

# LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS

15 April 2021

## Atlantic LNG MOC sees record March volume

S&P Global Platts Atlantic LNG MOC saw 57 bids/offers in March - the highest monthly volume recorded thus far.

This number surpassed the last record in July, 2019, when 45 were reported by market participants.

The Atlantic LNG MOC is the price assessment process for Platts Northwest Europe, Mediterranean and Gulf Coast markers.

Of the March volume, 45 were for Northwest Europe, or North-west Europe with flexibility to North Spain, with the rest destined to the Mediterranean.

### DES Europe switch

US FOB activity was not reported, as lower freight rates and open arbitrage to Europe resulted in more companies offering DES Europe.

Atlantic traders were incen-

tivised to sell volume into Europe coming into March, as global gas and LNG spreads closed, alongside low gas stocks thus creating more demand into the UK and continental Europe.

According to Platts data, the DES Northwest Europe stood at \$6.301 per MMBtu on 31st March, up by \$1.064 per MMBtu when compared to the 26th February data.

Portfolio optimisation was also likely to have occurred on the back of the Suez Canal blockage, which could have created some short positions in need of filling.

As a result, US volume sellers preferred to offer into Europe as opposed to Asia in order to avoid sending cargoes via the Cape of

Good Hope or risking delays through the Panama Canal, both of which would add time and costs to a voyage.

In addition, a bearish shipping market allowed for increased activity, as traders looked to capitalise on cheaper DES costs.

According to Platts data, the average Atlantic daily spot LNGC charter rate stood at just over \$30,000 for March, down from an average of \$70,800 per day in February.

Some 70 cargoes were highlighted in the MOC for the first quarter of this year, making it the largest quarterly volume since the first Atlantic MOC order was reported to Platts in June, 2019.

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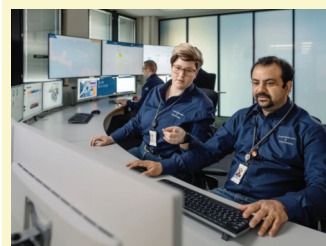
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# China still on a roll

Total seaborne imports of LNG in 2020 increased by 1.8% year-on-year to 362.2 mill tonnes, according to vessel tracking data from Refinitiv.

Whilst this still represented an increase from the 2019 figure, the growth rate was significantly slower than the 11.1% increase recorded in 2019 and the 9.6% rise seen in 2018, said Banchero Costa analysing the figures.

Last year, seaborne LNG imports to the European Union declined by 4.2% year-on-year to 62.8 mill tonnes, although it was stressed that this was still well above the volumes seen until 2019. EU imports also accounted for 17.3% of global trade.

Japan was also a disappointment in 2020, with LNG imports declining by 2.1% to 74.7 mill tonnes. Japan remained the world's top LNG importer, accounting for 20.6% of global trade volumes last year.

On the other hand, the rest of Asia performed very well. For example, Mainland China, in particular, now accounts for 18.5% of global seaborne LNG trade, and could overtake Japan to grab top

spot this year.

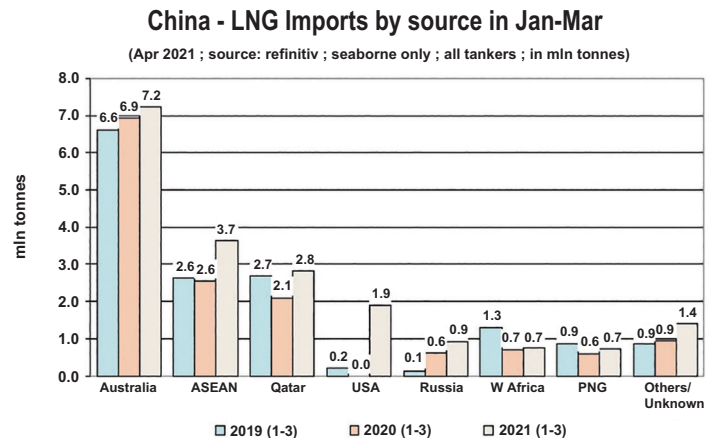
In 2020, China imported 67.2 mill tonnes of LNG, which was a 11.3% increase from the 60.4 mill tonnes recorded for 2019. In the first three months of last year, China imported just 14.4 mill tonnes of LNG, which represented a decline of 5.6%, compared with the same period of 2019.

The second quarter of 2020 was much more positive, and saw shipments as high as 16.2 mill tonnes, up 21.2%. In 3Q20, imports remained strong totalling 16.6 mill tonnes, which was up 14.6% from the same quarter in 2019.

Imports into China in 4Q20 reached a record 20 mill tonnes, which was 15.7% up from the 17.3 mill tonnes shipped in 4Q19.

## Continued momentum

At the start of this year, the momentum continued, Banchero Costa said. In 1Q21, China imported 19.4 mill tonnes of LNG, which is a 34.6% increase on the



same quarter last year.

Much of the LNG comes from Australia. With coal shipments from Australia to China stopped, due to the political dispute between the two countries, the gas trades should also have been affected.

But this does not seem to have been the case, as in 2020, Australia was the source of 44.6% of China's LNG imports, or 29.9 mill tonnes. Even in 4Q20, when coal shipments between the two countries dived, natural gas shipments held up. In the fourth quarter, Australia still accounted for 40.8% of China's LNG imports, or 10.4 mill tonnes.

Ironically, if taken from a geopolitical standpoint, the Australians were undercut by the competition from another Western ally - the US, which exported 2.1 mill tonnes of LNG to China in 4Q20, up from zero in the same period of 2019.

Something very similar happened in 1Q21. Shipments from Australia to China increased by 4.2% to 7.2 mill tonnes.

Australia's share went down to 37.3%, and again it could be argued that the main culprit was the surge in shipments from the US - 1.9 mill tonnes, up from zero in the same quarter of last year, Banchero Costa concluded. ■

## NEWS NUDGE

### Pieridae appoints new COO

Canada's Pieridae Energy, the developer of the Goldboro LNG export project, has appointed Darcy Reding as the company's new COO.

