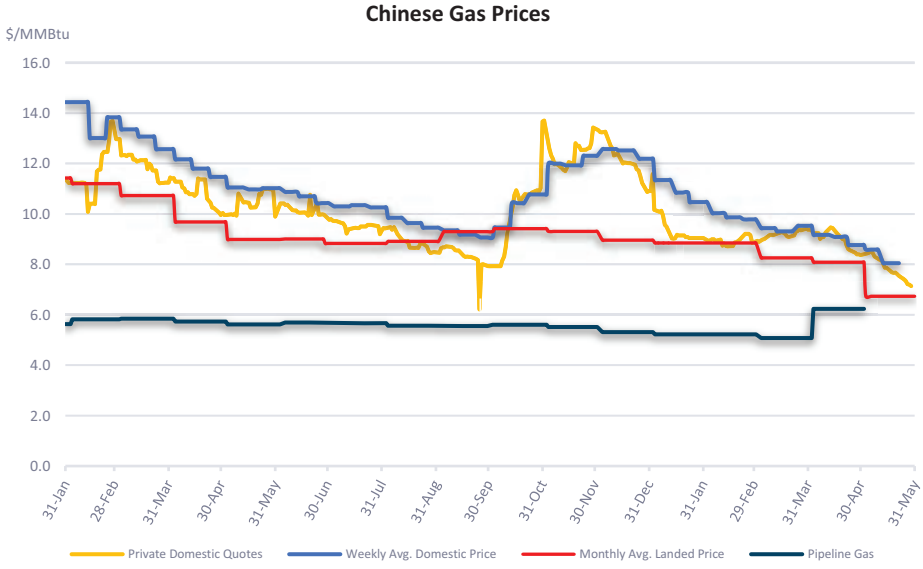
North China

Chinese demand saw significant monthly growth in the north of the country, increasing by 0.22mmt from 1.95mmt in March to 2.17mmt in April. In May, however, monthly demand growth in the north vanished as overall offtakes decreased slightly by 0.08mmt (-3.69%) to 2.09mmt.

China's North led by Tianjin-Nangang LNG

Leading the roster of northern terminals by volume imported, Tianjin-Nangang LNG took in 0.68mmt in May, consisting of four Australian cargoes totalling 0.30mmt that were delivered by the *Kita LNG* (0.07mmt), the *Hoegh Gannet* (0.08mmt), the *CESI Wenzhou* (0.08mmt) and the *Asia Excellence* (0.07mmt) between 4th and 15th May. Meanwhile, Russia delivered one cargo from its Sakhalin-2 LNG plant via the *Ob River* (0.07mmt). The United States, Nigeria, Equatorial Guinea and a re-export from Zeebrugge comprised the remaining four cargoes, which arrived between 12th and 30th May via the *BW Lilac* (0.06mmt), the *Maran Gas Spetses* (0.07mmt), the *Gaslog Houston* (0.08mmt) and the *Clean Vision* (0.07mmt), respectively. However, Tianjin-Nangang LNG still decreased its monthly LNG offtake by

Chinese Gas Prices



Source: LNG Journal, CNBS, GACC, Domestic Traders

0.11mmt (-13.9%) in May, pegging capacity utilisation at 76%.

Tianjin LNG saw highest m/m regional growth rate in May

Meanwhile, Tianjin LNG continued to lead regional offtake growth by terminal, increasing imports by 0.06mmt (18.8%) from 0.32mmt in April to 0.38mmt in May. Australia was the principal supplier of LNG here with May imports amounting to a total of 0.32mmt, all from Gorgon LNG. A similar dynamic was also observed in March, whereby Australian plants shipped 0.20mmt out of the total of 0.41mmt imported by Tianjin LNG at the time. The remaining May deliveries to Tianjin LNG were performed by the *Golar Tundra*, which arrived with a 0.07mmt cargo from Sabine Pass LNG in the United States. Additionally, the *Ibra LNG* shipped 0.07mmt from Oman.

