

LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS

18 April 2019

Act to remove restrictions on US LNG exports reintroduced

Three US Senators and a Representative have reintroduced an act in an attempt to remove perceived barriers placed on US natural gas exporters.

The License Natural Gas (LNG) Now Act, backed by US Senators Bill Cassidy, MD (R-LA), John Kennedy (R-LA), and Shelley Moore Capito (R-WV), and US Representative Clay Higgins (R-LA), is aimed at revamping the current system put in place by the US Department of Energy (DOE) decades ago and to continue market growth of US LNG exports without any delays, they said in a joint statement.

"Decades-old restrictions on importation and exportation have stalled LNG projects that would benefit Louisiana workers, the economy, and the environment," said Dr Cassidy. "This legislation brings good-paying jobs to Louisiana while lowering global greenhouse gas emissions by replacing high emitting energy sources in foreign nations with cleaner burning American natural gas."

"The best thing we can do to create jobs in Louisiana is to encourage investment in the LNG market," said Senator Kennedy. "By removing job-killing restrictions, we can help Louisiana meet the worldwide demand for cleaner sources of energy. That will ignite investment and grow jobs."

"I'm always working to grow West Virginia's energy industry," said Senator Capito. "This legislation would expand international markets for natural gas produced in West Virginia while supporting American foreign policy and reducing our allies' dependence on hostile sources of energy, like Russia and Iran."

"America is leading the way in clean, innovative LNG technologies that are changing the global energy landscape. Southwest Louisiana is at the center of these efforts," said Representative Higgins. "The LNG Now Act streamlines the approval process for export permits and eliminates barriers that slow project development. This means greater access to international markets and more jobs and economic growth for our communities."

Meeting demand

Under the act, the US would have the opportunity to meet the anticipated 4% - 5% of the annual LNG global demand growth. The administration would also retain the ability to limit natural gas importation and exportation levels during emergencies, disasters or exchanges with particular foreign nations.

The proposed act includes:

- Removes decades old restrictions on the exportation and importation of natural gas that have stalled development of previous projects.
- Guarantees acceptance of export volume applications to the DOE for export and import of natural gas without delay.
- Retains the DOE's management and record keeping responsibilities.
- Has the potential to lower global CO2 emissions by foreign nations replacing high emitting energy sources with natural gas.
- Retains the administration's



Senator Bill Cassidy is one of the drivers for change in the US Government's LNG export process

ability to limit export or import of natural gas during national emergencies or disasters.

- Retains the administration's ability to restrict import or export of natural gas to nations unfriendly to the US.
- Requires the US Secretary of Energy to submit a report to Congress on what actions could be taken by the Government to foster increased exportation of natural gas.
- Requires the Secretary of Energy to submit a report to Congress that identifies current regulations that inhibit the growth of the US natural gas market.
- Keeps the Federal Energy Regulatory Commission (FERC) LNG export facility process intact.

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Eagle LNG's Jacksonville project takes a step forward

Eagle LNG Partners received the Final Environmental Impact Statement (FEIS) from the US Federal Energy Regulatory Commission (FERC) on 12th April.

This is another milestone towards the construction of the Jacksonville LNG export facility, the company said, being the final step in the environmental review process before the Federal authorisation decision deadline and the project's anticipated FERC approval.

"Achieving this critical milestone is a significant step forward for Eagle's Jacksonville LNG ex-

port facility, as we continue to advance our efforts to supply clean burning, domestic and affordable LNG for marine bunkering and small-scale LNG export to both domestic and international markets," said Sean Lalani, Eagle LNG President. "We appreciate the continued support we have received from regulators, the Jacksonville and North Florida communities, and local agencies."



Eagle LNG's Jacksonville export facility is aimed at serving the Caribbean

The FEIS is a result of FERC's process that Eagle LNG started in December, 2014, and includes the completion of numerous environmental, safety and security reviews involving input from both federal and state agencies and various stakeholders.

The proposed Jacksonville LNG facility will initially consist of three liquefaction trains, which, at full build-out, will be capable of producing up to around 1 mill tonnes of LNG per annum.

"The Jacksonville LNG export facility, with its prime Florida East Coast location, will give us a unique and competitive advantage in helping provide some of the lowest-cost power generation for nearby Caribbean countries. With approximately \$500 mill of infrastructure investment, this project will continue to generate numerous well-paying direct and indirect jobs in Florida," Lalani added. ■

NEWS NUDGE

Construction starts at Louisiana Calcasieu LNG plant

Venture Global LNG has started to construct the Louisiana Calcasieu LNG plant after receiving authorisation, a senior company executive told Reuters early this month.

The Calcasieu Pass facility is designed to produce about 10 mill tonnes per annum of LNG, or about 1.3 bill cu ft per day of natural gas, said Michael Sabel, co-chief executive and co-chairman of Venture Global.

