

LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS

6 February 2020

Chinese LNG concerns offered *force majeure*

Uncertainty over China's LNG future demand has grown following its decision to offer *force majeure* certificates to domestic companies.

The certificates will be made available if companies are unable to fulfill their international contractual obligations due to the coronavirus outbreak.

Beijing's decision adds to concerns over demand from the world's second largest LNG importer and the bearishness in the north Asian markets exacerbated by oversupply leading to falling prices, Platts reported.

It was believed that the major LNG importers, including CNOOC, were mulling over whether to take advantage of the certificates.

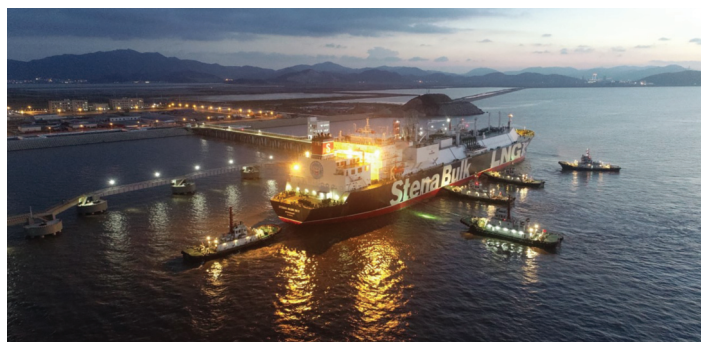
If reduced industrial activity across Hubei Province lasts to the end of February, it would reduce Chinese LNG demand by 5-7% relative to the S&P Global Platts Analytics base case, which would lower Chinese LNG imports.

While coal to gas switching in the residential sector has played a large role in China's recent LNG demand growth, the driver behind the country's gas demand remains the industrial sector.

Between 60% and 70% of China's total LNG imports are ultimately destined to end users in the industrial sector, depending on the degree of weather related demand.

On Monday, Platts JKM plunged to an over 10-year low, falling to \$3.512/MMBtu for March, the lowest since records began in February, 2009 on slow demand and a wave of new supply from Australia and the US.

China's move is aimed at protecting the interests of domestic companies and helping mitigate losses, but its impact on LNG markets is unclear, including the like-



Chinese importers may be able to claim *force majeure*

lihood of Chinese LNG importers exercising *force majeure*, the protection such a declaration would offer and the implications it would have for international LNG sellers.

"It might take some time for China to be able to justify this virus outbreak as *force majeure*," S&P Global Platts Analytics spokesperson said. "While it might affect a buyer's ability to fulfill its contractual obligations, most of the long-term contracts have an annual volume commitment that can be postponed to later in the year, so it might be early for Chinese companies to justify and obtain reliefs from performance. The key still lies in to what extent China can demonstrate that the contractual requirement cannot be fulfilled."

Proof needed

With their application for *force majeure* certificates, Chinese companies would need to provide proof of delivery delays or cancellations, sales contracts or agreements, as well as customs declarations, the China Council for the Promotion of International Trade said in a statement last Thursday.

Although it is a bit early to

gauge, Chinese end users could be delaying February cargo deliveries amid high inventories and a poor outlook on downstream demand stemming from the virus outbreak, sources told Platts.

Concerns were also expressed over possible port closures if the situation worsens. A Chinese LNG end user said it might adjust its LNG procurement schedule going forward while it continues to assess the effects of the virus outbreak.

"Demand for LNG will be greatly affected," the unnamed end user told Platts. "There is a decline in residential gas demand, gas power generation and traffic. If the epidemic lasts until May, I think the LNG growth rate will be a single digit."

Last week, ports closed and economic activity slowed in Hubei province, an important industrial hub and demand centre for regasified LNG.

Hubei sources regasify LNG from terminals in the Shanghai region, which account for around 8% of Chinese LNG imports. Elsewhere, Chinese national and provincial officials have mandated that commercial and public activities shut through February. ■

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China's receiving terminals expanding

Chinese state-owned gas distributor Beijing Gas Group has obtained the government's approval to build a 5 mill tonnes per year LNG receiving terminal at Nangang district, Tianjin city.

This terminal will add new LNG receiving capacity to the Bohai Rim region - the most natural gas consuming region in China.

Natural gas consumption was estimated to be around 67 bill cu m in the Bohai Rim region last year, up 10.6% year on year, accounting for around 22% of China's total gas consumption of 304 bill cu m in 2019, according to data

from state-owned CNPC's Economics & Technology Research Institute.

China's Bohai Rim region includes two municipalities - Beijing, Tianjin, and three provinces - Hebei, Shandong and Liaoning.

The project was said to have been approved by China's National Development and Reform Commission on 14th January and is ex-

pected to start operations at the end of 2022.

Beijing Gas' Tianjin LNG receiving terminal will be an emergency peak-shaving reserve project, which comprises the construction of 10 storage tanks of 200,000 cu m each, a dock capable of receiving LNGCs of up to 260,000 cu m, and a 229-km pipeline linking the terminal with its gas storage tanks in Beijing, an official said at a Beijing conference in October, 2019, according to newswire reports.

Apart from the newly approved Tianjin LNG terminal, Beijing Gas also joined PetroChina in the construction of Phase 3 of the Tangshan LNG terminal, which is expected to complete by the end of 2020, according to PetroChina.

Currently, there are five LNG receiving terminals located in the Bohai Rim region with a total LNG receiving capacity of 30 mill tonnes per year, S&P Global Platts data showed.

They are state-owned CNOOC's

2.2 mill mill tonne per year FSRU, Sinopec's 10.8 mill tonne LNG terminal in Tianjin, Sinopec's 5 mill tonne LNG terminal in Shandong Qingdao, PetroChina's 6.5 mill tonne LNG terminal in Hebei Tangshan, and PetroChina's 5.5 mill tonnes per year LNG terminal in Liaoning Dalian.

Besides Beijing Gas' new LNG terminal project, CNOOC, Sinopec and PetroChina are all expanding their existing Tianjin, Qingdao and Tangshan LNG terminals, of which Sinopec and PetroChina's expansion projects are expected to be completed by the end of this year, while CNOOC's expansion project is due by 2022, according to the three companies, Platts reported.