Caofeidian LNG saw monthly offtakes decline

Caofeidian LNG, meanwhile, saw monthly offtakes decline by 0.07mmt from 0.29mmt in April to 0.22mmt in May (-24.1%). The terminal had been among the few that saw capacity utilisation increase at all from February to March. Utilisation in April and May, however, roughly halved compared to the two preceding months. We think deliveries derived mainly via spot trades with the *LNG Lagos II* (0.08mmt) and the *Seri Balhaf* (0.07mmt) delivering a Nigerian and Angolan cargo on 7th and 22nd April, respectively. The month of May, meanwhile, only saw one import at Caofeidian via the *Asia Vision* (0.07mmt) delivering a Wheatstone cargo on the 30th.

Dalian and Qingdao LNG

The remaining two northern terminals – Dalian LNG and Qingdao LNG – imported 0.21 and 0.56mmt in April, respectively, but which declined slightly to 0.19mmt in May in the case of Dalian. Qingdao, meanwhile, continued to grow offtakes, increasing imports to 0.62mmt in May.

Dalian LNG procured its LNG in May from Australia and Qatar via the *Cool Voyager* (0.07mmt) and the Q-Max *Bu Samra* (0.12mmt). Supply to Qingdao comprised contracted volumes, with Australia constituting the majority of its May offtakes (0.38mmt) split between five cargoes out of APLNG with three further cargoes supplied by Papua New Guinea aboard the *Spirit of Hela* (0.08mmt) and the *Papua* (0.08mmt). Notably, Dalian saw relatively low utilisation in May of below 40% whilst Qingdao continued to work flat-out.

East China

Demand in East China was dominated by the coastal province of Zhejiang south of Shanghai, where Zhejiang LNG imported 0.56mmt in both April and May. This constituted robust growth of 0.18mmt (47%) over March. Accordingly, the terminal operated at above nameplate capacity during both April and May. Zhejiang LNG's offtakes were hit particularly hard during February, when the terminal imported only 0.14mmt as lockdown measure – which were first seen in the East China region – began to bite.

Zhoushan LNG

Its neighbouring terminal Zhoushan LNG, meanwhile, also saw robust m/m growth of 0.07mmt (29%) in May as private operators were swept up in the general increase in gas demand, we think. Zhoushan LNG is one of the few LNG import terminals not controlled by one of the state-owned petrochemical giants PetroChina, Sinopec and CNOOC.

Wider Shanghai area boosts capacity utilisation

Meanwhile, the wider Shanghai area – comprising Jiangsu LNG, Qidong LNG, Shanghai LNG and the metropolis' peak-shaving facility – imported a total of 1.08mmt in May. This constituted growth of 0.18mmt (20%) over the 0.90mmt imported during April. The sub-region's growth was led by Jiangsu LNG, which increased m/m imports by 0.07mmt (20%) to 0.42mmt in May. The terminal had previously decreased by c. 22% to 0.37mmt in March and to 0.35mmt in April. Overall capacity utilisation for the wider Shanghai area was therefore increase by c. 15pp to 94.7% in May from around 77% in March.

South China

Regional imports in South China – where LNG demand is primarily determined by the southern industrial centre of Shenzhen – saw m/m demand increase considerably in May in line with the rest of the country. Overall demand in the region grew by 0.25mmt (12.56%) to 2.24mmt in May from 1.99mmt in April and 0.98mmt in March.

Southern demand growth led by Fujian LNG in May

Although total offtake volumes were led by Beihai LNG with 0.3mmt, m/m growth in May was led by Fujian LNG after the terminal was put back into full service in April following maintenance. The terminal almost doubled monthly imports from 0.20mmt in April to 0.39mmt in May after offtakes in March had amounted to 0.18mmt. Fujian LNG's capacity utilisation thus stood at 74% in May.

