

LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS

12 December 2019

European LNG imports surge

LNG is playing an increasingly important role in Europe's energy supply mix.

Following a period of low utilisation of Europe's LNG import terminals between 2012 and 2017, European LNG imports surged from the third quarter of 2018 onwards, and peaked in the spring of 2019, reported Italian-based broking house Banchero Costa.

This rise was primarily due to the reversal of a multi-year trend of higher Asian LNG prices over European wholesale gas market prices, and more limited volumes of pipeline gas arriving from Norway and Russia.

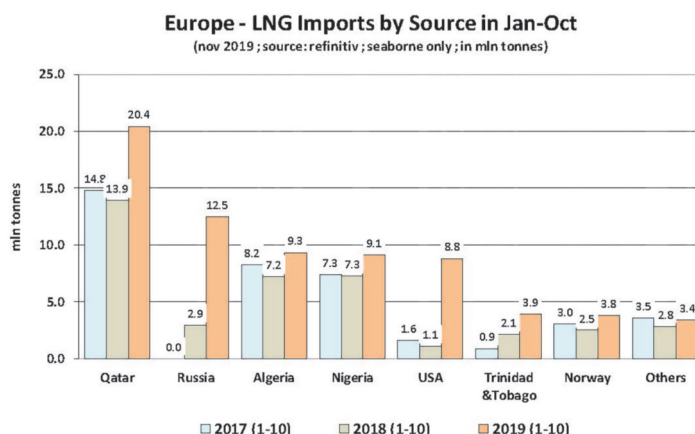
A significant proportion of the increased European LNG deliveries were spot cargoes, showing a trend away from long term LNG supply contracts, which were the foundations of the European LNG market.

Europe's dozen LNG-importing countries imported 52.9 mill tonnes of LNG in 2018 (about 4 mill tonnes of which was re-exported)- representing about 17% of global LNG trade.

In the first 10 months of 2019, based on Refinitiv vessel tracking data, Europe's LNG imports surged to 71.1 mill tonnes, representing an increase of +78.9% year-on-year.

On balance, Northern European LNG import terminals have received higher levels of additional LNG volumes than their Southern European counterparts.

The highest increases were in France (mainly Montoir and Dunkirk), the Netherlands (Rotterdam), Belgium (Zeebrugge), the UK (Milford Haven and Isle of



Source: Banchero Costa

Grain). LNG imports into Spain - which has the largest regasification capacity in Europe - increased relatively more slowly, in part due to Spain's relatively illiquid gas wholesale market.

Spain top

This year, the largest European importer was Spain with 13.91 mill tonnes of LNG in the first 10 months, with France close behind with 13.12 mill tonnes.

Following is the UK (9.41 mill tonnes), Italy (8.47 mill), Turkey (6.99 mill), the Netherlands (5.16 mill), Belgium (4.92 mill), Portugal (3.73 mill), Poland (1.95 mill), Greece (1.63 mill) and Lithuania with 1.06 mill tonnes, the broker said.

Significant changes also occurred in the sourcing of LNG cargoes. Qatar was still the largest supplier of LNG to Europe - with 20.4 mill tonnes, it accounted for

28.7% of Europe's imports in the first 10 months of 2019. However, its share sharply decreased from 34.9% in 2018 and 37.5% in 2017.

Volumes from Algeria, Nigeria, and Norway increased slowly to 9.3, 9.1 and 3.8 mill tonnes, respectively. On the other hand, a dramatic surge in volumes was seen from Russia and the US.

Russian imports reached 12.5 mill tonnes in the first 10 months of 2019, up from just 2.9 mill tonnes in the same period last year. Russia now accounts for 17.5% of Europe's seaborne LNG imports.

Equally impressive was the rise in US LNG exports to Europe, which surged to 8.8 mill tonnes in the first 10 months of 2019, up from just 1.1 mill tonnes in the same period last year - the US accounted for 12.4% of Europe's LNG imports this year, Banchero Costa concluded.

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“A significant proportion of the increased European LNG deliveries were spot cargoes, showing a trend away from long term LNG supply contracts, which were the foundations of the European LNG market.”