Once all of these these projects come on stream as scheduled, LNG receiving capacity in the Bohai Rim region is estimated to be around 40 mill tonnes per year by 2022, up more than 30% from the current 30 mill tonnes, Platts data showed. ■



China is continuing to ramp up its import terminals

Magnolia project moves forward

On 24th January, the US Federal Energy Regulatory Commission (FERC) issued the Supplemental Final Environmental Impact Statement (FEIS) for the production capacity amendment to LNG Ltd's (LNG) Magnolia LNG project.

Magnolia LNG's production capacity amendment, filed with FERC on 19th November, 2018, would increase the total authorised production capacity from the currently 8 mill tonnes per annum to 8.8 mill tonnes.

According to FERC's Notice of Schedule for Environmental Review issued on 26th June, 2019, the au-

thorisation decision deadline for this application is 23rd April, 2020.

LNG's Executive Chairman, Managing Director and CEO, Greg Vesey, said, "We thank FERC and other federal agencies for their continued diligence and review of Magnolia LNG's Production Capacity Amendment, and we look forward to receiving the federal authorisa-

tion on schedule in April."

In another move announced earlier, LNG and DeltaOE signed a non-binding memorandum of understanding (MOU) for the delivery of 2 mill tonnes per annum of US LNG from Magnolia to the Vietnamese Bac Lieu power project.

DeltaOE is negotiating a 25-year power purchase agreement

(PPA) with Electricity Vietnam Group (EVN) to underpin the Bac Lieu project, and concurrently progressing a binding sale and purchase agreement (SPA) with LNG for the LNG from Magnolia.

Once agreed, the SPA will remain subject to LNG making a Financial Investment Decision (FID) on Magnolia. ■

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Finance and politics to dictate Africa's LNG future

Following the news that Eni has signed an LNG supply agreement with Nigeria LNG (NLNG) (see page 4), Cao Chai, GlobalData's Upstream analyst, examined African LNG projects currently under development.

With the announcement of the long-awaited final investment decision (FID) on Nigeria LNG Train 7 at the end of last year, Africa is expected to have a total liquefaction capacity of around 44 mill tonnes per annum by the mid-2020s, she said.

Nevertheless, the progression and delivery of the planned and announced LNG projects are dependent on the field development costs, fiscal terms, political and security risks, she warned.

While positive signs reflect progress with projects in some countries, such as greenfield on-shore LNG projects in Areas 1 and 4 of Mozambique, cross border

Tortue FLNG in Senegal and Mauritania and the expansion of Nigeria LNG Train 7, massive delays are observed in Sub-Saharan Africa's other major planned and announced LNG projects and not all of these developments can move forward.

The upstream sector has become much more selective in making major investment decisions. The competitiveness of an LNG project is largely based on its feed gas supply and upstream cost, cost of the liquefaction plant and shipping, fiscal and regulatory regimes as well as political uncertainties.

Cameroon's potential second FLNG project operated by New

Age (African Global Energy) now appears doubtful given the limited reserves base and cost of a standalone FLNG export facility. Djibouti's \$4 bill FLNG project operated by China's POLY-GCL, which looked to develop capacity of around 3 mill tonnes per annum fed from gas fields in Ethiopia's Ogaden Basin, also appears to have stalled, due to financing difficulties, she said.

Fortuna FLNG in ultra-deepwater Equatorial Guinea did not move forward as Ophir Energy failed to secure finances before the licence expired at the end of 2018; Lukoil recently won the block in the country's offshore li-

censing round and the development plan is now under discussion again. The capital intensive on-shore LNG project Lindi in Tanzania has been held up for many years, mainly due to the country's political uncertainty and delays in the approval of a new legal and regulatory framework.

Natural gas infrastructure in Sub-Saharan Africa is sparse and the absence of a large regional market will also increase the risks of making major investment decisions on the LNG developments. However, project financing and political risks remain major constraints for these potential projects, Chai concluded in a report. ■

Larger FSRU to serve Port Qasim

Excelerate Energy and Engro Elengy Terminal Ltd (EETL) have signed a Heads of Agreement (HOA) to expand Port Qasim's EETL liquefied natural gas (LNG) import terminal.

Under the agreement, Excelerate will swap the existing FSRU 'Exquisite' with a newbuild FSRU, Hull 2477, which is currently under construction at Daewoo Shipbuilding and Marine Engineering (DSME).

Hull 2477 will increase EETL's send-out capability by more than 150 mill standard cu ft per day and increase its LNG storage capacity from 150,900 cu m to 173,400 cu m.

Excelerate will take delivery of Hull 2477 in April this year, and the expanded operations will begin before this winter.

"We are proud to partner with

Engro and Vopak on this expansion to help meet the growing demand for natural gas in Pakistan. We continuously work with our customers to ensure our terminals adjust to the changing needs of their markets," Excelerate CCO, Daniel Bustos, said. "In the nearly five years of essentially non-stop operations in Pakistan, we have a proven track record of safe and reliable operations at peak performance."

EETL CEO, Jahangir Piracha, added; "Excelerate Energy has been an excellent partner who has made it possible for EETL to cater to such a high level of utilisation of our regasification capacity. It is

our trust in their operational excellence that we are now jointly undertaking the expansion of our terminal."

The EETL terminal, Pakistan's first floating LNG import terminal, began operations in March, 2015. It has been delivering up to 690 mill cu ft per day of natural gas directly into Sui Southern Gas Co's natural gas pipeline system.

'Exquisite' currently fulfills as much as 15% of Pakistan's domestic daily natural gas requirements and is recognised as the most utilised FSRU worldwide. EETL has imported over 275 LNG cargoes to date.

EETL is a joint venture between Engro Corp and Dutch-based Royal Vopak of the Netherlands.