Reding succeeded Tim de Freitas who left the firm in January.

He was described as a professional engineer with 30 years of success in small and mid-sized private and public upstream oil

and gas companies, with 20 years in leadership roles.

The new COO said his focus would be to ensure the safe operations of the company's upstream natural gas infrastructure and strengthen the technical and economic readiness of the drilling inventory that provides the feedstock for the Goldboro LNG project.

Goldboro LNG in Nova Scotia will include two liquefaction facilities each with a capacity of 4.8 mill tonnes of LNG each year.

Pieridae has a 20-year binding

contract with German energy firm Uniper for the total volume from the first liquefaction train but has delayed the final investment decision (FID), which it hopes to take by the end of June.

### Golar's Ross resigns

Golar LNG's Iain Ross has tendered his resignation from the company.

The contractual termination period is six months, however the final duration can be prolonged or reduced upon mutual agreement, Golar said.

Golar LNG is currently in the final stages of closing the sale of its 50% interest in Hygo Energy Transition and 32% interest in Golar LNG Partners to New Fortress Energy (NFE) for a total of about \$5 bill.

The majority of the closing conditions have been completed, including prepayment notices issued to several of GMLPs lenders. Closing of the transactions is expected shortly, Golar said.

Golar's Board will immediately start the process to recruit Ross' successor, it said. ■

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## FSRUs on the move

There have been several FSRU contracts confirmed in the past few weeks with others on the horizon.

For example, a First Gen Corp subsidiary has agreed a five-year charter contract for a BW Gas FSRU for its Batangas offshore gas terminal project.

In a Philippines stock market filing, First Gen said the FSRU that will be provided to its wholly owned subsidiary FGEN LNG Corp will be the 162,400 cu m 'BW Paris', which has a nominal and peak gas send-out capacity of 500 mill cu ft per day and 700 mill, respectively.

The announcement comes around two weeks after FGEN LNG said it was to choose between a unit of BW Gas Ltd or Hoegh LNG Asia.

"The nominal send out capacity of the 'BW Paris' is 25% more than the production capability of Malampaya, which at its peak produced a maximum gas volume of approximately 400 MMscfd, and which is now declining," First Gen said in its regulatory filing.

'BW Paris' can also provide other services in addition to providing LNG storage and regasification, First Gen said. For example, the vessel can transfer LNG into trucks and small-scale LNGCs, which will then distribute the gas to local areas.

### Dortyol terminal change

News from Turkey is that the world's largest FSRU, owned by Japan's Mitsui OSK Lines (MOL), has left the Dortyol terminal.



The world's largest FSRU is currently on her way from Turkey to Hong Kong

She will be replaced by the new Botas-owned 170,000 cu m FSRU, 'Ertugrul Gazi', which has sailed from Hyundai Heavy Industries shipyard in South Korea.

Later this year, the 263,000 cu m 'MOL FSRU Challenger', is due start operating on a long-term contract in Hong Kong.

She will be central to Hong Kong's first LNG terminal, which is a joint venture between Castle Peak Power (CAPCO) and Hongkong Electric.

Elsewhere, India's first FSRU has arrived at H-Energy's Jaigarh Terminal in Maharashtra.

'Höegh Giant', which sailed from Keppel Shipyard, Singapore berthed at the terminal on 12th April, 2021.

The 2017-built FSRU has been chartered for 10 years and has a storage capacity of 170,000 cu m and installed regasification capacity of 750 mill cu ft per day.

H-Energy said that it intended to develop a small-scale LNG market in the region, using the FSRU for both storage and transshipment purposes.

Meanwhile, Lithuanian terminal operator Klaipėdos Nafta (KN) is in consultations to purchase an FSRU for the Klaipėda LNG terminal.

Consultation is part of KN's FSRU procurement process, which aims to familiarise market participants with the forthcoming procurement and to receive comments and remarks offering a potential solution on the submitted draft procurement documents.

The FSRU is planned to be purchased in the second half of this year.

According to a 2018 law, KN must ensure the operation of the LNG terminal until at least 2044. It also obliges KN to acquire and own the FSRU by the end of 2024.

Klaipėda LNG terminal has been operating since 2014 and the current FSRU was chartered from Höegh LNG for 10 years. This contract included a purchase option.

In order to implement the the state rules, KN said that it planned to start the FSRU's procurement process in the second half of this year. ■

## NEWS NUDGE

### Excelerate hits 2,000 STS

Excelerate Energy completed its 2,000th commercial ship-to-ship (STS) LNG transfer on 3rd April, 2021.

The transfer occurred at Excelerate's Moheshkhali floating LNG (MLNG) terminal located offshore Bangladesh in the Bay of Bengal.

Using Excelerate's FSRU 'Excellence' and a conventional LNGC, 144,191 cu m of LNG were transferred using the double-banked LNG transfer system.

To date, Excelerate has transferred over 236,405,000 cu m of LNG using this STS protocol, the company claimed.

Excelerate conducted the industry's first commercial STS transfer of LNG in 2007. Since then, STS transfers have been commercially accepted and proven in a wide range of environments, including open ocean and protected bodies of water at various locations between the LNG load ports and market delivery points.

The company has imported over 157 cargoes of LNG and delivered an excess of 500 mill MMBtu of natural gas into the Bangladeshi market to date.

Last month, the country reached its highest level of gas output with around 837 mill cu ft per day of natural gas as the government continued to increase its LNG imports to meet the rising domestic demand. ■

## Ioannis (John) Angelicoussis

It is with deep regret that we have to report the passing of Ioannis (John) Angelicoussis.

Down the years, he had built a formidable shipping group of which he was President.

His daughter Maria will now assume the Presidency of the Angelicoussis empire.

He was born in London in 1948. In 1989, he took over the shipping conglomerate following the death of his father.

Down the years he built up the group to become one of the largest Greek shipowners. At the time of his death, the group owned 139 ships with another 15 newbuildings.

Angelicoussis is involved in most shipping sectors - drybulk, tankers and LNGCs, through Maran Gas.

In a statement, Greek Prime Minister, Kyriakos Mitsotakis, said; "The world's shipowning community has lost one of its leaders and the Greek maritime nation is mourning its greatest Captain.