Bahri to enter LNG market

Saudi Aramco's shipping arm Bahri was said to have issued an expression of interest (EOI) to charter up to 12 LNGCs from 2025.

No further details were immediately available and Saudi Aramco declined to comment, Reuters reported.

Bahri's EOI is thought to be part of Aramco's expansion into LNG trading, as it boosts gas production and considers expanding its LNG investments, sources told the newswire.

The Saudi state oil giant plans to become a major global gas player and has been developing its own gas resources as well as eyeing gas assets in the US, Russia, Australia and Africa, the company's CEO and the Saudi energy minister had previously said.

In May, Saudi Aramco signed a 20-year agreement to buy LNG from the planned Semptra export

terminal in Port Arthur, Texas. It also agreed to buy a 25% equity stake in the first phase of the multi-billion dollar project.

The company's trading arm, Aramco Trading Co, is also expected to hire an LNG trader to join its team in Singapore in January, industry sources were quoted as saying.

It already has an LNG executive in Singapore to develop its business and has so far struck deals to supply LNG to Bangladesh and possibly to Pakistan.

"They are basically leveraging on their oil partnerships with some countries to market LNG as well," an undisclosed source told Reuters. ■

GAIL bids for up to 10 US cargoes

GAIL (India) has reportedly requested offers for up to 10 LNG cargoes to load in the US.

Loading dates are spread between early 2020 to early 2021, sources told Reuters last week.

The cargoes will be negotiated through its Singapore subsidiary on a free-on-board (FOB) basis and will be loaded at Sabine Pass and Cove Point. They will be priced on Henry Hub, one of the sources said.

GAIL Global (Singapore) has offered three cargoes for loading from the Sabine Pass plant between 28th and 30th March, 10th-12th June and 28th-30th June next year, the source added.

Also offered were seven cargoes from Cove Point, with four loading between 25th -27th April, 27th-28th July, 27th-29th August 27-29 and 11th - 20th

December, 2020.

The final three cargoes will load in 2021 between 21st and 30th January, 11th - 20th February and 21st and 28th of that month.

Bids were thought to be due early this week, another source said.

GAIL has negotiated 20-year contracts to buy 5.8 mill tonnes a year of US LNG, split between Dominion Energy's Cove Point and Cheniere Energy's Sabine Pass.

The energy group's managing director said earlier this year that it ships most of its US LNG to India and sells the rest into the spot market. All of the gas will eventually be shipped to India when more gas pipelines and regasification terminals are completed, Shri BC Tripathi said in March, Reuters reported. ■

Santos upgrades 2025 production target

Santos has lifted its 2025 production target to 120 mill barrels of oil equivalent (boe), more than double 2018's output.

The new target, up from 100 mill boe set in 2018, represents a cumulative annual growth rate in production of over 8% to 2025.

Speaking at the company's Investor Day in Sydney on 2nd December, Santos Managing Director and CEO, Kevin Gallagher, said the successful execution of Santos' 'transform-build-grow' strategy since 2016 has the company positioned for disciplined growth and sustainable shareholder returns.

"Our strategy has been to establish a disciplined low-cost operating model that delivers strong

cash flows through the oil price cycle. Our 2019 forecast free cash flow breakeven oil price is now -\$29 per barrel," Gallagher said.

"The recently announced acquisition of ConocoPhillips' interests in northern Australia and Timor-Leste will further reduce our breakeven oil price and deliver operating interests in long-life, low-cost conventional natural gas assets and strategic LNG infrastructure.

"We are now positioned for disciplined growth leveraging existing infrastructure in all five of our core assets, which we believe

will deliver 120 mill boe by 2025," he said.

This disciplined growth portfolio includes:

- Barossa LNG - targeting FID around the end of 1Q20.
- Dorado liquids - targeting FEED-entry 2Q20.
- PNG LNG expansion - targeting FEED-entry in 2020.
- GLNG ramp-up to around 6.2 mill tonnes per annum sales from 2020.
- Cooper Basin production growth.

Gallagher also said that Santos

was well positioned to fund growth out of operating cash flow and debt while maintaining gearing levels within the company's target range through the major growth phase, with rapid de-gearing expected thereafter.