In September, 2019, Excelerate and Maran Gas Maritime (MGM) signed a five-year bareboat charter agreement for Hull 2477. Excelerate also has the option to purchase the FSRU at any time during the duration of the contract. ■



The FSRU 'Exquisite' is soon to be replaced

NEWS NUDGE

Northwest Shelf sheds LNGC

Brokers have reported the sale of the 1992-built 124,905 cu m 'Northwest Seaeagle' to Japan's Karmol for an undisclosed price.

She is believed earmarked for a conversion project.

MOL in reshuffle

Mitsui OSK Lines (MOL) has announced that it will establish an Offshore Gas Project Division.

In a reshuffle, due to commence on 1st April, this division will focus on LNG related businesses in energy value chains (FSRU projects, LNG Powership business, etc).

This will accelerate the enhancement of the offshore business, in which the company is concentrating on investing in management resources, as set out in Rolling Plan 2019, MOL said.

This division will also have specific responsibilities in crude oil fields, such as FPSO projects, shuttle tanker projects, and the subsea support vessel business. ■

Qatargas delivers Indian commissioning cargo

Qatargas has supplied a commissioning cargo for India's newest LNG receiving terminal - Mundra - located on the west coast of India.

The cargo was loaded at Ras Laffan on 17th January, 2020 on the Q-Flex LNGC, 'Murwab', which arrived at Mundra on 22nd January, 2020.

Mundra is the second LNG terminal Qatargas helped commission in India within the past year. It followed an earlier commissioning cargo which was delivered to the Ennore LNG receiving terminal, near Chennai, in February, last year.

The Mundra terminal is located in Adani Ports and Special Eco-

nomic zone in the Kutch district of the western Indian state of Gujarat.

It's nominal capacity is 5 mill tonnes per annum and it can receive vessels with a capacity of between 75,000 cu m and 260,000 cu m. The terminal comprises of two storage tanks - each having an overall capacity of 160,000 cu m.

Qatargas has established a strong partnership with India since July, 1999 when it started supplying LNG to Petronet. Since then it has delivered over 2,000

cargoes under its various long-term sales and purchase agreements (SPAs), as well as supplying significant volumes into the short term and spot markets, the company said.

Developments, such as new terminals and infrastructure, will raise LNG imports to 40 mill from 30 mill tonnes per annum - a 46% increase - as India continues to make strides in achieving its ambitious target of 15% gas in the energy mix, Qatargas claimed.

In another move, Petronet LNG

is to invest \$2.5 bill in Tellurian's Driftwood LNG project.

The deal will be signed during US President Donald Trump's visit to New Delhi between 24th and 25th February, Reuters said.

Petronet will invest the money over a five-year period, which would give the Indian company the rights to up to 5 mill tonnes a year of LNG.

An initial agreement was signed during Indian Prime Minister Narendra Modi's visit to Texas City last September. ■

Novatek to build up to 42 vessels

Novatek is to invest in a \$12 bill fleet of up to 42 icebreaking carriers for the Northern Sea Route, TASS news agency reported last week.

The vessels will be used to transport the 80 mill tonnes of new production that Novatek is planning over the next decade from gas fields on the Yamal and Gydan peninsulas in northern Siberia.

Arctic LNG 2, the first of the new projects, is scheduled to start production in 2023. Two other sites - Arctic LNG 1 and 3 - are not yet under construction. Novatek is yet to confirm that

they are going ahead with a smaller production site - Ob LNG, TASS said.

The Russian government has given Novatek permission to order 10 of the new vessels from foreign shipyards, probably Chinese and South Korean, as the domestic shipyard Zvezda would not have the capacity to build all of the vessels in time for the project's first phase. ■

Nigeria LNG signs 10-year deal

Nigeria LNG Limited (NLNG) and Eni have signed a LNG Sale and Purchase Agreement (SPA) for some of the remarketed volumes from NLNG's Trains 1, 2 and 3.

The SPA is for the supply of 1.5 mill tonnes per annum for 10 years on a Delivered Ex-ship (DES) and Free on Board (FOB) basis.

This agreement advances the ongoing plans by NLNG to remarket volumes from the three trains, the company said.

NLNG is an incorporated joint venture owned by four shareholders - the Nigerian Government, represented by Nigerian National

Petroleum Corp (49%); Shell Gas (25.6%); Total Gaz Electricite Holdings France (15%), and Eni International (10.4%).

This follows the announcement of an SPA with Total Gas & Power (TGP) for remarketed volumes.

This was also for the supply of 1.5 mill tonnes per year for a 10 year term on a Delivered Ex-ship and Free on Board (FOB) basis. ■

Platts launches JKM LNG forecasts

S&P Global Platts has launched 'Platts Analytics Weekly Japan-Korea Marker (JKM) Forecast Report'.

The proprietary Platts JKM is the LNG benchmark price assessment for spot physical cargoes, the company claimed. It is powered by proprietary data and modelling from Platts Analytics and provides the expected drivers of supply and demand fundamentals and near-term outlook for JKM pricing.

In the decade since the launch of Platts JKM, Platts' focus has been to help bring increased transparency to the pricing of LNG as the market continues to liberalise and new types of price

agreements emerge between LNG buyers and sellers. LNG is one of the fastest growing commodity markets - the overall market has increased at an average of 9% over the past four years and looks to continue its expansion in 2020, the company said.

Ira Joseph, Head of Global Gas & Power Analytics, S&P Global Platts, explained: "Against the backdrop of divergence from oil-related pricing, pricing based on LNG fundamentals is increasingly important. Market participants will

need to understand what drives market fundamentals and what that means to forecast JKM prices.

"Despite Platts JKM having plunged to less than half the level it was assessed at the beginning of 2019, Platts Analytics expects further declines in 2020. Our analysis shows that this is attributed to a continued supply glut driven by new production from the US, and tepid demand growth in Asia in part driven by milder seasonal weather," Joseph said.

Key features of the report

include:

- Price forecasts through the next 10 months, updated weekly.
- Tables, charts and commentary, including best value along the forecast period.
- An outlook on JKM versus current derivatives, such as the expected spread between JKM and European gas prices.
- Analysis of the 'pull' of LNG into Northeast Asia against global gas indices and trade flows.
- Weather outlook and impact on demand. ■

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EXMAR provides financing update

SINOSURE has approved the release of around \$40 mill from the Debt Service Reserve Account under EXMAR's 'Tango' FLNG loan facility.