"Ioannis Angelicoussis honoured our country's maritime tradition in every way possible. He conquered the oceans, raising the Greek flag

in his ships. He relocated his businesses' base in Greece and supported its maritime training. And he also helped in our country's health system battle against the pandemic with silent donations.

"In these difficult moments, my thoughts are with the family and his closest people," Mitsotakis concluded. ■

# Eni and Zhejiang to co-operate on LNG projects

At the end of last month, Italian energy giant Eni signed a Memorandum of Understanding (MoU) with Zhejiang Energy to co-operate in the energy sector.

A co-operation framework was established aimed at facilitating joint initiatives between the two companies across the gas and LNG value chain in China and elsewhere.

Eni said that the MoU builds on the shared goal of promoting

emissions reduction by favouring a switch from coal to gas for electricity production. The initiatives thus far identified range from developing long term LNG supply agreements to joint participation in gas/LNG projects.

For Eni, the MoU represents

a further step in its energy transition process having recently launched a new strategy, which aims at the company becoming carbon neutral by 2050, in all its operations, processes and products.

In the long term, gas - which

will be increasingly de-carbonised - will represent more than 90% of Eni's production, the company said.

Eni has been present in China since 1984 and has recently established a representative office in Beijing. ■

# Investor snaps up part of Sempra Infrastructure Partners

Sempra Energy has agreed to sell a non-controlling, 20% interest in Sempra Infrastructure Partners, to investment firm KKR for \$3.37 bill in cash.

This transaction values Sempra Infrastructure Partners at around \$25.2 bill, including expected asset-related debt at the closing of \$8.37 bill.

Sempra said that this announcement is part of a series of integrated transactions originally announced in December, 2020 that are intended to simplify its non-utility infrastructure investments under one self-funding platform.

In addition, this will combine the strengths of Sempra LNG and IEnova, a Mexican private energy company and a leading developer and operator of renewables and natural gas infrastructure in the country.

"Over the next decade, we expect the energy markets in North America to continue to grow and become increasingly integrated. Combining our resources with KKR improves our ability to capture new investment opportunities in cleaner forms of energy and the critical infrastructure that stores and transports it," explained Jeffrey Martin, Sempra Energy Chairman and CEO. "This transaction also sends a clear signal about the value and expected growth of our infrastructure portfolio."

"Investing in critical new energy infrastructure creates jobs, delivers reliable energy with

fewer emissions and supports North America's economic recovery," added Raj Agrawal, KKR Partner and Global Head of Infrastructure. "That is why we are excited to partner with Sempra Energy."

"This infrastructure platform provides a strong foundation to expand cleaner energy resources across the continent. Backed by strong, contractually-supported, long-term cash flows, our investment is also consistent with KKR Infrastructure's strategy to seek stable and predictable returns for our investors," he said.

KKR will make the investment through its Global Infrastructure Investors Funds. The company first established its Global Infrastructure strategy in 2008 and has since been an active infrastructure investor with a team of more than 50 dedicated investment professionals.

The firm currently has over \$27 bill in infrastructure assets under management and has made over 40 infrastructure investments across a range of sub-sectors and geographies.

## Mid-2021 closure

The transaction is expected to be completed by mid-2021, subject to customary closing conditions,



Sempra Energy's CEO Jeffrey Martin

including consents from certain third parties and regulators.

Sempra Infrastructure Partners owns, among other assets:

- An LNG portfolio consisting of up to 45 mill tonnes per annum of LNG export capacity in development, construction or operation on the North American Pacific and Gulf Coasts.
- A renewable portfolio consisting of up to 4 GW of renewable energy generation in development, construction or operation in Mexico and related electric transmission infrastructure.
- A natural gas infrastructure portfolio consisting of distribution companies and certain cross-border and in-country pipelines, including those that export US natural gas to Mexico and supply the Energía Costa

Azul LNG facility.

Also, in December 2020, Sempra Energy announced its intention to launch a stock-for-stock exchange offer for the publicly-traded shares of IEnova, with Sempra Energy's common shares to be listed on the Mexican stock exchange (Bolsa Mexicana de Valores, SAB de CV). Sempra Energy intends to commence this exchange offer following approval by the US and Mexican regulatory authorities.

Goldman Sachs & Co is serving as financial advisor and White & Case is serving as legal advisor to Sempra Energy. Credit Suisse Securities (USA) and Mizuho Securities USA are serving as financial advisors and Simpson Thacher & Bartlett and Creel, García-Cuellar, Aiza y Enríquez, are serving as KKR's legal advisors. ■

## More cargo agreements reported

One of Sinopec's trading arms, Unipet, recently purchased over 40 LNG cargoes in a strip tender.

The cargoes are for delivery between June, 2021 and February, 2022, sources told S&P Global Platts.

The tender closed on 6th April and was valid until the following day. JKM-linked offers were preferred, while Brent-linked, TTF-linked and fixed price offers were also acceptable, according to the sources.

Market sources said that around 40-50 cargoes were awarded, about five to six cargoes per month. At least 30 cargoes were awarded on a JKM-linked basis, less than 10 on Brent-linked and a couple on TTF-linked and fixed price basis.

Most cargoes awarded for the third of fourth quarter of this year were at a discount to the monthly JKM averages, with greater discounts given for the third quarter.

Companies involved included BP, Vitol, Litasco, Gunvor, RWE, Mitsui, SixOne, Shell, Qatar Petroleum, Gazprom and Glencore, according to trading sources. The first five sold at least five cargoes to Sinopec.

This strip tender signalled the start of the gas injection period into the underground gas storage Wen 23, with a working capacity

of 10 bill cu m, which typically begins in June each year, the sources told Platts.

They also thought that the Chinese could be looking to secure volume for the winter period in advance.

Elsewhere, Chevron USA Inc (Singapore Branch) (CUSA) has signed a binding Sale and Purchase Agreement (SPA) with Japan's Hokkaido Gas for the delivery of LNG.

The LNG will be delivered from Chevron's global LNG portfolio to the Hokkaido area.