"Natural gas is forecast to supply a quarter of the world's total energy demand by 2040. Through our Energy Solutions business, we are investing in projects to lower emissions and assessing the significant potential for carbon capture and storage in the Cooper Basin," he added. ■

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More investment need - EIC

More investment in projects is needed to fill the expected LNG supply gap in the mid-2020s, the latest Energy Industries Council (EIC) Insight Report claimed.

As countries worldwide strive to meet air quality and climate targets and seek a change in their energy mix, the IEA forecast that gas will overtake coal as the second leading source of energy consumption by 2030.

EIC's Insights report: 'Global outlook for LNG liquefaction and regasification,' provides an overview on the role natural gas must play in overcoming the energy challenge of meeting consumer demand while minimising carbon emissions.

Speaking at the Budapest LNG Summit last week, Neil Golding, EIC's Head of Oil and Gas, said: "The LNG market represents significant opportunities for the supply chain as projects continue to evolve and a key focus is keeping a handle on costs of the developments and for the projects to be delivered on schedule. New innovations are evolving including several smaller small-scale projects where floating liquefaction is used to tap remote gas fields

and unlock stranded resources.

"Modularisation is continuously growing, as it offers a benefit especially for remote projects achieving faster execution. Equally important is the role LNG will have in the energy transition both globally and in the UK. The UK has a key role to play with significant import capacity and sees proposals to increase capacity to help meet future energy needs," he added.

Key findings include:

- Current global liquefaction capacity, which is around 430 mill tonnes per annum, is due to increase by an estimated 295 mill tonnes of capacity under construction.
- The US, which is now a net exporter of natural gas following the shale boom, is projected to account for the highest growth in liquefaction capacity until at least 2026.
- The current global capacity for regasification, is about 830 mill tonnes per annum with an estimated 130 mill tonnes of

capacity under construction.

- India is projected to account for the highest increase in capacity within the period until 2025, with China becoming the top importer of LNG.
- The capacities of the projects that have reached FID this year stands at 62.7 mill tonnes per annum, which is almost double of what was reached from 2016-2018 (34.8 mill tonnes) combined.
- Mozambique is developing projects, which could put it in a position to be one of the leaders in the LNG export market.

Tayo Idowu, EIC Midstream & Downstream Energy Analyst and author of the report, commented: "As LNG continues to grow in new markets like vessel bunkering, partly due to the IMO2020 regulation to reduce sulfur limit in fuel oil to 0.5%, and countries diversifying their energy mix with gas, there is increasing competition amongst exporters for market share." ■

Cameron Train 2 reaches commissioning stage

Train 2 of the US Gulf Cameron LNG project, located in Hackberry, LA, reached final commissioning stage earlier this month.

According to McDermott International and joint venture partner, Chiyoda International Corp, a US-based wholly-owned subsidiary of Chiyoda Corp, Japan, the commissioning included the introduction of pipeline feed gas into Train 2 of

the liquefaction export facility, the precursor for LNG production.

McDermott announced introduction of feed gas to Train 1 on 15th April, 2019, which was followed by first liquid on 14th May and first cargo from Train 1

on 31st May. On 19th August, Cameron LNG announced that Train 1 began commercial operation, following substantial completion.

McDermott and Chiyoda have provided the engineering, pro-

curement and construction (EPC) for the Cameron LNG project since the initial award in 2014. The project includes three liquefaction trains with a projected export of 12 mill tonnes per annum of LNG. ■

First Elba export cargo suffers slight delay

The first LNGC due to load at Kinder Morgan's Elba liquefaction facility was still alongside on Wednesday morning, according to Marine Traffic.

'Maran Gas Lindos' was originally expected to leave by Wednesday evening, but her departure could be pushed to Thursday morning, due to slow loading, sources told S&P Global Platts.

On the back of a 20-year off-take agreement with Shell, Elba will become the sixth major US

LNG export facility, almost five months after production began at the site located near Savannah, Georgia.

Since production began on 17th July, Kinder Morgan has declined to comment on Elba operations, while Shell has not responded to multiple requests for comment, Platts said.