In the meantime, 'Tango' FLNG exported its second cargo for YPF in December, 2019 and the third cargo is currently being produced.

In addition, EXMAR has two VLGCs under construction at Jiangnan, due for delivery next year. Both vessels will be timechartered to Equinor for five years upon their delivery from the shipyard.

EXMAR has obtained and drawn under a pre-delivery financing of \$20 mill with Maritime Asset Partners, which partially covers the instalments during their construction.



EXMAR has gained finance to help with its FLNG programme

With the structural developments and extension of the bridge loans, EXMAR claimed it was in a stable cash position to cover its

current liabilities and address its future cash requirements until the effective release of the Debt Service Reserve Account (DSRA). ■

Cheniere celebrates milestone

Cheniere Energy recently produced and exported its 1,000th LNG cargo.

This milestone cargo was exported within a four-year time period after startup, setting an industry record and making Cheniere the fastest producer in the world to reach this figure, the company claimed.

The cargoes have been exported from both the Sabine Pass Liquefaction Project (SPL project) and the Corpus Christi Liquefaction Project (CCL project).

"Reaching 1,000 cargoes of LNG faster than any producer in history is a testament to the performance of our people and the culture of our company. Our focus on reliability and safety through the entire LNG production process enabled us

to reach this milestone, while fulfilling our commitments to our foundation customers," said Jack Fusco, Cheniere's President and CEO. "Cheniere will continue to focus on operational excellence to help meet growing demand for reliable, flexible, and cleaner sources of energy around the world. This achievement would not be possible without the dedication and diligence of Cheniere's employees, our partners and customers, and we look forward to celebrating cargo 10,000."

Cheniere's 1,000th cargo was loaded on 'Hoegh Galleon' which sailed on 26th January, 2020 from

Cheniere's CCL project. Cheniere also celebrated the 100th cargo produced at CCL, which left on the 'Yari LNG' on 13th January, 2020.

The SPL project consists of six natural gas liquefaction trains, five of which are fully operational and one is under construction.

The CCL project involves three trains, two of which are fully operational and one is under construction and expected to be operational in 2021.

Adjacent to CCL, Cheniere is developing and commercialising its stage 3 expansion, which recently received US federal regulatory authorisation. ■



One of Hoegh LNG's vessels lifted Cheniere's 1,000th cargo recently

Bahrain terminal online

Bahrain LNG's new terminal has been completed and commissioned.

The customer is paying Bahrain LNG as of the completion date and is sending out the last of the commissioning cargo so that the FSU 'Bahrain Spirit' can be re-deployed on short-term trades as planned.

HE Shaikh Mohamed bin Khalifa Al-Khalifa, Bahrain's Minister of Oil, commented: "The achievement of construction completion for the Bahrain LNG receiving and regasification terminal is a critical milestone for this project, which is of strategic importance to the energy sector of the Kingdom of Bahrain."

"We sincerely congratulate all parties involved in this tremendous achievement, and we look forward to the upcoming commencement of commercial operations in order to secure regasification services to the Kingdom of Bahrain," he said.

Bahrain LNG is jointly owned by Oil and Gas Holding Co and a consortium consisting of Teekay LNG Operating, Gulf Investment Corp and Samsung C&T Corp.

The terminal comprises an FSU, an offshore LNG receiving jetty and breakwater, an adjacent regasification platform, subsea gas pipelines from the platform to shore, an onshore gas receiving facility, and an onshore nitrogen production facility. ■

NEWS NUDGE

Algeria to continue to supply Turkey

Turkey and Algeria have renewed their natural gas supply agreement for another five years, local media reported, quoting Algerian energy minister, Mohammad Arkab.

Algeria accounts for 38% of Turkey's LNG supply market, Arkab was quoted as saying on the sidelines of a recent business forum. ■

Gas detection system problems

During inspections on three LNGCs in Boston (Mass), US Coast Guard Port State Control Officers (PSCOs) discovered issues with the fixed flammable gas detection system that resulted in the issuance of deficiencies and delay of cargo operations.

While witnessing tests, multiple sensors measured outside the tolerances established by the manufacturer and subsequent calibration checks failed. In each case, crew members were not following established procedures as specified in their Safety Management System (SMS).

If gas vapours are detected in a monitored space, an alarm will activate and alert the crew of the dangerous condition. The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) requires the activation of alarms at specified vapour concentrations.

Testing procedures and allowable tolerances should be understood by the crew members responsible for maintaining and testing the fixed gas detection system, the USCG said. Although the examined gas carriers' SMSs and manufacturers' instructions specified procedures for testing

the fixed gas detection systems and stated the acceptable parameters for the sensors, many of the sensor tests observed by the PSCOs had readings outside of the established tolerances.

In these types of situations, a 'drifting sensor' often causes detectors to exceed tolerances specified by the manufacturer. These pose a significant safety threat and could be grounds for vessel control actions, such as delayed departure from port, delayed cargo operations, or detention.

Another common discrepancy observed was the use of improper span gas on catalytic sensors. To prove proper operation of the fixed gas detection system, the span gas used to test the sensors or complete calibration checks must be appropriate for the type of sensor.

There are three main types of sensors: catalytic, infra-red, and electro-chemical. Catalytic sensors rely on the presence of oxy-

gen to function correctly. Tests or calibrations conducted with the incorrect span gas can cause the sensor to operate outside established tolerances.

The USCG recommended that LNGC owners and operators ensure the following:

- Testing and calibration of fixed gas detection systems are completed per the vessel's SMS and manufacturer's instructions.
- Sensors are operating within established parameters as required by the vessel's procedures and manufacturer's instructions.
- The appropriate span gas for the type of sensor is correctly applied to the sensor, as established by the manufacturer and vessel's SMS.
- The crew member responsible for maintaining the gas detection system has adequate training, is fully knowledgeable on the system, and is proficient in conducting system tests. ■

LNG cargo news

Russian oil and gas producer Gazprom has offered 18 LNG cargoes for loading at Zeebrugge, industry sources told Reuters last week.