Under the agreement, CUSA will supply Hokkaido Gas with about a 500,000 tonnes of LNG for five years starting April, 2022.

Hokkaido Gas is an integrated energy company located in Sapporo, Japan, which provides city gas, electricity and other energy services in Hokkaido region.

### ENN 10-year tender

ENN LNG (Singapore) Pte Ltd, a unit of private Chinese gas distributor ENN Group, has issued a tender for LNG imports for 10 years starting in 2022.

In what is claimed to be the firm's largest long-term tender, ENN LNG sought between 500,000 and 1 mill tonnes of LNG per year,

with prices benchmarked over Brent oil on a China-delivered basis, sources told Reuters.

ENN was the first private Chinese firm to own and operate a major LNG receiving terminal, which is located in Zhoushan in eastern China's Zhejiang province, just south of Shanghai.

This terminal can handle up to 5 mill tonnes of LNG per year, up from an initial designed receiving capacity of 3 mill tonnes.

Argentina is to more than double its spot market LNG purchases this winter, in a bid to avoid a deficit, local sources said.

Imports into Bahía Blanca were suspended in 2018, in the hope of being able to cover any deficit using domestic shale gas, but imports are planned to resume next month.

State-run Integración Energética Argentina (IEASA) has issued a tender seeking 13 shipments for delivery between May and August to Bahía Blanca, where a new FSRU will be berthed for almost 100 days from the end of May.

The company had already purchased 24 part loads for delivery during the same period to its other FSRU moored on the Paraná river. ■

## OLT Toscana's small scale LNG service goes live

OLT Offshore LNG Toscana's expression of interest for its new small scale service has been published on its website.

OLT will be the first Italian regasification terminal to provide LNG discharge into small scale LNGCs, the LNG terminal operator claimed and will complete the LNG supply chain.

Through the expression of interest, stakeholders will be able to present their proposals regarding the new service offered.

Users can provide:

- The interested annual capacity, expressed in number of small scale LNGCs per year that they expect to book.
- Small scale service tariff expectation.
- Any small scale LNGC expected to be used.
- Other information deemed useful for this service.

The expressions of interest are confidential, not binding, and will need to be sent by 17th May, 2021 to: [SSLNG@oltoffshore.it](mailto:SSLNG@oltoffshore.it) ■

## Law firm helps Sembcorp win LNG import contract

King & Wood Mallesons (KWM) has advised Sembcorp Fuels (Singapore) (Sembcorp) on its successful proposal to the Singapore Energy Market Authority (EMA) to be appointed LNG importer for the island.

EMA undertook a competitive request for proposal process to select two new LNG importers, to take the number of term LNG importers in Singapore up to four.

Proposals submitted by Sembcorp and Exxon Mobil LNG Asia Pacific (ExxonMobil) were the most competitive proposals received, the EMA said.

Thus, Sembcorp and ExxonMobil join Pavilion Energy and Shell

Eastern Trading as Singapore's four licensed long term LNG importers.

This will enable Sembcorp to import LNG on a term basis and sell regasified LNG to Singapore market customers, augmenting its existing portfolio, which now includes LNG, piped natural gas, biomass, waste and solar.

Lead KWM special counsel on the project, David Phua, said: "We are delighted to have assisted an

important client and participant in the Singapore and regional energy sector, Sembcorp, on this milestone achievement.

"Sembcorp's appointment as a term LNG importer for Singapore followed an extremely competitive proposal process and solidifies its position in the region's energy market.

"By leveraging our deep experience and knowledge of Singapore's

LNG and gas market, we helped Sembcorp negotiate its upstream sale and purchase agreement for the purchase of LNG to be imported as licensee and pull together a winning proposal," he added.

KWM claimed a strong track record of work for Asia's leading LNG sector participants, from and in jurisdictions, including Singapore, China, Australia, Japan, Bangladesh and Vietnam. ■

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# NOVATEK plans to raise more cash

Russian gas company NOVATEK aims to raise \$11 bill in financing for the Arctic LNG 2 project in an equal split between domestic and Asian banks.

This is on top of \$10 bill to be raised by the project's shareholders, the Russian business daily Kommersant reported, translated by the Barents Observer media outlet.

This would bring the project's

total cost up to \$21.3 bill.

According to the article, the syndicate banks ready to provide loans for 51.6% of the total cost of Arctic LNG 2 includes many of the same banks that financed the company's Yamal project.



NOVATEK to raise more cash for Arctic LNG 2

The Russian banks, VEB.RF, Sberbank and Gazprombank will cover half and a pool of foreign banks, consisting of China Development Bank (CDB), the Export-Import Bank of China, the Bank of Japan for International Co-operation (JBIC), Intesa Sanpaolo and Raiffeisen Bank International will cover the other half.

Earlier in March, NOVATEK CEO Leonid Mikhelson told state-affiliated news agency TASS that investments for the project were not negatively affected by the pandemic.

The first of three trains is scheduled to be operational in 2023, the second in 2024 and the third in 2026. They will each have an annual capacity of 6.6 mill tonnes.

Six module-based units (GBS) for LNG production are currently under construction at the Wison

Offshore & Marine's Zhoushan yard in China.

Other huge constructions for the plant, including assembling and installation of topside modules, will take place at Belokamenka north of Murmansk at which NOVATEK is building the Kola yard with two huge drydocks and other facilities to serve the company's Arctic development projects.

According to a recent Russian government programme aimed to boost LNG production in the country's Arctic regions, the goal is to deliver 140 mill tonnes by 2035, almost five times the 2020 production figure, the Barents Observer said.

More than 90% of Russia's natural gas resources are in the Yamal-Nenets region in which NOVATEK has its current production facility at Sabetta.

# Wavespec splits from Braemar

Braemar has completed the sale of its gas specialist business Wavespec to a new entity, Wavespec Holding BV, for £2.635 mill.

Wavespec was the Group's engineering division and its disposal is in line with its new strategy centred on its core shipbroking business.

The engineering concern provides consultancy services and solutions to the gas processing, LNG and marine industries.