Shenzhen area back to full capacity utilisation

At the same time, the region's most prominent terminal – Guangdong Dapeng LNG – also saw offtakes increase by 0.08mmt to 0.83mmt in May whilst its neighbouring Shenzhen Diefu LNG, the Shenzhen Peak-shaving terminal as well as Dongguan LNG increased total offtakes by 0.05mmt. In March and April these terminals imported 0.60mmt and 0.86mmt, respectively, thus showing robust growth to 1.05mmt in May. Capacity utilisation for the Shenzhen area thus stood at slightly above nameplate capacity.

Beihai LNG also firing on all cylinders in May

As anticipated, Beihai LNG saw renewed demand growth in April after having remained absent from the market in March. The terminal boosted offtakes to 0.35mmt in April but did not continue on that growth trajectory in May when offtakes flattened off at 0.30mmt. This can be explained by the terminal's high capacity utilisation in May, which stood at 120%.

Zhuhai LNG

Zhuhai LNG imported 0.20mmt in May – showing broadly steady m/m demand – whilst Jieyang curtailed offtakes by 0.09mmt (-56%) to just 0.07mmt. Jieyang LNG was absent from the market in both February and March and has suffered from frequent periods of inactivity since its commissioning in 2017. At Zhuhai, capacity utilisation stood at 71% in May, up from the 22% seen in March, whilst Jieyang's utilisation was at 42%, unchanged since March.

Hainan Island back to normal

The remaining two regional LNG terminals on Hainan Island – Hainan LNG and the Hainan Transfer Station – saw demand recover following a severe reduction in February and March. In both April and May, the Transfer Station returned to receiving its regular cargoes via the *Lucia Ambition* (0.01mmt), whilst its larger counterpart on the island – Hainan LNG – grew May imports to 0.20mmt from 0.18mmt in April and 0.14mmt in March. Hainan LNG capacity utilisation thus stood at 80% in May.

Region	Terminal	Export Basin			May	April	% Change m/m	May Utilisation
		Atlantic	Middle East	Pacific				
North	Caofeidian LNG	0.15	-	0.07	0.22	0.29	-24.1%	41%
	Dalian LNG	-	0.12	0.07	0.19	0.21	-9.5%	38%
	Qingdao LNG	-	-	0.62	0.62	0.56	10.7%	248%
	Tianjin - Nangang LNG	0.31	-	0.37	0.68	0.79	-13.9%	76%
	Tianjin LNG	0.07	0.07	0.24	0.38	0.32	18.8%	63%
East	Jiangsu LNG	0.07	0.12	0.23	0.42	0.35	20%	144%
	Jieyang LNG	-	-	-	-	-	-	-
	Qidong LNG	0.07	-	0.22	0.29	0.19	53%	290%
	Shanghai LNG	-	-	0.25	0.25	0.28	-11%	100%
	Shanghai Peak-Shaving	-	-	0.12	0.12	0.08	50%	24%
	Zhejiang LNG	-	-	0.56	0.56	0.56	0%	224%
	Zhoushan LNG	0.07	0.10	0.14	0.31	0.24	29%	124%
South	Beihai LNG	0.08	-	0.22	0.30	0.35	-14%	120%
	Dongguan LNG	-	-	0.08	0.08	0.08	0%	133%
	Fujian LNG	0.07	-	0.32	0.39	0.20	95%	74%
	Guangdong Dapeng LNG	-	0.07	0.76	0.83	0.75	11%	146%
	Hainan LNG	0.08	0.06	0.06	0.20	0.18	11%	80%
	Hainan Transfer Station	-	-	0.03	0.03	0.02	50%	36%
	Jieyang LNG	0.07	-	0.07	0.07	0.16	-56%	42%
	Shenzhen Diefu LNG	0.08	-	-	0.08	-	-	24%
	Shenzhen Peak-Shaving	-	-	0.06	0.06	0.03	100%	90%
	Zhuhai LNG	0.07	-	0.13	0.20	0.22	-9%	71%
	Total	**1.19**	**0.54**	**4.62**	**6.28**	**5.86**	**7.17%**	**89.51%**

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