"We received our final (US) FERC authorisation and DOE export authorisation," he said at the LNG2019 conference in Shanghai. ■

Keppel receives first US LNG cargo

Keppel Gas Pte Ltd (Keppel Gas), a wholly-owned subsidiary of Keppel Infrastructure Holdings Pte Ltd (Keppel Infrastructure), has received its first LNG cargo import under Singapore's Spot Import Policy.

This policy allows up to 10% of Singapore's total long term contracted gas supplies to be imported on a spot cargo basis.

A cargo of 160,000 cu m of LNG, originating from an LNG liquefaction project in North America shipped by an unnamed LNGC, marked the first time that Keppel Gas has received gas from beyond Southeast Asia.

The LNG cargo reached Singapore on 10th April, 2019 and will

be regasified as feedstock for downstream customers and end users, including Keppel Merlimau Cogen, over a period of 30 days.

Such recurring spot LNG import opportunities help to bolster Keppel Gas' gas supply portfolio, complementing its long-term pipeline gas import business, the company said.

Ms Janice Bong, General Manager (Energy Infrastructure), Keppel Infrastructure, said, "We are

pleased to have deepened our collaboration with industry partners across the gas value chain to deliver competitive gas supplies promptly. By tapping the opportunities offered by the spot LNG market, we are able to ride on global trends to support our integrated energy business over the long term."

Keppel Gas is an importer, shipper and retailer of natural gas in Singapore's liberalised

gas market.

Its imported natural gas supply portfolio comprises long-term piped natural gas and LNG contracts, and is supplemented from time to time with a spot cargo.

The imported natural gas is supplied to a portfolio of major refineries, petrochemical companies, industrial companies and Keppel Merlimau Cogen, a 1,300 MW combined cycle gas turbine generation facility. ■

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2 Prospect Road
St Albans AL1 2AX
United Kingdom
www.lngjournal.com
Tel: +44 (0)20 7253 2700

Publisher
Stuart Fryer

Editor

Ian Cochran
+44 (0) 7748144265
cochran@tankeroperator.com

Ad sales enquiries

Narges Jodeyri
+44 (0)20 7017 3406
narges@lngjournal.com

Subscriptions

Gabi Weck
Tel: +44 (0) 20 7253 2700
gabi@lngjournal.com

Production

Vivian Chee
Tel: +44 (0) 20 8995 5540
chee@btconnect.com

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LNGC newbuilding news

There were several more LNGC contracts reported recently.

For example, John Angelicoussis' Maran Gas Maritime has ordered a fourth LNGC at Daewoo Shipbuilding & Marine Engineering (DSME).

The shipbuilding contract was signed on 9th April.

DSME will build the 174,000 cu m LNGC at its Geoje Okpo Shipyard and deliver her by the first quarter of 2022.

So far this year, DSME said that it had secured a total of \$1.3 billion worth of orders, including four LNGCs, all of which were contracted by Maran Gas Maritime.

DSME also said that it was in discussions for additional LNGC orders, adding that it expected more contracts to be signed in the future.

Another order was placed by NYK for a 174,000 cu m LNGC at Hyundai Samho on the back of a 20-year charter to Italian energy company Edison.

She will be fitted with an X-DF fuel-efficient, dual-fuel engine and is scheduled to be completed in 2022.

The LNGC will have a length of 297 m and a width of 46.4 m.

The charter deal includes an extension option.

Sovcomflot was thought to have ordered an LNGC at Zvezda Shipbuilding.

The ship is scheduled for delivery in 2022, according to Asiasis data.

Sovcomflot and Zvezda signed the agreement to build the gas carrier on 5th April, 2019, local media reported.

Subsequently, Sovcomflot and Russian gas producer Novatek signed a 25-year charter deal for the newbuilding.

The new Arc7 LNG will be built to serve the Arctic LNG 2 project.

Arctic LNG 2 gas will be shipped by a fleet of Ice Class LNGCs that will be able to use the Northern Sea Route and a transshipment terminal in Kamchatka for cargoes destined for Asia and another near Murmansk for cargoes destined for Europe.

The final investment decision (FID) is expected this year, with plans to start up the first train by the end of 2023.

Elsewhere, Avenir LNG Ltd has

switched its optional order for two 7,500 cu m LNGCs from Keppel Singmarine to firm orders at Nantong CIMC Sinopacific Offshore & Engineering Co Ltd (SOE).

In addition, options were agreed to build two more at SOE.

Delivery of the two LNGC newbuildings is scheduled for May and August, 2021. The ships are designed for Ice Class 1B, full bunker functionality, double hull and dual fuel electric twin azimuth propulsion.

This order replaced the previous option to build two additional ships with Keppel Singmarine, which was cancelled by mutual agreement.

Avenir's orderbook remains unchanged with six vessels - four 7,500 cu m LNGC's and two 20,000 cu m LNGC's, currently under construction, the company explained.