After berthing at Elba over the weekend, there were several minor issues identified during loading, including a terminal valve not working and several onshore valves shutting down, due to pressure in a shore line increasing rapidly and activating an emergency procedure, according to log

records seen by Platts.

The LNGC reportedly shifted to another berth on Monday afternoon.

Elba will have a capacity of 2.5 mill tonnes per year when all 10 trains planned are completed during the first half of next year. Several trains have come online since initial production began. ■

NEWS NUDGE

TEN extends LNGC charter

TEN Ltd has extended the charter of an LNGC for a minimum one, maximum three, year period.

A new increased rate is due to start in the first quarter of 2020 and expected to generate around \$30 mill of gross revenues.

"We are delighted to continue the employment of our LNGC to one of the industry's top names which highlights TEN's operational capabilities in this highly demanding sector," George Saroglou, TEN COO, said.

"The LNG sector continues to be an area of increasing interest to us and the recent newbuilding order is a testament to that. TEN's diversified fleet of crude, product, shuttle tankers and LNG carriers, provides management with the flexibility to choose the most accretive business in each segment, in today's strong tanker market environment," he added, without giving details of the vessel or charterer. ■

Montoir fully booked between 2023-2035

French energy concern Elengy conducted an open subscription period (OSP) for the Montoir-de-Bretagne LNG terminal, from July to November, 2019.

The OSP consisted of offering the unsubscribed regasification capacity - more than 3.5 bill cu m per year - for the period 2021 to 2035.

It was endorsed by the French Energy Regulatory Commission

(CRE).

As a result, the Montoir-de-Bretagne terminal is now fully booked between 2023 and 2035 with only few slots remaining in 2021 and 2022.



Montoir is a leading transshipment hub

This result reflects the dynamism of the LNG market, as well as the appetite for regasification capacity in France, gateway to Northwest Europe gas markets. Furthermore, it shows that gas has an important role to play in the energy transition in Europe in the coming years, Elengy claimed.

To better meet clients expectations, Elengy and its subsidiary Fosmax LNG, owner of the Fos Cavaou LNG terminal near Marseille, will study different development options for offering capacities at Fos Cavaou LNG terminal beyond 2030 and at Montoir-de-Bretagne beyond 2035.

These two terminals offer direct access to European markets, with their strategic positions on

the Mediterranean and Atlantic coasts. Their services on offer also make them competitive LNG hubs: cargo discharge, ship reloading, ship-to-ship transshipment, cooling-down, gassing-up, LNG bunkering, truck loading, etc.

Commissioned in 1980, Montoir-de-Bretagne LNG terminal, part of Nantes-Saint-Nazaire Port, offers 360 000 cu m storage capacity and two berths, capable of accommodating up to Q-Max LNGCs.

Elengy has invested in recent years to transform and modernise the infrastructure. Montoir-de-Bretagne LNG terminal is the leader in Europe for LNG transshipment operations, a service implemented in April, 2018, the company claimed. ■

Botas to invest in FSRU

Turkey's state oil and gas concern Botas is to purchase a newbuilding FSRU.

A company official told S&P Global Platts that the new vessel would be used to supply gas to two onshore terminals — the existing terminal at Dortyol on Turkey's East Mediterranean coast and a new terminal being built on the Gulf of Saros in northwest Turkey.

He also said the Dortyol terminal was underused at present and

that the lease on the existing FSRU would not be renewed. Instead the company is buying a vessel, construction of which is expected to be completed next year.

The new vessel will be used to supply gas more frequently at the new Saros terminal, as most of Turkey's gas demand is in the northwest of the country, he said.

Botas is currently constructing a jetty and terminal at Saros.

According to the 2020 Turkish economic programme, next year Botas will open a tender for the construction of a link line between the new Saros terminal and the company's existing transit grid, specifically for the Turkey/Greece interconnector, which passes nearby. ■

Freeport up and running

Freeport LNG started commercial operations with its first liquefaction train on 8th December, 2019.

Freeport's Train 1 is part of a multi-train liquefaction facility under construction on Quintana Island near Freeport, Texas.

"This is a significant milestone for Freeport LNG and we now look forward to commencing commercial operations of Trains 2 and 3," said Michael Smith, Founder, Chairman and CEO, Freeport LNG.