For the year to 29th February, 2020, Wavespec generated revenue of £3.1 mill and reported an underlying operating loss of £1.4 mill.

Wavespec will be treated as a discontinued operation for Braemar's year ended 28th February, 2021 and the total reported loss is estimated to be around £2.4 mill made up of a trading loss of £1.7 mill and an estimated loss on disposal of £0.7 mill.

Its gross assets, as at the last

reported balance sheet dated 31st August, 2020 were £0.5 mill.

The £2.635 mill fee was backed by the issuing of a promissory note with a maturity date of 31st March, 2026, which is currently expected to be retained by the company.

The sale agreement contains an obligation for the buyer to secure the note by providing a standby letter of credit issued by an international bank with an acceptable credit rating.

Should the new owner fail to deliver a letter of credit, Braemar can elect to receive £0.5 mill cash from the buyer with the balance of the note remaining unsecured.

This disposal is being structured as the sale of 100% of the shares in three separate legal en-

ties from within the Group - Braemar Wavespec Limited, Braemar Wavespec Inc and Braemar LNG BV.

Wavespec Holding is backed by Cosmos SICAV, an investment fund managed by Abalone Asset Management.

The company is led by a management team comprising Sheila McClain, Managing Partner, Constantyn Gieskes, Partner - LNG & Renewables, and Andy Bright, Partner - Marine Shipping Projects.

McClain said: "We are delighted to announce this change in ownership, which is in line with our strategy of growing a more diverse technical consulting business.

"Going private with more access to the funds we need to expand the business will allow us to



Sheila McClain has overseen the split from Braemar

sustain current operations and grow with the demands of our clients' changing needs. It represents the next chapter for our brand, while we maintain the existing services that we've provided our clientele for the past 28 years," she said.

## Wärtsilä wins LNGC support contracts

Wärtsilä has signed an optimised maintenance agreement with Nippon Yusen Kaisha (NYK) and Monohakobi Technology Institute (MTI) to evaluate Wärtsilä's Expert Insight predictive maintenance service as part of a pilot programme.

This programme could lead to NYK adopting the solution throughout its entire fleet.

The evaluation will be carried out on two LNGCs, 'Marvel Falcon' and 'LNG Sakura'. Both vessels are fitted with Wärtsilä dual-fuel engines.

Analytics and support service provided by Expert Insight will be evaluated, in combination with the Wärtsilä optimised maintenance lifecycle solution.

Expert Insight is a service that leverages artificial intelligence (AI) and advanced diagnostics to monitor equipment and systems in real-time, spot anomalies, foresee potential problems, and enable rapid reaction accordingly.

### Pro-active support

Should anomalous behaviour be detected, it is flagged to specialists at Wärtsilä Expertise Centres, allowing them to support the customer pro-actively with an appropriate resolution to any issue.

The combination of AI, advanced diagnostics, and the company's

extensive equipment expertise greatly enhances the reliability, efficiency, and safety of the installed equipment, the company claimed.

"NYK has already commenced operating an expert-in-the loop service at our remote diagnostics centre in Manila.

"This anomaly detection system oversees the entire engine plant, and we are confident that the complementing expertise from both our companies will result in the best possible support for our vessels. By leveraging big data and artificial intelligence, the maritime industry can greatly increase its efficiency, safety, and competitiveness, and we are keen to take advantage of this wherever possible.

"We are excited at the possibilities provided by Wärtsilä's Expert Insight and look forward to the results from this programme," said Shogo Yamada, Manager, Marine Group, NYK Line.

"When we introduced Expert Insight as part of the Optimised Maintenance programme, it was pointed out that it takes predictive



A Wärtsilä Expertise Centre

maintenance to the next level. This is rapidly proving to be the case, and we are happy to co-operate with NYK/MTI in demonstrating the commercial value and benefits the system offers to them by delivering greater vessel uptime, less unscheduled maintenance, and lower operating costs while optimising their ships' performance," added Tateo Miyagawa, Managing Director, Wärtsilä Japan.

In addition, last month, Wärtsilä signed long-term optimised

maintenance agreements covering five LNGCs owned and operated by Greece-based Minerva Gas.

These vessels will also receive the Expert Insight service.

LNGCs covered by the agreements are 'Minerva Kalymnos', 'Minerva Chios' and 'Minerva Amorgos', which are powered by low pressure, WinGD X-DF 2-stroke, dual-fuel main engines, and 'Minerva Psara' and 'Minerva Limnos', which operate with Wärtsilä 34DF 4-stroke dual-fuel auxiliary engines. ■

## For Connect LNG read ECONNECT Energy

Norwegian technology provider of jettiless solutions for marine loading and bunkering Connect LNG, has re-branded itself as ECONNECT Energy.

This move was made to better reflect a broader focus on clean energy transfer solutions, the company said.

"The new focus aims to make clean energy accessible globally to realise solutions for not just LNG, but also renewable fuels and the carbon-capture value chain," said the Oslo-based company.

Connect LNG was founded in 2012 based on the belief that

clean energy should be accessible and affordable.

The Connect LNG floating jettiless system, the IQuay (previously named the UTS), can also be used for carbon capture and storage (CCS) and renewable fuels such as ammonia, bio LNG and hydrogen.

The first the IQuay called "La Santa Maria" was used in Norway in February 2019 for an operation

involving Norwegian state-backed energy company Equinor and Naturgy Group, the Spanish utility and participant in the LNG market with global supplies, also now including US and Russian volumes.

The successful operation took place offshore Langesund in Norway, an area renowned for harsh weather during winter time.

The new ECONNECT company will leverage its experience in the LNG energy market to enable a seamless transition into new, carbon-free area.

It explained that with a focus now switched to include the potential of renewable energies, a

new name was required to align with the company's ambitions.

"A passion for change and a desire to challenge 'common practice' are in the company's DNA," said ECONNECT CEO, Morten Christophersen.

"When we designed our transfer solution we always wanted to apply it to more than just LNG.