Existing contracts are in place with SOE for two 20,000 cu m LNGCs. These are scheduled for delivery in 1Q21. The contracts also include options to build two, plus two additional 20,000 cu m vessels. ■

Jera to purchase gas from LNG Canada

Japanese utility concern, JERA has signed a Heads of Agreement (HOA) with Diamond Gas International Pte Ltd, a subsidiary of Mitsubishi Corp, for the sale and purchase of LNG from the LNG Canada Project.

The contract is for the purchase of up to 16 cargoes of LNG a year for about 15 years beginning in fiscal 2024. This first procurement of LNG from Canada diversifies JERA's supply portfolio and can be expected to contribute to stable and economical LNG procurement in the future, the company said.

The destination clause in this HOA is in line with the survey on LNG trades report released by the Japan Fair Trade Commission in June, 2017, and JERA said that it believed this will help it respond appropriately to LNG supply and demand uncertainty and expand opportunities for optimising its LNG portfolio. ■

PNG LNG signs SPA with Unipac

The PNG LNG project co-venturers have entered into a mid-term LNG sale and purchase agreement (SPA) with Unipac Singapore, a wholly-owned subsidiary of Sinopec, for the supply of LNG commencing this month.

According to Santos, the mid-term SP is for the supply of around 0.45 million tonnes of LNG per annum over a four-year period.

This SPA takes the total contracted volumes from the project to 7.9 million tonnes per annum, with 6.6 million tonnes of PNG LNG's annual output already committed under long-term contracts to JERA, Osaka Gas, Sinopec and CPC, and a further 1.3 million tonnes under mid-term SPAs with PetroChina, BP and Unipac.

Santos has a 13.5% interest in PNG LNG. ■

Simulation analysis for Saguenay River LNGC transits

The Canadian Maritime Simulation and Resource Centre (MSRC) has played a key role in the Énergie Saguenay project, spearheaded by GNL Québec.

This project involves the construction of a natural gas liquefaction complex at Port Saguenay to be installed on lands belonging to the Administration Portuaire de Saguenay (Saguenay Port Authority), adjacent to the existing Grande-Anse port facilities.

This includes liquefaction equipment, storage facilities, and marine shipping infrastructures, which is where the MSRC's simulator came into play. The purpose of the simulation analysis, which was carried out at the request of GNL Québec and Bechtel, is twofold: to examine the dock design and to assess the transit requirements of the Saguenay River. The study also

helped determine how planned vessel movements can be conducted with safe manoeuvring.

"Although such vessels have never previously transited the Saguenay," said Paul Racicot, MSRC Director, "pilots from the Corporation of Lower St. Lawrence Pilots (CLSLP) have many years of experience transiting large bulk carriers and cruise ships within the region and have a comprehensive understanding of the dynamic environmental phenomena and physical constraints which factor into the overall vessel manoeuvring equation."

"Simulation allows us to evaluate manoeuvres that will be car-

ried out in this channel, specifically at the mouth of the Saguenay," added Énergie Saguenay's Director of Environment, Caroline Hardy. "This is extremely beneficial. Understanding the capabilities and abilities of LNG vessels in various current, tide and meteorological conditions were a key take-away from these simulations and makes our jobs safer and easier."

"The working environment and state-of-the-art simulators combined with the pilots' expertise were conducive to getting all the answers we were looking for," said Chris Thomas, Senior Maritime Coastal Engineer at Bechtel. ■

Golar LNG Limited issues business update

Golar LNG Limited has received a firm \$700 mill underwritten financing commitment for the FLNG 'Gimi'.

FLNG 'Gimi' will serve the 20-year BP's Tortue contract, due to commence in 2022.

Available during construction, the financing has a tenor of seven years post COD and a 12-year amortisation profile.

Clifford Capital Pte Ltd, ING Bank NV, Natixis and ABN Amro Bank NV. acted as facility underwriters.

Concurrent with receipt of the financing commitment, First FLNG Holdings Pte Ltd (FFH), an indirect wholly owned subsidiary of Keppel Corp Limited held through Keppel Capital Holding, subscribed to 30% of the total issued ordinary share capital of Gimi MS.

Gimi MS also issued Keppel Shipyard with a Final Notice to

Proceed with the FLNG 'Gimi' conversion that had been initiated under a Limited Notice to Proceed in December, 2018.

In addition, the Croatian FSRU facility, LNG Hrvatska's project developers have also issued Golar with a Notice to Proceed with the conversion and subsequent purchase of the 2005-built LNGC 'Golar Viking'.

Under the agreement, conversion capex will largely be funded by stage payments from LNG Hrvatska. After a robust vetting process, Hudong has been selected as the yard to undertake the conversion works.

CSSC Leasing, a Hudong affiliate company, is expected to provide both conversion financing

and bridging finance for the current vessel facility between yard entry, expected in the first quarter of next year, and sale to LNG Hrvatska upon completion for €156.9 mill. Golar will also receive an annual fee to operate the FSRU for 10 years.