Train 2's commissioning work

continues to progress with commercial operations expected to start in January, the company said, adding that construction on Train 3 is nearly complete with commercial operations expected in May, 2020.

Freeport LNG's three trains are expected to produce in excess of 15 mill tonnes per annum. A fourth train is under development

and Freeport LNG has raised just over \$1 bill for Train 4 which, combined with a contemplated bank facility, will provide the capital required.

Train 4's final investment decision (FID) is targeted for the first quarter of 2020. When Train 4 comes on line, Freeport LNG will rank as the eighth largest LNG facility globally. ■

NEWS NUDGE

Adriatic LNG offers peak shaving service

Adriatic LNG has tendered for next winter's peak shaving service to supply one LNG cargo of between 60,000 and 70,000 cu m.

The tender will close on 17th December and LNG will have to be unloaded at the terminal in one of the available unloading slots in January and February.

This move is aimed at making available to SNAM Rete Gas, in the first quarter of 2020, previously stored gas, in the form of LNG, in order to meet possible peaks in demand during wintertime. ■



Adriatic has tendered for a 'peak shaving' cargo

Canadian export license granted

Earlier this month, the Canada Energy Regulator (CER) approved a revised application from Chevron Canada to export LNG for a period of 40 years.

This was an increase from the 20 years previously approved.

In reviewing the application, the CER said that the natural gas that Chevron plans to export would be surplus to the needs of Canadians, both today and in the future.

In its application, Chevron Canada said that it intends to export up to 28.23 bill cu m of natural gas per year.

However, this decision does not come into effect until it is

approved by Governor in Council, the CER explained.

LNG exports would be undertaken from Kitimat, British Columbia, by Kitimat LNG, a joint venture between Chevron and a Canadian subsidiary of Woodside Energy.

It was believed that a final investment decision (FID) will be taken in the mid-2020s, with plant completion due around 2030.

Kitimat LNG received an envi-



Kitimat's export terminal has moved a step closer

ronmental certificate for the project in 2006 for what was originally proposed as an LNG import terminal.

The revised proposal calls for more LNG trains, an additional berth for LNGCs, and an increase in LNGC calls - up to 250 per year.

PGNiG enters small scale LNG market

Polish Oil and Gas Co (PGNiG) is to be the sole user of the small-scale LNG reloading station in Klaipeda, Lithuania for five years.

This is an important step for PGNiG in building competence and position on this market in Central and Eastern Europe and the Baltic Sea basin, the company said.

The contract with Klaipėdos Nafta (KN) was signed late last month in Klaipeda and operations will start in April, 2020.

KN is the operator of oil terminals and the Klaipeda FSRU terminal, as well as operator of a small-scale LNG reloading station.

This installation is located at the entrance to Klaipeda port - about 7 km from the FSRU.

"Klaipėdos Nafta appreciated our experience in operations and sales of small-scale LNG from the President Lech Kaczyński Terminal in Świnoujście and from our LNG facilities in Odolanów and Grodzisk Wielkopolski," said Piotr Woźniak, President of the PGNiG Management Board. "PGNiG will also gain better access to the small-scale LNG market in the Baltic countries and increase the competitiveness of its offer for customers from the area of north-eastern Poland and Central and Eastern Europe, due to the use of the onshore LNG reloading station

in Lithuania.

"It is very important from the point of view of security of supply that PGNiG will independently decide from whom to buy and bring LNG to the onshore reloading station in Lithuania," he added.

The onshore LNG reloading station is equipped with five LNG tanks with a total capacity of 5,000 cu m. It has a wharf adapted to receive and load LNG onto smaller scale vessels. The transshipment rate is 1,250 cu m of LNG per hour, while the bunkering speed of ships is 250-500 cu m of LNG per hour.

"Having a strategic partner will bring a great synergy enabling the LNG reloading station operated by KN. Development of small-scale and off grid LNG markets in Baltic countries and Poland brings various new opportunities to make supply of cleaner energy for businesses across the region more accessible. It will also provide more possibilities to diversify the supply for the industrial objects and settlements remote from the pipeline, as well as for road and maritime transport," said Dariusz Ślęskis, KN CEO. ■

NEWS NUDGE

More newbuildings reported

Brokers reports have indicated that the recently reported Samsung LNGC order was for five 170,000 cu m Arc7s at around \$300 mill each for Russian interests.