"With our current focus and success in the LNG market coupled with experience with CCS and renewables, we are well-positioned to broaden our scope to include new, carbon-free energy solutions," Christophersen concluded. ■

“When we designed our transfer solution we always wanted to apply it to more than just LNG

- ECONNECT Chief Executive Morten Christophersen

## GTT's digital solution for tank maintenance

GTT has obtained an Approval in Principle (AiP) from Bureau Veritas (BV).

The AiP is related to the use of a digital solution for sloshing activity assessment in class surveys in order to optimise the LNG membrane tank maintenance frequency.

This digital solution is based on GTT's 'Sloshing Virtual Sensor' technology, using its tank digital twin and real-time FSRU, FLNG and LNGC operational data to monitor the critical parameters with regards to tank integrity.

Combined with an appropriate risk analysis, the solution can support alternative survey plans aimed at optimising tank maintenance, while complying with strict safety standards. This will translate into increased operational flexibility and substantial cost saving for shipowners, GTT claimed.

Philippe Berterottière, GTT Chairman and CEO, said: "Artificial intelligence, combined with the expertise of GTT's teams, has made it possible to develop a unique digital solution to optimise the frequency of tank maintenance, while guaranteeing the highest safety standard.

"With this new cutting-edge digital solution, GTT is putting

its innovation and technological knowhow at the service of shipowners, in order to help them adapt to an increasingly demanding commercial environment," he said.

Matthieu de Tugny, BV's Executive Vice President Marine & Offshore, added: "Digitalisation, combined with artificial intelligence, is a major transformation for the shipping industry bringing new challenges and opportunities.

"I am proud Bureau Veritas helped GTT to pioneer this digital solution for sloshing activity assessment in the framework of class survey (using sloshing model tests, real-time operational data and machine learning) with the highest safety standards.

"This demonstrates not only our technical expertise in the fields of sloshing for gas carriers but also our strong competencies in digitalisation and artificial intelligence. Our role remains more than ever to help the industry understand - and address - both risk and opportunity as we look into future technologies," he said.

In addition, GTT has announced that it had received an order from Hyundai Heavy Industries (HHI) for the tank design of two VLECs on behalf of an Asian shipowner.

As part of the order, GTT will design the VLECs' 98,000 cu m tanks. They will be fitted with the GTT Mark III membrane containment system.

The vessels will be delivered in the last quarter of 2022 and the first quarter of 2023.

VLECs are versatile, as they are designed for multi-gas use - ethane, LPG, Ethylene - while still being able to carry LNG, GTT said.

### New order

The company also announced another order this week from Hudong-Zhonghua Shipbuilding for the tank design of a new LNGC on behalf of the Chinese shipowner ShenZhen Gas Corp.

GTT will design the tanks of the 79,960 cu m vessel, which will be fitted with the NO96 L03+ membrane containment system.

She is due to be delivered in January, 2023. ■

## ecoSMRT reaches 50 not out

LNG solutions provider, Babcock's LGE, has won a further five supply contracts for its patented LNG boil-off gas (BOG) reliquefaction technology, ecoSMRT.

This will bring the total supplied to 50 in less than three years.

The latest ecoSMRTs will be fitted on board LNGCs under construction at Hyundai Heavy Industries (HHI).

Four of the five LNGCs are being built for charter to Shell Tankers (Singapore) and will be delivered from 2022 to different shipowners, bringing the number of Shell-chartered vessels fitted to over 20.

Another order was placed with Sovcomflot for its latest LNGC newbuilding at HHI. This order marked the 50th contract win for ecoSMRT.

Developed to combat inefficiencies in existing BOG reliquefaction systems, Babcock claimed that ecoSMRT has a proven track record with 12 systems in service by the end of last month.

Neale Campbell, Babcock LGE, Managing Director, said: "We are delighted to have secured these latest contracts at Hyundai Heavy Industries and to be providing our innovative technology again to Shell and Sovcomflot, both of whom have multiple ecoSMRT units in operation or on order.

"There are many benefits of the ecoSMRT system; 30% increased efficiency versus competing systems, market-leading reliquefaction capability and low maintenance requirements. ecoSMRT is an important technology for today's modern LNG carriers," he said.

With each system capable of reducing CO2 emissions by up to 19,000 tonnes per year, ecoSMRT also plays an important role in managing LNGC emissions. The system maximises vessels' operating lifecycle and supports the marine industry's transition towards a net-zero future, the company said. ■

## NEWS NUDGE

### LNGC deliveries, etc

Several LNGCs were reported delivered recently, including two for TMS Cardiff Gas and one for BW LNG.

The TMS Cardiff vessels were the 174,000 cu m 'LNGShips Athena', which sailed from Hyundai Heavy Industry's Ulsan shipyard, while the similar capacity 'LNGShips Empress' left Samsung Heavy Industry's Geoje shipyard.

Both LNGCs are term chartered to Shell, together with the sistership 'LNGShips Manhattan', which is due to be delivered later this month from HHI.

BW LNG's delivery, 'BW Lesmes' is chartered to BP.

Elsewhere, the 170,000 cu m FSRU 'Ertugrul Gazi' was also delivered in March to Turkey's

state-run gas supplier Botas (see page 3).

Later it was also reported that Latsco Shipping, a unit of the Latis Group, had taken delivery of its first LNGC, the 174,000 cu m 'Hellas Diana' from Hyundai Samho Heavy Industries.

Latsco ordered two X-DF sisterships via Consolidated Marine Management at the shipyard in November, 2018.

Commodity trader Trafigura has chartered both vessels, according to VesselsValue data.

The second vessel 'Hellas Athina' is due for delivery later this year.

France LNG Shipping, a joint venture between NYK and Geogas LNG, has taken delivery of the 174,000 cu m 'LNG Adventure', which has gone on charter with Total Gas & Power.

She features a WinGD X-DF engine and was delivered on

31st March from Samsung Heavy Industries.

The LNGC will be operated by Marseille-based shipmanager, Gazocean, which became an NYK subsidiary last October.

Another company to receive its first LNGC recently was Danish investment firm Navigare Capital Partners.

The 174,000 cu m 'Marvel Swan' was delivered by Samsung and will go on charter to Japan's trading house Mitsui & Co to ship Mitsui's offtake volumes from Sempra's Cameron LNG plant in Louisiana.