Golar has also received agreement from lenders of the FSRU 'Golar Tundra', subject to documentation, to extend the June, 2019 maturing facility to June, 2021. Documentation of the Gimi and Tundra facilities is now underway. Having agreed a term sheet, good progress has also been made with respect to refinancing the December, 2019 maturing LNGC 'Golar Arctic' facility.

CEO, Iain Ross, commented, "In



CEO Iain Ross

line with guidance provided in the last quarterly earnings announcement Golar continues to make progress in line with expectations. The Company looks forward to providing further details when it reports its 1Q19 results next month."

GTT suffers revenue fall

GTT (Gaztransport & Technigaz) reported a drop in consolidated revenue of 8.2% for the first quarter of this year.

The consolidated revenue was €58.9 mill, compared with €64.2 mill in 1Q18.

Revenue linked to new construction came to €55.4 mill, down by 10%. Royalties from LNGCs decreased by 15.3%, to total €46.2 mill, and FSRU royalties by 16.2% to €5.2 mill.



GTT's CEO Philippe Berterotière is bullish on the future despite revenue drop

GTT said that the 1Q19 revenue did not fully benefit from the flow of orders in 2018 (14 LNGCs under construction out of 48 ordered), whilst the figures for the same period in 2018 was essentially based on orders prior to 2016.

Other royalties increased, including royalties from FLNGs at €1.3 mill (+153.3%) and from LNG as fuel at €1.6 mill.

Revenue linked to services was €3.6 mill, strong growth (+34.7%) compared with 1Q18, notably due to the rise of maintenance services and, to a lesser extent, the contribution of Ascenz.

Philippe Berterotière, GTT Chairman and CEO, commented: "The level of new orders held firm in the first quarter of 2019, in line with the good steady performance of the LNG market. We have already booked 14 orders for LNG carriers.

"With regard to LNG as fuel, we are registering increasing interest from shipowners, which in

the first quarter led to an order for a bunker vessel and more recently an order for the conversion of a container vessel to LNG.

"In financial terms, revenue has not yet fully benefited from the flow of orders in 2018 and decreased in the first quarter of 2019 compared with the same period last year, which was based on older orders. Given the good level of our order book and schedule for vessel construction, we confirm our targets for the whole of the year," he concluded.

All time high

With 14 orders for LNG carriers booked in 1Q19, GTT's main business activity is at an all-time high, the company claimed. The LNGCs will all be equipped with recent GTT technologies - Mark III Flex+, Mark III Flex and NO96 GW.

They will be delivered between the end of 2020 and the end of 2021.

Since 1st January, 2019, the GTT's order book, excluding LNG

as fuel, which then comprised 97 units, has evolved as follows:

- Nine LNGC deliveries;
- One FSRU delivery;
- 14 LNGC orders.

As at 31st March, 2019, the order book, excluding LNG as fuel, stood at 101 units, of which:

- 88 LNGCs;
- Eight FSRUs;
- Two FLNGs;
- Three onshore storage tanks.

With regard to LNG as fuel, the number of vessels on order at 31st March, 2019 was 12 units, plus the order for the Hapag-Lloyd container vessel received in April.

In the absence of significant cancellations or delays to orders, GTT confirmed its targets for FY2019 as consolidated revenues of between €255 mill and €270 mill, 2019 consolidated EBITDA within a range of €150 mill to €160 mill, plus a dividend target, in respect of FY2019 and FY2020, corresponding to a payout rate of at least 80% of consolidated net income.

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EPIK to engineer Newcastle LNG terminal project

South Korean LNG project development company, EPIK has signed an agreement with Australian construction company Watpac to provide design, engineering and construction services for the Newcastle LNG FSRU import terminal in Australia.

An undisclosed target EPC price was included in the agreement with mechanisms to ensure project competitiveness. Further, it was announced that Newcastle GasDock Company Pty Ltd, a wholly-owned subsidiary of EPIK, has been established in Australia to carry out the project's FSRU on-shore infrastructure components.

Watpac will be supported by Mott MacDonald, a marine and engineering infrastructure consultant with experience in the design and engineering of multiple FSRU projects worldwide.

Jee Yoon, EPIK's Founder and Managing Director, said, "This is a significant step forward for the Newcastle LNG project. Partnering with Watpac and Mott MacDonald for the exclusive provision of de-

sign, engineering and EPC services for Newcastle LNG enables EPIK to secure uncompromising engineering expertise at a competitive price point, facilitating and preserving our aggressive project development schedule."

Watpac is a wholly-owned subsidiary of BESIX, which in September, 2018, completed the design and construction of the Bahrain LNG import terminal located off-shore Muharraq Island, which is anticipated to commence commercial operations in May of this year.

"As an Australian company, we are thrilled to be partnering with EPIK to deliver the engineering and construction services for this critical project," said Bram Gruwez, Watpac General Manager, Marine & Civil. "With our help, the



Newcastle, NSW could soon be home to a large LNG receiving terminal

Newcastle LNG import terminal will safely provide NSW with a long-term source of competitive gas supply, supporting existing and future industry and helping to grow the region's economy."