The cargoes are due to load between the second half of this month and 31st December, 2021, one of the sources said.

The tender is due to close on 10th February, with bids valid until 12th February.

Gazprom's trading arm, Gazprom Marketing and Trading, buys 2.9 mill tonnes of LNG a year from Russia's Yamal plant, with cargoes purchased at Zeebrugge via transshipments.

Elsewhere, India's Essar Steel is seeking 36 LNG cargoes for delivery over 2021 to 2023, industry sources told Reuters.

The tender was due to close on 5th February but remains valid until 7th February.

This is probably a reissuing of an earlier tender by Essar in November last year for the same volumes and delivery period, one source said. ■

TMC wins ALS compressor contracts

TMC Compressors of the Seas (TMC) has won a contract from Hyundai Heavy Industries to deliver air lubrication system compressors to seven LNGCs under construction for Capital Gas Corp.

Under the contract, TMC will supply three marine air lubrication systems (ALS) compressors to each of the seven LNGCs, totalling 21 compressor units.

TMC will also provide its ALS control system that is integrated in a specially designed control cabinet.

The company has developed a range of marine compressors for use in combination with air lubrication systems (ALS) to help ships further reduce fuel consumption and emissions to air.

The equipment will be manufactured in Norway and shipped to Hyundai Heavy Industries.

"During the past 15 years, we have more or less constantly tried

to identify new ways of reducing energy consumption and the environmental footprint of our compressors. Identifying new usage areas for our compressors, such as ALS, is part of our commitment to making shipping greener. Landing such a significant contract with Hyundai Heavy Industries is a fantastic seal of approval for our new range of ALS compressors," said Hans Petter Tanum, TMC's director of sales and business development.

The seven 174,000 cu m LNGCs will be equipped with Hyundai Heavy Industries' self-developed Hi-ALS ALS. According to Hyundai, its Hi-ALS system can cut fuel consumption by up to 8%.

They are due to be delivered

this year and next.

"Given the significant operational cost savings that ALS offer shipowners, we expect this technology to become mainstream in the coming decade. To play a part in this trend through our marine compressor technology is certainly one of our key objectives going forward," Tanum added.

TMC offers ALS application compressors that range

from 50 kW to 400 kW capacity, plus the associated ALS control system. ■



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Solar Solve kits out Arc7

Teekay's Arc7 LNGC 'Vladimir Voronin's' cabin windows have been fitted with Solar Solve Marine's STOPLITE roller blinds.

Some 47 of the type approved blinds were dispatched from Solar Solve's manufacturing facility in South Shields, UK, for onward transit to the LNGC that is trading in the Northern Sea routes and the Arctic without the help of ice-breakers.

They are to be installed at the bedroom windows of the ship's crew to help them to sleep during Polar daylight, which can last for 24 hours each day.

STOPLITE, one of Solar Solve Marine's ROLASOLV products, is a blackout roller blind inside a protective aluminium cassette with double side channels and light-barrier brush strips, significantly reducing sunlight to create ideal

day-time sleeping conditions. It is supplied with a flame retardant blackout fabric from a choice of colours.

John Lightfoot MBE, Solar Solve Marine's Chairman, commented, "We have a very good relationship with Teekay that has been built up over many years. Our team at Solar Solve worked with Teekay's technical team for two months to ensure they would get the right products to solve their problem, including supplying prototype

blinds that they could test for effectiveness, in situ.

"We are confident that the owners will receive favourable feedback from 'Vladimir Voronin's' crew members," he said.

Named after a Soviet sea cap-

tain, the 172,000 cu m LNGC was the fourth of six to be delivered into Teekay's fleet. Her delivery took place on 13th August last year in international waters off the coast of Russia under the guidance of transportation officials. ■



An Arc7 has been fitted with Solar Solve's cabin blinds

NEWS NUDGE

Dominion Cove goes to US DoE

The US Department of Energy (DoE) has received an application from Dominion Energy Cove Point LNG for authorisation to export domestically produced LNG.

Comments must be received by 24th February, the DoE said.

BV classes NYK newbuilding

One of the latest projects Paris-based classification society Bureau Veritas (BV) is undertaking is the classing of NYK's 174,000 cu m dual-fuel newbuilding at Samsung.

BV has been involved in LNGC design since the 1960s with the 'Jules Verne' among others.

The class society was also a founder member of the Energy Transition Coalition with the French Government, which was unveiled in December last year.

At a recent presentation in

KN to operate Açú terminal

AB Klaipėdos nafta (KN), KN Açú Serviços de Terminal de GNL and UTE GNA I Geração de Energia (GNA) have signed an operation and maintenance services agreement for GNA's LNG terminal at Açú in Rio de Janeiro State.

KN has been appointed operator of the LNG Terminal, which will provide operations, including maintenance of the jetty and its installations, gas pipeline and gas metering stations, as well as supporting the commissioning of the LNG Terminal.

This agreement will become effective once GNA receives remaining corporate and lenders approvals. The initial term of the agreement is 13 years operational period following the completion of the terminal and can be extended

by mutual agreement.

The terminal is due to start operations this year.

Through its subsidiaries, KN has established a special purpose company the Brazilian SPV, which will eventually be responsible for the services.

GNA - a joint venture formed by Prumo Logística, BP and Siemens - will develop, implement and operate sustainable energy and gas projects.

The LNG-to-power project, developed by GNA at Açú, is the

largest of this kind in South America. Currently, the project includes the development of two natural gas-fired thermoelectric plants (GNA I and GNA II) with a combined capacity of 3 GW plus the LNG terminal with a regasification capacity of 21 mill cu m per day.

The newly built FSRU 'BW Magna' of 170,000 cu m storage capacity will be delivered and operated by BW, while the LNG will be supplied by BP, a shareholder in GNA. ■

London, Matthieu de Tugny, BV's Marine and Offshore President said that the LNGC fleet will grow significantly in the next few years.