She is managed by Pronav, part of the Schulte Group, and is one of eight LNGCs chartered by Mitsui.

Brokers have reported that the 1984-built, 132,588 cu m LNGC 'Atlantic Energy' arrived at Chat-togram for recycling on 8th April.

She had been laid up near Labuan for several months. ■

# LNG Solutions for the Marine Industry



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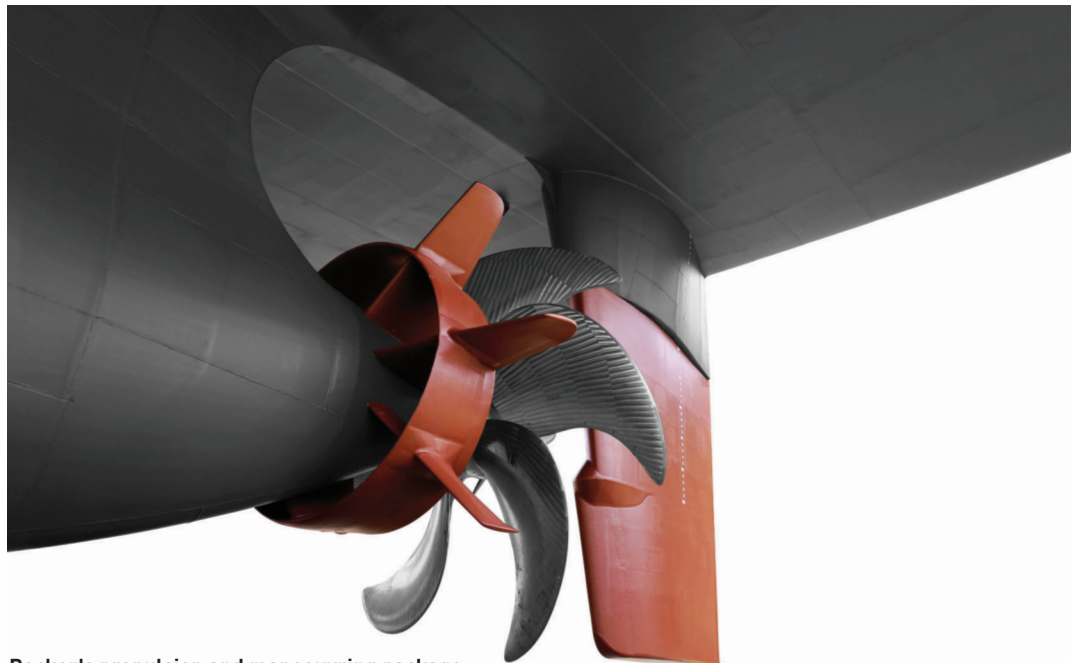
## Nakashima Propeller takes majority stake in Becker Marine

The Japanese propeller manufacturer Nakashima Propeller has bought a majority stake in Hamburg-based Becker Marine Systems (BMS).

This move follows decades of co-operation between the two companies. Their combined product portfolio creates a strong hydrodynamic system provider for propulsion and manoeuvring of ships of all sizes aimed at shipyards and shipping companies worldwide.

Although keeping their separate identities, Nakashima Propeller and BMS will be working even more closely together to make good use of the product portfolios that complement each other in the aft ship area - Nakashima as a world market leader for propellers and BMS as a manufacturer of high-efficiency rudders and energy-saving devices.

"We have gotten to know Nakashima Propeller as a much respected and reliable partner through decades of co-operation," said BMS joint Managing Directors, Dirk Lehmann and Henning Kuhlmann, "and because we are expert suppliers in the area in front of and behind the propeller



Becker's propulsion and manoeuvring package

with well-known products such as the Becker Mewis Duct and the Becker Rudder family, the co-operation with the globally leading propeller manufacturer is, of course, a perfect fit."

Both family companies will aim at the newbuilding and retrofit sectors. One area being looked at is an optimised propulsion and manoeuvring package for changing requirements for LNGCs, Lehmann said.

Both companies have computa-

tional fluid dynamics (CFD) departments, which will be used even more efficiently together.

"Becker and Nakashima have been co-operating since 1978. This time, we are pleased to enhance the strategic partnership with Becker Marine Systems through this agreement. I strongly believe that the relationship and trust which both families and management teams built over 40 years enables us to reach this agreement successfully.

"We will make a significant contribution to total optimisation for propulsive performance as well as manoeuvring performance to our customers during entire lifecycle of ships," said Nakashima's President, Takayoshi Nakashima.

Both companies will target South Korea, as Nakashima already has agreements with Imabari and JMU shipyards, as well as with Japanese shipowners, while BMS manufactures equipment in China.

### Monthly Large LNGC Values\*

|                               |               |
|-------------------------------|---------------|
| Newbuildings (174,000 cu m)   | \$184.66 mill |
| Five years old (160,000 cu m) | \$141.19 mill |
| Total Fleet (511 ships)       | \$55.21 bill  |
| Orderbook (130 ships)         | \$24.84 bill  |

Source: VesselsValue (30/03/21)

\*The above is updated each month courtesy of VesselsValue

### LNG rate assessments

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

| Region       | This week | Change*   |
|--------------|-----------|-----------|
| East of Suez | \$40,000  | +\$10,000 |
| West of Suez | \$53,000  | +\$21,000 |
| 12 mos T/C   | \$61,000  | +\$8,000  |

\*Since last report (01/04/21)

Source: Fearnleys (14/04/21)



## 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  | Tripura              | 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  | Green 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          |