Watpac and Mott MacDonald join a growing line up of experienced industry professionals supporting the Newcastle LNG development. In February, 2019, it was announced that EPIK and Hyundai LNG Shipping had formed a strategic partnership to collabo-

rate on FSRU projects worldwide.

In addition, EPIK is engaged with advisors and consultants, including environmental and planning support from Arup, and legal and regulatory counsel from K&L Gates, among others.

EPIK said that it expected to place an order for a newbuilding FSRU subject to Newcastle Gasdock Co receiving all regulatory approvals for the project, which the company currently estimated to be by early 2020. ■

Burckhardt and Wärtsilä to provide equipment for LNGC newbuilding

Burckhardt Compression is to fit its patented Laby compressors on 30,000 cu m LNGC newbuilding to be operated by Knutsen OAS Shipping.

The compressors will be delivered to Hyundai Mipo Dockyard as part of the fuel gas supply system built by Wärtsilä Oil & Gas Solutions and will supply the LNGC's WinGD X-DF 2-stroke, dual-fuel engine with LNG boil-off gas as fuel.

The X-DF engine, a 2-stroke engine from Winterthur Gas & Diesel, allows both natural gas and marine diesel to be used as fuel for ship propulsion systems.

Ships can switch between the two fuel types, maritime diesel and the boil-off gas that evaporates from the LNG containment tanks, during operations.

In addition, Wärtsilä will provide its integrated propulsion and cargo handling solution for the newbuilding. The Wärtsilä systems

will ensure effective interfacing between the vessel's propulsion, on board auxiliary power generation, and cargo control processes. The order was booked in January, 2019, and the contract includes an option for an additional sister vessel.

Wärtsilä's cargo handling system includes the fuel supply, cargo control system, boil-off gas (BOG) reliquefaction, and safety management. The 5-cylinder WinGD X52DF dual-fuel main engine and the Wärtsilä auxiliary dual-fuel engines are essential consumers for the BOG management system, which monitors and controls the cryogenic cargo, to ensure, in combination with a Wärtsilä developed mixed refrigerant re-liquefaction unit, all time

NEWS NUDGE

Zeebrugge to offer LNG discharge and storage subscription window

Fluxys is to launch a subscription window for unloading slots and additional storage services at its Zeebrugge LNG terminal during the second half of this month.

This was claimed to be a highly attractive opportunity for the securing of LNG terminalling capacity with an experienced capacity provider at a key strategic location providing optimum destination flexibility, the company said.

Capacity at the Zeebrugge LNG terminal is highly attractive because gas import needs in

Northwest Europe are set to rise significantly, Fluxys explained.

While gas production in The Netherlands and the North Sea is declining, gas demand for power generation will increase to accommodate the phase-out of sizeable coal, lignite and nuclear power generation capacity in the region.

FERC prepares Corpus Christi LNG project EA

The US Federal Energy Regulatory Commission (FERC) has issued a notice stating that the environmental assessment (EA) for the proposed Stage 3 Project at Corpus Christi LNG project has been prepared.

Comments must be received by 29th April. ■

control over the cargo tank pressure and temperature.

The vessel will also be one of the first LNGCs in its size to be equipped with space-saving C-type bi-lobe cargo tanks.

Wärtsilä's equipment is scheduled for delivery in 2020, and the

vessel is expected to be delivered during the first half of 2021.

Under a 12-year long term charter, she will be operated by Knutsen and will be chartered to Italian energy company Edison to be used to supply Italian coastal LNG terminals. ■

ABS grants AIPs to two more Chinese designs

ABS has granted Approval in Principle (AIP) to two new gas carrier designs from Hudong-Zhonghua Shipbuilding.

The two new vessel designs are for a 200,000 cu m LNGC and a 147,000 cu m Very Large Ethane Carrier (VLEC).

“ABS is proud to support the pioneering work of Hudong-Zhonghua in the design and delivery of gas carriers. By awarding these AIPs, ABS is demonstrating its commitment to promoting innovative concepts which meet market needs and drive safer and more sustainable shipping,” said Eric Kleess, ABS Senior Vice President, Eastern Hemisphere Operations. “In reviewing novel gas carrier designs, ABS is able to draw on our extensive experience in the classification of VLECs in

supporting the safer handling, storage and transport of gas.”

The LNGC is designed for long-distance, large-scale LNG transportation, featuring enhanced cargo capacity and greater efficiency compared to conventional ships. The VLEC is a tailored design for US/China routes, which can meet US Coast Guard requirements and is equipped with a dual-fuel propulsion system using ethane as the main fuel, which can meet emission requirements.

“Hudong-Zhonghua, with the support of ABS, has a proud record of innovation in the design and construction of gas carriers in China,” said Jin Yanzi, Hudong-Zhonghua

Shipbuilding’s Vice President. “With the granting of these AIPs by ABS,

these latest designs are now set to continue that tradition.” ■



ABS has awarded AIPs to Hudong-Zhonghua designs

Wärtsilä and SHI to co-operate on LNGC design

Wärtsilä and Samsung Heavy Industries (SHI) have signed a joint development project (JDP) agreement aimed at establishing a more efficient solution for LNGCs and shuttle tankers.