Quoting Clarksons, he said that 40 are due to be delivered this year, 56 in 2021 and 32 in 2022 to add to the 550 already in service of over 40,000 cu m capacity. ■

LNG rate assessments

Spot market (155,000-165,000 cu m)

Region	This week	Change*
East of Suez	\$65,000	-\$9,000
West of Suez	\$65,000	-\$14,000
12 mos T/C	\$71,500	-\$2,500

*Since last report 23/01/20

Source: Fearnleys (05/02/20)

WinGD advances clean fuel research

LNGC engine manufacturer WinGD (Winterthur Gas & Diesel) has developed a flexible injection system.

In a white paper, 'Flexible Injector to Advance Alternative Fuels Research', the engine designer describes how the concept will play a crucial role in its investigations into low-carbon liquid fuels and engine injection concepts to harness them.

The system was developed as part of HERCULES 2, the collaborative European engine research project which concluded in 2018. It features an adjustable needle to allow for the injection of lower density liquid fuels, including promising alcohol fuels like methanol and ethanol, as well as conventional fuels including heavy fuel oil and marine diesel oil.

At present there is great un-

certainty around the fuels that shipping will use to reduce its greenhouse gas emissions. Several of the candidates are unconventional liquid fuels including alcohols and synthetic diesel produced from biomass or renewable electricity. These will require different injection strategies to LNG, for example, which is already used in WinGD's X-DF engines.

WinGD Future Technologies Team Leader, Andreas Schmid, said: "The injection system is the most challenging element of designing an engine for low-carbon fuels, so this experimental design will give us an important head start. Once we know what fuels are likely to be used, we will be

able to use this concept as a starting point to develop more tailored injection concepts."

WinGD installed the fuel flexible injector on its RTX-6 engines in order to test ethanol combustion. Among other findings - detailed in the white paper - the company confirmed that ethanol fuel (with a small amount of diesel injected as a pilot fuel) reduces the formation of NOx and smoke emissions.

WinGD is currently involved in several projects investigating new liquid fuels, including the FALCON project to develop a carbon-neutral alternative to HFO from lignin, a component of sap found in trees and plants. The fuel-flexi-

ble injection system will now become part of the company's toolbox for validating low-carbon alternatives to help shipping meet its greenhouse gas reduction objectives.

These projects represent an ongoing valuable collaboration and exchange of ideas and equipment with Dr Konstantinos Boulouchos, and ETH Zurich's Aerothermochemistry and Combustion Systems Laboratory.

This project was made possible through funding from the Swiss Federal Office of Energy, bringing together academia and industry towards ensuring the transfer of knowledge and technology, WinGD explained. ■

Teekay Tankers sells STS and gas terminal interests

Teekay Tankers has announced the sale of its non-US ship-to-ship (STS) transfer business.

The company said it had reached an agreement with Hili Ventures to sell part of its oil and gas STS transfer support services business, which also provides gas terminal

management and gas consulting services, for about \$26 mill.

This sale is expected to close late in the first quarter or early in the second quarter of 2020.

Teekay Tankers will retain its full-service lightering business operating in the US Gulf, which provides STS oil transfers for both US crude imports and exports.

In addition, the company will continue to operate oil STS transfer support services in North America and the Caribbean, which has synergies with its core lightering business. ■

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WORLD LNG CARRIER ORDERBOOK

Name	Containment system	Yard	Propulsion	Capacity	Delivery date	Primary Owner
Marvel Pelican	Moss	Kawasaki	TFDE	155,000	15/12/2019	MOL
BW Magnolia	GT NO 96	DSME	MEGI	173,400	15/12/2019	BWGas
HHI / Total	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/01/2020	Cardiff Marine
HHI / Cardiff #1	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/02/2020	Cardiff Marine
HHI / Total / Sovc	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	28/02/2020	Sovcomflot
LNG Merak	GT NO 96	Hudong-Zhonghua	MEGI	174,000	01/03/2020	MOL
Elisa Larus	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	30/03/2020	NYK
Maran Gas Psara	GT NO 96	DSME	MEGI	173,400	01/04/2020	Maran Gas Maritime
Gaslog Windsor	GTT Mark III Flex	Samsung	XDF	180,000	15/04/2020	GasLog
HHI / Cardiff #2	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/04/2020	Cardiff Marine
SHI Gaslog #1	GTT Mark III Flex	Samsung	XDF	180,000	15/04/2020	GasLog
Samsung 2271	GTT Mark III Flex	Samsung	XDF	174,000	15/04/2020	Cardiff Marine
Daewoo 2478	GT NO 96	DSME	MEGI	173,400	15/05/2020	Nakilat
Flex Aurora	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/05/2020	Flex LNG
Bw Pavilion Aramhera	GT NO 96	DSME	MEGI	173,400	01/06/2020	BWGas
Traiano Knutsen	GTT Mark III Flex	Hyundai Heavy	MEGI	180,000	01/06/2020	Knutsen
Flex Reliance	GT NO 96	DSME	MEGI	173,400	01/07/2020	Flex LNG
Flex Amber	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	01/07/2020	Flex LNG
MOL HUDONG-ZHONGHUA 3/4	GT NO 96	Hudong-Zhonghua	MEGI	174,000	15/07/2020	MOL
SHI Gaslog #2	GTT Mark III Flex	Samsung	XDF	180,000	15/07/2020	GasLog
SHI #1	GTT Mark III Flex	Samsung	XDF	174,000	15/07/2020	Cardiff Marine
Flex Resolute	GT NO 96	DSME	MEGI	173,400	01/08/2020	Flex LNG
Energy Pacific	GT NO 96	DSME	MEGI	173,400	01/08/2020	Alpha Gas
HHI Sovcom #1	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	30/08/2020	Sovcomflot
Cool Discoverer	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	01/09/2020	Thenamaris
HHI 3037	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/09/2020	Cardiff Marine
HHI NYK DG #1	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/09/2020	NYK
MOL HUDONG-ZHONGHUA 4/4	GT NO 96	Hudong-Zhonghua	MEGI	174,000	01/10/2020	MOL
Samsung 2300	GTT Mark III Flex	Samsung	XDF	174,000	01/10/2020	GasLog
Maran Gas DSME	GT NO 96	DSME	MEGI	173,400	15/10/2020	Maran Gas Maritime
Flex Freedom	GT NO 96	DSME	MEGI	173,400	15/10/2020	Flex LNG
Aristos I	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/10/2020	Capital Gas
Celcius #1	GTT Mark III Flex	Samsung	XDF	180,000	15/10/2020	Celcius Shipping
SHI #17	GTT Mark III Flex	Samsung	XDF	174,000	15/10/2020	Cardiff Marine
Aristidis I	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	01/11/2020	Capital Gas
Flex Volunteer	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/11/2020	Flex LNG
HHI 3038	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/11/2020	Cardiff Marine
DSME 2484	GT NO 96	DSME	MEGI	173,400	01/12/2020	Alpha Gas
Samsung 2301	GTT Mark III Flex	Samsung	XDF	174,000	01/12/2020	GasLog
Celcius #2	GTT Mark III Flex	Samsung	XDF	180,000	15/12/2020	Celcius Shipping