To be delivered in 2022, they will be built by Zvezda Shipbuilding under a joint venture agreement with Samsung, which will design the vessels.

Elsewhere, Maran Gas was said to have ordered a seventh 174,000 cu m LNGC this year at Daewoo.

She is due to be delivered in the first quarter of 2022.

In addition, Hyundai Samho Heavy Industries (HSHI) has won a contract to construct a 174,000 cu m LNGC for H-Line, the second gas carrier ordered by the South Korean concern this year.

The contract was said to be worth KRW226.8 bill (\$190.5 mill) and the newbuilding is expected to be handed over by 15th June, 2022, HSHI said in a stock exchange filing on 6th December.

In the small-scale segment, Korea Line has ordered one, option one, 18,000 cu m small-scale/bunkering vessel from Hyundai Mipo Dockyard. ■

Estimated to cost \$61.3 mill, she is due for delivery in 2022 and will be chartered to Shell.

In addition, Titan LNG has contracted Norwegian shipbroker Fearnleys to run the tender process for a new 8,000 cu m LNG bunker barge.

The technical and economic feasibility assessment was finalised by the company's newbuilding team.

New loading arm guidance to be published

OCIMF's 'Design and Construction Specification for Marine Loading Arms, Fourth Edition' is due out 13th December.

This publication provides guidance to owners and vendors on designing and procuring marine loading arms (MLAs). It serves as a definitive guide to MLA construction and specification, covering topics, such as applications, variability, operating envelopes, products transferred, servicing, manifold spacing, jetty and piping layouts and arm styles.

It also includes guidance for LNG MLAs to supplement the ISO standard.

With the publication of this edition, the third edition will be superseded and removed from distribution, OCIMF said. ■

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GTT teams up with WISON - wins more orders

GTT has signed a technical assistance and license agreement (TALA) with Chinese shipyard WISON Offshore & Marine (WOM).

This agreement calls for the fitting of systems on board FLNGs, FSRUs, FSRPs and LNGCs, with GTT's membrane solutions.

WOM was the first in the world to deliver a barge-based FLNG and FSRU on a turnkey basis. The Chinese builder obtained its GTT license following the completion of a qualification process that began earlier this year, including the construction of Mark III technology mock-up.

This agreement will enable both partners to further expand

their offer to shipowners, to target new markets, especially focusing on floating based solutions, and to advance the development of LNG in the global supply chain, they said.

Philippe Berterottière, GTT Chairman and CEO, said: "We are pleased to count WISON among our newbuilding partners. We are very interested in developing and building together new LNG infrastructures which can provide innovative natural gas value chain solutions."

An Wenxin, WISON Offshore &

Marine President and COO added:

"We are very proud to be licensed by GTT for membrane technologies. This will allow us to offer more actively LNG solutions with GTT's technologies in China, which is what the market is asking for."

Recently, GTT received orders to design the tanks of five more LNGC newbuildings.

Three will be built on behalf of European shipowners at an undisclosed Asian shipyard. Their deliveries are scheduled for between the end of 2021 and mid-2022.

The names of the contracting parties and the characteristics of the vessels remain confidential at this stage, GTT said.

Another two systems were ordered by Samsung Heavy Industries (SHI) for a pair of MISC newbuildings.

Each MISC vessel will have a capacity of 174,000 cu m. They be fitted with the Mark III Flex+ membrane containment system. The delivery of these vessels is planned during the first quarter of 2023.

BV awards AiP for LNGBV concept

Bureau Veritas Marine & Offshore (BV) has granted approval in principle (AiP) to the design for a 19,000 cu m LNG bunkering vessel with a GTT membrane type tank.