This agreement was signed on 3 April at the LNG19 exhibition in Shanghai.

The JDP will build on the sharing of knowledge and experience between SHI and Wärtsilä. It is expected that the agreement, which provides a level of equality that is greater than in normal shipyard/supplier relationships, will benefit both parties and the industry as a whole, since it gives valuable opportunities for impor-

tant co-creation.

“At Wärtsilä we are committed to creating greater efficiencies, better environmental sustainability, and improved safety for our customers. The joint development with SHI will support this commitment. SHI is a major high-tech, high-value shipbuilder with a number one newbuilding share in various vessel markets. We are, therefore, delighted to be partnering with them in a project that

will ultimately benefit owners and operators around the world,” said Timo Koponen, Vice President, Processing Solutions, Wärtsilä Marine.

“We look forward to working with Wärtsilä to co-develop LNGCs and Shuttle Tankers with improved efficiency. We are both market leaders in our spheres, and this joint development underscores the mutual respect and appreciation that we have for each other’s

knowledge and experience,” said Jin-Taek Jung, Executive Vice President, Engineering & Procurement Operations, SHI.

An important driver for the JDP is the strong LNGC newbuilding market. There are potentially dozens of new vessels to be ordered for transporting increasing volumes of LNG from both new and extended export LNG terminals in Africa, Australia, Middle East and US. ■

RS and GTT sign co-operation agreement

Russian Maritime Register of Shipping (RS) and GTT have signed a co-operation agreement for LNG transportation.

A two-year working programme makes provisions for both parties’ interaction in the development of the requirements and additions to the RS rules, as well as the approval of materials, products, technologies and GTT designed LNG containment systems.

RS surveyors will take a special comprehensive training course covering the structural design, construction, and maintenance of GTT systems.

Joint competencies of the RS as an expert in the classification of ships operating in ice conditions and GTT as the frontrunner in the development of membrane systems for gas carriers and floating facilities, will allow the register to offer customers a full range of services on approval of membrane containment systems in accordance with the requirements of the International Code for the Construction and Equip-

ment of Ships Carrying Liquefied Gases in Bulk (IGC Code) and the RS rules.

The new agreement adds to the on-going collaboration of the class society and the technological and engineering company. In 2010, RS performed the Approval in Principle (AiP) of GTT technologies for membrane LNG containment and transportation systems and their installation on Arc7s. ■

NEWS NUDGE

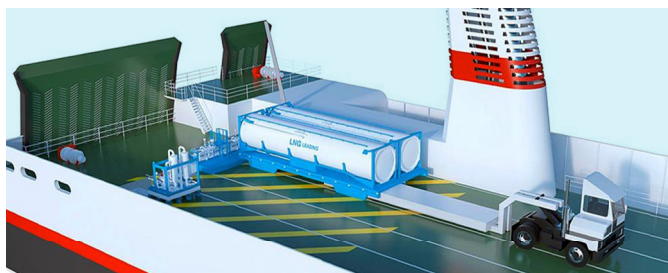
FLEX LNG submits draft registration for proposed NYSE listing

FLEX LNG Ltd has confidentially submitted a draft registration statement on Form 20-F to the US Securities and Exchange Commission (SEC) relating to the proposed listing of its ordinary shares on the New York Stock Exchange.

No new securities will be issued in connection with the listing, which is expected to commence after the SEC completes its review process. ■