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
Data last updated = 12th December 2019

Name	Containment system	Yard	Propulsion	Capacity	Delivery date	Primary Owner
DSME Dec #1	GT NO 96	DSME	MEGI	180,000	15/12/2020	MOL
HHI Sovcom #2	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/12/2020	Sovcomflot
Global Star	GT NO 96	DSME	MEGI	173,400	01/01/2021	Nakilat
DSME Minerva #1	GT NO 96	DSME	MEGI	173,400	15/01/2021	Minerva Marine
Cool Racer	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/01/2021	Thenamaris
SHI Minerva #1	GTT Mark III Flex	Samsung	XDF	174,000	15/01/2021	Minerva Marine
HHI 3112	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/01/2021	Cardiff Marine
Samsung 2313	GTT Mark III Flex	Samsung	XDF	180,000	01/02/2021	Celcius Shipping
DSME Minerva #2	GT NO 96	DSME	MEGI	173,400	15/02/2021	Minerva Marine
HHI Latsco #1	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/02/2021	Latsco Shipping
DSME 2496	GT NO 96	DSME	MEGI	174,000	15/02/2021	BWGas
DSME Dec #2	GT NO 96	DSME	MEGI	180,000	15/02/2021	MOL
Marvel Swan	GTT Mark III Flex	Samsung	XDF	173,400	01/03/2021	Navigare
Aristarchos	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/03/2021	Capital Gas
Flex Vigilant	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/03/2021	Flex LNG
HHI 3039	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/03/2021	Cardiff Marine
SHI #18	GTT Mark III Flex	Samsung	XDF	174,000	15/03/2021	Cardiff Marine
DSME 2485	GT NO 96	DSME	MEGI	173,400	15/04/2021	Alpha Gas
SHI NYK	GTT Mark III Flex	Samsung	XDF	174,000	15/04/2021	NYK
Celcius #4	GTT Mark III Flex	Samsung	XDF	180,000	15/04/2021	Celcius Shipping
DSME 2495	GT NO 96	DSME	XDF	174,000	15/05/2021	Maran Gas Maritime
HHI NYK DG #2	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/05/2021	NYK
Attalos	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/06/2021	Capital Gas
DSME 2497	GT NO 96	DSME	MEGI	174,000	15/06/2021	BWGas
HHI NYK DG #3	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/06/2021	NYK
SHI Gaslog CE #1	GTT Mark III Flex	Samsung	XDF	180,000	15/06/2021	GasLog
Alpha Gas	GT NO 96	DSME	MEGI	174,000	15/06/2021	Alpha Gas
CSSC #1	GT NO 96	Hudong-Zhonghua	XDF	174,000	15/06/2021	CSSC
Capital Gas #5	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/07/2021	Capital Gas
DSME MOL #3	GT NO 96	DSME	MEGI	173,400	15/07/2021	MOL
HHI Latsco #2	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/08/2021	Latsco Shipping
SHI Gaslog CE #2	GTT Mark III Flex	Samsung	XDF	180,000	15/08/2021	GasLog
DSME Maran	GTT Mark III Flex	DSME	MEGI	174,000	15/08/2021	Maran Gas Maritime
DSME Maran #2	GTT Mark III Flex	DSME	XDF	173,400	15/08/2021	Nakilat
Samsung 2305	GTT Mark III Flex	Samsung	XDF	174,000	01/09/2021	Minerva Marine
SHI 2306	GTT Mark III Flex	Samsung	XDF	174,000	15/09/2021	NYK
Capital Gas #6	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/09/2021	Capital Gas
HHI SK E&S	GTT Mark III Flex	Hyundai Heavy	XDF	180,000	15/09/2021	SK Shipping
DSME Maran #3	GTT Mark III Flex	DSME	XDF	173,400	15/10/2021	Nakilat
Samsung #11	GTT Mark III Flex	Samsung	XDF	174,000	15/10/2021	NYK
SHI 2307	GTT Mark III Flex	Samsung	XDF	174,000	15/11/2021	NYK

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
Data last updated = Data last updated = 12th December 2019