Dubbed the 'Quadrelprop', this reflects features in the design and propulsion arrangements to enable high manoeuvrability and station keeping. These include:

- Four azimuth (360 deg) thrusters fitted at each corner of the hull.
- Four dual fuel generator sets installed in the engine room compartment and complemented by an energy storage system provide power to the ship and in particular to the electric thruster motors.
- The azimuth capability is enhanced and controlled by a redundant dynamic positioning (DP) system.

Speaking at Marintec in Shanghai last week during the presentation of the AiP to Marinnow, Matthieu de Tugny, BV Marine & Offshore President, said: "This project underlines just how fast and far the industry is going to meet tomorrow's challenges today and it is a great pleasure to hand over this approval for such an exciting design."

The high precision of the design's DP system allows 'Quadrelprop' to keep position relative to the ship being bunkered so that the LNG transfer system is always within a safe working envelope.

Also thanks to the DP system, ship-to-ship LNG bunkering operations can also be undertaken safely at anchorage and in waiting areas.

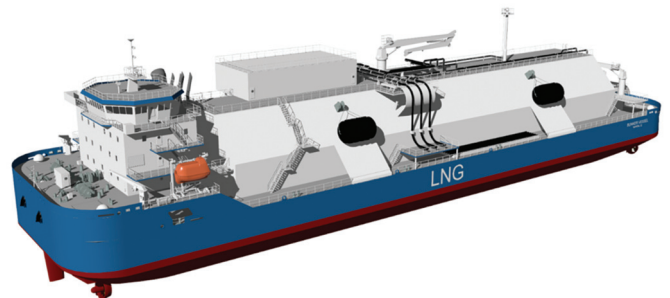
The absence of mooring requirements with the ship not only simplifies and shortens the overall duration of the bunkering operation but also allows the bunker ship to immediately move away from the vessel in case of an emergency shut down and disconnection of transfer hoses.

Two LNG bunkering manifolds are provided: at amidships, port-side, with large diameter connections allowing a maximum transfer flow rate of 2,000 cu m per hour and a stern bunkering manifold with smaller diameters allowing a transfer flow rate of 250 cu m per hour.

The starboard side amidships manifold is dedicated to LNG loading at a terminal and is designed for high loading flow rate.

Coastal navigation

The vessel is claimed to be particularly well adapted to coastal navigation and port operations with exceptional manoeuvring capabilities and a very high level of safety with a full 'B/5' wide double hull protecting the cargo tanks area and the engine room, as well as a



BV has awarded an AiP for an LNGBV

full redundancy of main and auxiliary equipment required by the BV's DP2 notation.

Claude Maillot, BV's Senior Vice President, commented: "It is appropriate that we present this approval at Marintec - the leading showcase for marine technology this year - as China will be building so many of the ships that will be needed to meet the challenge of creating a cleaner shipping industry."

Technical consultancy Marinnow developed the design with engi-

neering support from ship designer Marine Assistance. Design work was undertaken in close collaboration with GTT and Air Liquide for the optimised solution adopted combining an insulation system of the twin LNG cargo tanks using Mark III Flex technology and a sub-cooling unit type TBF-700 providing the vessel with an LNG and vapour handling system covering the whole spectrum of the intended cargo operations and services to customers.

LNG rate assessments

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

Region	This week	Change*
East of Suez	\$87,000	-\$34,500
West of Suez	\$95,000	-\$17,500
12 mos T/C	\$77,000	-\$4,000

Since last report 13/11/19

Source: Fearnleys (11/12/19)

Hyundai LNG signs cyber security MoU

The Korean Register (KR) and Hyundai LNG Shipping (HLS) signed a memorandum of understanding (MOU) on 2nd December, agreeing to conduct joint research on the application, verification and development of maritime cyber security systems guidance.

This MOU brings together KR's maritime cyber security certification capability and HLS's expertise in cyber security technology.

Under the agreement, the two companies will jointly verify cyber security solutions applicable to new ships and will develop the systems risk analysis and design safety evaluations.

The IMO's Resolution of MSC.428(98), adopted MSC98 in June, 2017, will increase demand for cyber security risk management from 2021. As a result, administrations will have to ensure that cyber risks are appropriately addressed in safety management systems no later than the first annual verification of the company's Document of Compliance after 1st January, 2021.