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WORLD LNG CARRIER ORDERBOOK

Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
JMU	SPB	165000	TFDE	Apr-19	Feb-14	MOL
JMU	SPB	165000	TFDE	Jul-19	Feb-14	MOL
JMU	SPB	165000	TFDE	Apr-19	Feb-14	NYK
DSME	GT NO 96	173400	MEGI	May-19	Jun-14	Maran Gas Maritime
DSME	GT NO 96	172000	TFDE - Azipod	Jul-19	Jul-14	Teekay LNG
DSME	GT NO 96	172000	TFDE - Azipod	Aug-19	Jul-14	Teekay LNG
DSME	GT NO 96	172000	TFDE - Azipod	Oct-19	Jul-14	Teekay LNG
DSME	GT NO 96	172000	TFDE - Azipod	Nov-19	Jul-14	Teekay LNG
DSME	GT NO 96	172410	TFDE - Azipod	Sep-19	Jul-14	MOL
Kawasaki	Moss	155000	TFDE	Dec-19	Sep-14	MOL
DSME	GT NO 96	173400	MEGI	Apr-19	Nov-14	BP
Mitsubishi H.I.	Moss	177000	STaGE	Sep-19	Jan-15	MOL
DSME	GT NO 96	173400	MEGI	Sept-19	Sep-15	BWGas
Kawasaki	Moss	177000	STRH	Jul-19	Sep-15	MOL
Mitsubishi H.I.	Moss	165000	STaGE	May-19	Nov-15	Mitsubishi
Mitsubishi H.I.	Moss	180000	STaGE	Jun-19	Nov-15	NYK
Mitsubishi H.I.	Moss	180000	STaGE	Feb-19	Nov-15	NYK
Hyundai Heavy	GTT Mark III Flex	180000	XDF	Apr-19	May-16	SK Shipping
Hyundai Heavy	GTT Mark III Flex	180000	XDF	May-19	May-16	SK Shipping
DSME	GT NO 96	173400	MEGI	Oct-19	Jun-16	Maran Gas Maritime
DSME	GT NO 96	173400	MEGI	Nov-19	Jun-16	Maran Gas Maritime
DSME	GT NO 96	173400	MEGI	Apr-20	Dec-16	Maran Gas Maritime
Hyundai Heavy	GTT Mark III Flex	180000	MEGI	May-19	Mar-17	Knutsen
DSME	GT NO 96	173400	MEGI	Jun-19	Mar-17	Flex LNG
DSME	GT NO 96	173400	MEGI	Aug-19	Mar-17	Flex LNG
Hyundai Heavy	GTT Mark III Flex	180000	MEGI	Jun-19	May-17	Knutsen
Hudong-Zhonghua	GT NO 96	174000	MEGI	Dec-19	Jul-17	MOL
Hudong-Zhonghua	GT NO 96	174000	MEGI	Mar-20	Jul-17	MOL
Hudong-Zhonghua	GT NO 96	174000	MEGI	Jul-20	Jul-17	MOL
Hudong-Zhonghua	GT NO 96	174000	MEGI	Oct-20	Jul-17	MOL
Samsung	GTT Mark III Flex	180000	XDF	Jun-19	Dec-17	GasLog
DSME	GT NO 96	173400	MEGI	May-20	Dec-17	Maran Gas Maritime
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-20	Jan-18	NYK
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jan-20	Jan-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-20	Jan-18	Sovcomflot
DSME	GT NO 96	173400	MEGI	Dec-19	Feb-18	BWGas
DSME	GT NO 96	173400	MEGI	Jun-20	Feb-18	BWGas
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-20	Feb-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Apr-20	Feb-18	Cardiff Marine
DSME	GT NO 96	173400	MEGI	Aug-20	Feb-18	John Fredriksen
DSME	GT NO 96	173400	MEGI	Sep-20	Feb-18	John Fredriksen
Hyundai Heavy	GTT Mark III Flex	174000	XDF	May-20	Mar-18	Flex LNG
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jul-20	Mar-18	Flex LNG
Samsung	GTT Mark III Flex	180000	XDF	Apr-20	Mar-18	GasLog

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 = 4th April 2019

Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
Samsung	GTT Mark III Flex	174000	XDF	Mar-20	Mar-18	Cardiff Marine
DSME	GT NO 96	173400	MEGI	Dec-20	Mar-18	Minerva Marine
DSME	GT NO 96	173400	MEGI	Jan-21	Mar-18	Minerva Marine
Hyundai Heavy	GTT Mark III Flex	180000	MEGI	Jun-20	Mar-18	Knutsen
DSME	GT NO 96	173400	MEGI	Aug-20	Mar-18	Alpha Gas
DSME	GT NO 96	173400	MEGI	Dec-20	Mar-18	Alpha Gas
Samsung	GTT Mark III Flex	180000	XDF	Sep-20	May-18	GasLog
DSME	GT NO 96	173400	MEGI	Oct-20	Jun-18	Maran Gas Maritime
DSME	GT NO 96	173400	TFDE	Apr-21	Jun-18	Maran Gas Maritime
DSME	GT NO 96	173400	MEGI	Apr-21	Jun-18	Alpha Gas
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Sep-20	Jun-18	Thenamaris
Hyundai Heavy	GTT Mark III Flex	174000		Feb-21	Jun-18	Flex LNG
Hyundai Heavy	GTT Mark III Flex	174000		May-21	Jun-18	Flex LNG
Hyundai Heavy	GTT Mark III Flex	174000		Oct-20	Jul-18	Capital Gas
Hyundai Heavy	GTT Mark III Flex	174000		Nov-20	Jul-18	Capital Gas
Hyundai Heavy	GTT Mark III Flex	174000		Mar-21	Jul-18	Capital Gas
Hyundai Heavy	GTT Mark III Flex	174000		Jun-21	Jul-18	Capital Gas
DSME	GT NO 96	173400	MEGI	Nov-20	Jul-18	John Fredriksen
Samsung	GTT Mark III Flex	180000	XDF	Dec-20	Aug-18	Celsius Shipping
Samsung	GTT Mark III Flex	180000	XDF	Mar-21	Aug-18	Celsius Shipping
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Sep-20	Aug-18	Cardiff Marine
Samsung	GTT Mark III Flex	174000	XDF	Oct-20	Aug-18	GasLog
Samsung	GTT Mark III Flex	174000	XDF	Dec-20	Aug-18	GasLog
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Sep-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Sep-18	Thenamaris
Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Sep-18	NYK
Samsung	GTT Mark III Flex	174000	XDF	Jan-21	Oct-18	Minerva Marine
Samsung	GTT Mark III Flex	174000	XDF	Sep-21	Oct-18	Minerva Marine
Samsung	GTT Mark III Flex	174000	XDF	Feb-21	Nov-18	Cardiff Marine
Samsung	GTT Mark III Flex	174000	XDF	Jan-21	Nov-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Nov-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Apr-21	Nov-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Nov-18	Latsco Shipping
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Nov-18	Latsco Shipping
Samsung	GTT Mark III Flex	174000	XDF	Aug-21	Dec-18	NYK
Samsung	GTT Mark III Flex	174000	XDF	Nov-21	Dec-18	NYK
DSME	GT NO 96	174000	MEGI	Feb-21	Dec-18	BWGas
DSME	GT NO 96	174000	MEGI	Jun-21	Dec-18	BWGas
DSME	GT NO 96	173400	MEGI	Jun-21	Dec-18	Maran Gas Maritime
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Nov-20	Dec-18	NYK
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	NYK
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-21	Dec-18	NYK
DSME	GT NO 96	180000	MEGI	Dec-20	Dec-18	MOL
DSME	GT NO 96	173400	MEGI	Jun-21	Dec-18	MOL
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Sep-20	Dec-18	Sovcomflot