Name	Containment system	Yard	Propulsion	Capacity	Delivery date	Primary Owner
HHI TEN	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/11/2021	Tsakos Energy Navigation
DSME Maran 2504	GT NO 96	DSME	XDF	174,000	15/12/2021	Maran Gas Maritime
HHI Capital Gas #7	GTT Mark III Flex	Hyundai Heavy	XDF	174,000	15/12/2021	Capital Gas
DSME 2507	GT NO 96	DSME	XDF	174,000	15/12/2021	Maran Gas Maritime
HSHI	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/12/2021	Hanjin Shipping
CSSC #2	GT NO 96	Hudong-Zhonghua	XDF	174,000	15/01/2022	CSSC
HHI Samho Edison	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/01/2022	NYK
Samsung N/A	GTT Mark III Flex	Samsung	XDF	174,000	15/01/2022	Minerva Marine
Samsung 2019 #9	GTT Mark III Flex	Samsung	XDF	174,000	15/01/2022	JP Morgan
SHI Mar19	GTT Mark III Flex	Samsung	XDF	174,000	15/03/2022	Nisshin Shipping
H Samho NYK	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/03/2022	NYK
Hyundai European #1	GTT Mark III Flex	Hyundai Heavy	XDF	180,000	15/03/2022	Dynagas
Maran gas dec19	GT NO 96	DSME	XDF	174,000	15/03/2022	Maran Gas Maritime
H-Line #2	GTT Mark III Flex	Hyundai Samho	XDF	174,000	15/04/2022	Hanjin Shipping
DSME May19	GT NO 96	DSME	MEGI	174,000	15/05/2022	Maran Gas Maritime
Hyundai European #2	GTT Mark III Flex	Hyundai Heavy	XDF	180,000	15/06/2022	Dynagas
BW oct 2019 #1	GT NO 96	DSME	MEGI	174,000	15/06/2022	BWGas
Samsung 2019 #10	GTT Mark III Flex	Samsung	XDF	174,000	15/07/2022	JP Morgan
BW oct 2019 #2	GT NO 96	DSME	MEGI	174,000	15/09/2022	BWGas
Samsung 2364	GTT Mark III Flex	Samsung	XDF	174,000	01/01/2023	MISC
Samsung 2365	GTT Mark III Flex	Samsung	XDF	174,000	01/02/2023	MISC

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
Data last updated = Data last updated = 12th December 2019



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WORLD SMALL SCALE LNG FLEET*

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
1974	Seagas	187	LNG	Sweden	Yes	AGA
1988	Kayoh Maru	1,517	LNG	Japan	Yes	Daiichi
1993	Aman Bintulu	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1996	Surya Aki	19,475	LNG	Indonesia - Japan	Yes	MCGC
1997	Aman Sendai	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1998	Pelita Energy	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	Triputra	23,096	LNG	Indonesia - Japan	Yes	MCGC
2003	Pioneer Knutsen	1,100	LNG	Norway	Yes	Knutsen
2003	Shinju Maru No.1	2,540	LNG	Japan	Yes	Shinwa
2005	North Pioneer	2,500	LNG	Japan	Yes	Japan Liquid Gas
2007	Sun Arrows	19,531	LNG	Malaysia-Russia-Japan	Yes	Mitsui
2008	Kakurei Maru	2,536	LNG	Japan	Yes	Hogaki Zosen
2008	Shinju Maru No.2	2,540	LNG	Japan	Yes	Shinwa
2009	Coral Methane	7,551	LNG/LPG/Ethylene	Northwest Europe/Baltics	Yes, sometimes	Anthony Veder
2010	Coral Favia	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2010	Coral Fraseri	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
2011	Coral Furcata	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Coral Fungia	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Vision Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2011	Unikum Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2012	Coral Energy	15,600	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2013	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	JS Ineos Ingenuity	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos Evergas	
2015	JS Ineos Insight	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos Evergas	
2015	JS Ineos Intrepid	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos Evergas	
2015	PetroChina TBN	30,000	LNG	China		PetroChina
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	LNG Prime	2,250	LNG	Northwest Europe	Yes	Veka Deen LNG
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos Evergas	
2016	JS Ineos Innvation	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos Evergas	
2016	JS Ineos Inspiration	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos Evergas	
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2017	Oizmendi	600	LNG	Bilbao	Yes	Itsas Gas
2017	ENGIE Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	Coralius	5,800	LNG	Northwest Europe/Baltics	Yes, for Skangas	Anthony Veder
2017	Cardissa	6,500	LNG	Northwest Europe	Yes	Shell

For more information please visit <http://small-lng.com>

*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less

TBN = To Be Nominated indicates ships are still at construction/planning stage

** = project shelved † = Data to be verified Data last updated = 27th November 2019

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	Coral EnergiICE	18,000	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2017	JS Ineos Invention	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	JS Ineos Intuition	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	Coral Encanto	30,000	LNG	China	Yes	Anthony Veder
2018	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang
2018	LNG London	3,000	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 2	6,500	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 3	6,500	LNG	Northwest Europe	Yes	Shell
2018	Kairos	7,500	LNG	Baltic	Yes	Bernhard Schulte
2018	Qi Yuan	28,000	LNG	China	Yes	Dalian Inteh Group
2018	Bunker Breeze	0	LNG	Barcelona	Yes	Suardiaz Energy Shipping
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2019	Gas Agility	18,600	LNG	NWE	Yes	MOL
2019	Flexfueller 001	1,480	LNG	Amsterdam	Yes	Titan LNG
2020	Q-LNG 4000	4,000	LNG	US Coast	Yes	Q-LNG Transport/Harvey Gulf
2020	Stolt TBN (option) **	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	FuelLNG TBN	7,500	LNG	Singapore	Yes	FuelLNG
2020	CLS TBN	3,500	LNG	Japan	Yes	CLS
2020	Elenger TBN	6,000	LNG	NWE	Yes	Elenger
2020	ENN TBN	8,500	LNG	China	Yes	ENN
2020	Flexfueller 002	1,480	LNG	Antwerp	Yes	Titan LNG
2021	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2021	Knutsen TBN	30,000	LNG	Mediterranean	Yes	Knutsen OAS
2021	Gazprom Neft TBN	5,800	LNG	Russia	Yes	Gazprom Neft
2021	PE TBN	12,000	LNG	Singapore	Yes	MOL
2021	JMU TBN	2,500	LNG	Japan	Yes	JMU
2022	Stolt TBN	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2022	Stolt TBN	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2022	PNE TBN	5,400	LNG	USG	Yes	PNE
2024	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2024	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2026	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2026	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas

For more information please visit <http://small-lng.com>

*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less

TBN = To Be Nominated indicates ships are still at construction/planning stage

** = project shelved † = Data to be verified Data last updated = 27th November 2019