"The MOU and resulting joint research conducted with HLS will strengthen KR's capabilities in the

certification of new ships, ensuring our organisation's position as technological industry leader in maritime cyber security sector," said Ha Tae-bum, executive vice president of KR's R&D Division.

"HLS is pleased to sign this important MoU with KR, as a commitment to develop our proactive cyber security expertise to further support shipowners and their vessels when the new regulations come into force," said Choi Jang-pal, HLS' Head of Business Operation Division.

Demand for cyber security protection has grown in recent years because of the rapid convergence of ship's operational information and communication technologies and the increased exchange of information between ship and ship and ship to shore, respectively.

KR established a maritime cyber security certification sys-



The signing ceremony

tem last year and provides cyber security certification services for companies and ships, and cyber security type approval services for networks and automation

systems of ships.

KR's certification system is fully aligned with ISO, IEC, IMO and BIMCO marine cyber security guidelines, the class society said. ■

LNG Shipping News

As this is the last edition before the holiday season, we would like to thank our readers and advertisers for their support throughout the year and wish

you the compliments of the season.

The next LNG SN is due to be published on the 9th of January, 2020. ■

NEWS NUDGE

Petronas names second FLNG

State-owned Malaysian oil and gas company Petronas has named its second FLNG, 'PFLNG Dua', in a ceremony in Geoje, South Korea.

The FLNG is designed to extract gas from deepwater reservoirs in depths up to 1,500 m.

With 'PFLNG Dua', Petronas now owns and operates two FLNGs, following the 'PFLNG Sat', which has been in operation since 2017.

The second PFLNG was delivered to Petronas by its partners, JGC Corp and Samsung Heavy Industries, the consortium responsible for the engineering, procurement, construction, installation and commissioning of the unit.

The 393 m long PFLNG is on schedule for completion and sail away in February, 2020, after

its construction started in 2015.

Once in service, it will be moored over the Rotan gas field, at a water depth of 1,300 m, located 140 km offshore Kota Kinabalu, Malaysia.

"The development of 'PFLNG Dua' is a step forward in providing a new supply source of clean energy and in realising our shared aspiration for a low carbon future," Tan Sri Wan Zulkiflee Wan Ariffin, Petronas President and Group CEO, said.

Qatargas in milestone Indian shipment

Qatargas has delivered the 2,000th LNG cargo to India.

It was shipped on the 155,000 cu m 'Aseem,' and was loaded at Ras Laffan on 17th November and delivered to Petronet's Dahej LNG terminal.

Qatargas had signed a 25-years long term Free On Board

(FOB) Sale and Purchase Agreement (SPA) with Petronet, loading around 116 cargoes per a year to India under the agreement in addition to supplying large volumes into the short term and spot markets.

First Yamal cargo shipped to Bangladesh

Yamal LNG has shipped the first LNG cargo to Bangladesh in accordance with the long-term off-take agreement with TOTAL.

Yamal operator NOVATEK said that the cargo was delivered via the Suez Canal through transshipment from the Arc7 'Eduard Toll' to a conventional LNGC undertaken at Zeebrugge.

The LNG cargo was unloaded at the Summit LNG Terminal in Bangladesh in accordance with the buyers lifting and delivery schedule.

"LNG demand is constantly growing all over the world with new consumer countries appear-

ing. Bangladesh started importing LNG just a year ago with the launch of the country's first LNG terminal, and it has rapidly increased natural gas consumption as well as regasification capacities," said Lev Feodosyev, NOVATEK's First Deputy Chairman of the Management Board.

Yamal LNG's Arc7 fleet complete

The last of Yamal LNG's Arc7s, 'Yakov Gakkel', was reported to be in Ob Bay in early December waiting to berth at Sabetta.

She left the Daewoo Shipbuilding and Marine Engineering (DSME) shipyard yard in early November.

With her delivery, all 15 Arc7 LNGCs are now in service.

'Yakov Gakkel' is owned and operated by Teekay.

According to NOVATEK, up to the end of November, Yamal LNG had produced 16,5 mill tonnes of LNG. ■

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

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Data last updated = Data last updated = 12th December 2019



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LNG Unlimited



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 EnergiCE	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

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