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
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Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Dec-18	Sovcomflot
Samsung	GTT Mark III Flex	180000	XDF	Jun-21	Dec-18	GasLog
Samsung	GTT Mark III Flex	180000	XDF	Aug-21	Dec-18	GasLog
Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	Cardiff Marine
DSME	GT NO 96	174000	MEGI	Jun-21	Dec-18	Alpha Gas
Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	Navigare
Samsung	GTT Mark III Flex	180000	XDF	Jun-21	Feb-19	Celsius Shipping
Samsung	GTT Mark III Flex	180000	XDF	Sep-21	Feb-19	Celsius Shipping
Hudong-Zhonghua	GT NO 96	178000	XDF	Sep-21	Feb-19	CSSC
Hudong-Zhonghua	GT NO 96	178000	XDF	Feb-22	Feb-19	CSSC
DSME	GTT Mark III Flex	174000	MEGI	May-21		Nakilat
Samsung		174000		Sep-22		Sinokor
Samsung		174000		Sep-22		Sinokor
Samsung		174000		Sep-22		Sinokor
Samsung		174000		Sep-22		Sinokor
DSME	GTT Mark III Flex	173400	XDF	Aug-21		Nakilat
DSME	GTT Mark III Flex	173400	XDF	Oct-21		Nakilat
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-21		Capital Gas
Samsung		174000		Mar-22		Nisshin 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 = 4th April 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	Aman Hakata	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	Norgas Creation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2010	Norgas Innovation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
2011	Norgas Conception	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Norgas Invention	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
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
2014	LNG-Oil combi**	2,000	LNG	Germany	Yes	Veka
2014	Short Sea LNG Tanker **	4,000	LNG	Germany	Yes	Veka
2015	LNG Inland bunker**	800	LNG	Germany	Yes	Veka
2015	LNG bunker barge 1†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 2†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 3†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	10 small carriers TBN**	5,000	LNG			Bimantara Group
2015	Jahre TBN**	6,200	LNG	Norway	Yes	Donsotank/Jahre Marine
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
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	TBN 1	27,500	LNG	China?		Danyang?
2015	TBN 2	27,500	LNG	China?		Danyang?
2015	TBN 3	27,500	LNG	China?		Danyang?
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)
2016	Navigator Aurora	35,000	Ethane/Ethylene	Markus Hood - Stenungsund	Ethane, for Borealis	Navigator
2016	Gaschem Beluga	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Gaschem Orca	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services

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 = 4th March 2019

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
2016	Ocean Yield TBN**	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2017	Oizmendi	600	LNG	Bilbao	Yes	Itsas Gas
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
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
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 EnergyICE	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	Yuan He 1	30,000	LNG	China	Yes	CSR
2017	Navigator Eclipse	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Nova	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Prominence	35,000	Ethane/Ethylene	US	Ethane	Navigator
2018	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang
2018	CME TBN†	2,200	LNG	US Coast	Yes	CME
2018	Shell Bunker Barge TBN 4	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	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
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
2020	Shell Bunker Barge	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	Total TBN	18,600	LNG	NWE	Yes	MOL
2020	FuelLNG TBN	7,500	LNG	Singapore	Yes	FuelLNG
2020	CLS TBN	3,500	LNG	Japan	Yes	CLS
2020	Eesti Gaas TBN	6,000	LNG	NWE	Yes	Eesti Gaas
2020	ENN TBN	8,500	LNG	China	Yes	ENN
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
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

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