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 = 3rd February 2021

| 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  | 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  | Bunker Breeze            | 0      | LNG          | Barcelona                | Yes               | Suardiaz Energy Shipping    |
| 2019  | SM Jeju LNG1             | 7,500  | LNG          | Korea                    | Yes               | Korea Line                  |
| 2019  | Gas Agility              | 18,600 | LNG          | NWE                      | Yes               | MOL                         |
| 2019  | Flexfueller 001          | 1,480  | LNG          | Amsterdam                | Yes               | Titan LNG                   |
| 2020  | Avenir Advantage         | 7,500  | LNG          | Mediterranean            | Yes               | Stolt-Nielsen Gas           |
| 2020  | Avenir Accolade          | 7,500  | LNG          | Mediterranean            | Yes               | Stolt-Nielsen Gas           |
| 2020  | SM Jeju LNG2             | 7,500  | LNG          | Korea                    | Yes               | Korea Line                  |
| 2020  | CNTIC VPOWER Global      | 28,000 | LNG          | Myanmar                  | Yes               | Dalian Inteh Group          |
| 2020  | Q-LNG 4000               | 4,000  | LNG          | US Coast                 | Yes               | Q-LNG Transport/Harvey Gulf |
| 2020  | Avenir Aspiration        | 7,500  | LNG          |                          | Yes               | Stolt-Nielsen Gas           |
| 2020  | FueLNG Bellina           | 7,500  | LNG          | Singapore                | Yes               | FueLNG                      |
| 2020  | Kaguya                   | 3,500  | LNG          | Japan                    | Yes               | CLS                         |
| 2020  | Optimus                  | 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                   |
| 2020  | Ecobunker Tokyo Bay      | 2,500  | LMG          | Japan                    | Yes               | Ecobunkers                  |
| 2021  | Stolt TBN (option)       | 7,500  | LNG          |                          | Yes               | Stolt-Nielsen Gas           |
| 2021  | Knutsen TBN              | 30,000 | LNG          | Mediterranean            | Yes               | Knutsen OAS                 |
| 2021  | Dmitry Mendelev          | 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                         |
| 2021  | TBN                      | 18,600 | LNG          | Mediterranean            | Yes               | MOL                         |
| 2021  | TG TBN                   | 500    | LNG          | Korea                    | Yes               | Trans Gas                   |
| 2022  | Stolt TBN                | 20,000 | LNG          | Worldwide                | Yes               | Stolt-Nielsen Gas           |
| 2022  | Stolt TBN                | 20,000 | LNG          | Worldwide                | Yes               | Stolt-Nielsen Gas           |
| 2022  | Clean Cañaveral          | 5,400  | LNG          | USG                      | Yes               | PNE                         |
| 2023  | Cryopeak TBA             | 4,000  | LNG          | West Canada              | Yes               | Cryopeak                    |
| 2022  | Knutsen TBN              | 5,000  | LNG          | Spain                    | Yes               | Knutsen OAS                 |
| 2023  | Knutsen TBN              | 12,500 | LNG          | Spain                    | Yes               | Knutsen OAS                 |
| 2024  | Stolt TBN (option)       | 20,000 | LNG          | Worldwide                | Yes               | Stolt-Nielsen Gas           |
| 2024  | Stolt TBN (option)       | 20,000 | LNG          | Worldwide                | Yes               | Stolt-Nielsen Gas           |
| 2026  | Stolt TBN (option)       | 20,000 | LNG          | Worldwide                | Yes               | Stolt-Nielsen Gas           |
| 2026  | Stolt TBN (option)       | 20,000 | LNG          | Worldwide                | Yes               | Stolt-Nielsen Gas           |

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

\*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less  
TBN = To Be Nominated indicates ships are still at construction/planning stage

\*\* = project shelved † = Data to be verified Data last updated = 3rd February 2021

## WORLD LNG CARRIER ORDERBOOK

| Name                 | Containment system | Propulsion | Yard            | Delivery date | Capacity | Primary Owner            |
|----------------------|--------------------|------------|-----------------|---------------|----------|--------------------------|
| Bw Lesmes            | GTT 96 GW          | MEGI       | DSME            | 01/03/2021    | 174000   | BWGas                    |
| Marvel Swan          | Unknown            | XDF        | Samsung         | 01/03/2021    | 173400   | Navigare                 |
| Lngships Empress     | GTT MK III Flex    | XDF        | Samsung         | 01/03/2021    | 174000   | TMS Cardiff Gas          |
| Hellas Diana         | GTT MK III Flex    | XDF        | Hyundai         | 01/03/2021    | 174000   | Latsco Shipping          |
| Lngships Athena      | GTT MK III Flex    | XDF        | Hyundai         | 01/03/2021    | 174000   | TMS Cardiff Gas          |
| Lng Adventure        | GTT MK III Flex    | XDF        | Samsung         | 01/03/2021    | 174000   | NYK                      |
| Lngship Manhattan    | GTT MK III Flex    | XDF        | Hyundai         | 01/04/2021    | 174000   | TMS Cardiff Gas          |
| Celsius Charlotte    | Unknown            | XDF        | Samsung         | 01/05/2021    | 180000   | Celsius Shipping         |
| Diamond Gas Crystal  | GTT MK III Flex    | XDF        | Hyundai         | 01/05/2021    | 174000   | NYK                      |
| Flex Vigilant        | GTT MK III Flex    | XDF        | Hyundai         | 01/05/2021    | 174000   | Flex LNG                 |
| Energy Integrity     | GTT 96 GW          | MEGI       | DSME            | 01/05/2021    | 173400   | Alpha Gas                |
| Yiannis              | GTT 96 GW          | MEGI       | DSME            | 01/06/2021    | 174000   | Maran Gas Maritime       |
| Mu Lan               | GTT 96 L03+        | XDF        | Hudong-Zhonghua | 01/06/2021    | 174000   | CSSC                     |
| Bw Helios            | GTT 96 GW          | MEGI       | DSME            | 01/06/2021    | 174000   | BWGas                    |
| Energy Intelligence  | GTT 96 GW          | MEGI       | DSME            | 01/06/2021    | 174000   | Alpha Gas                |
| Gaslog Wellington    | GTT MK III Flex+   | XDF        | Samsung         | 01/06/2021    | 180000   | GasLog                   |
| Isabella             | GTT 96 GW          | XDF        | DSME            | 01/06/2021    | 174000   | Maran Gas Maritime       |
| Aristarchos          | GTT MK III Flex    | XDF        | Hyundai         | 01/06/2021    | 174000   | Capital Gas              |
| Mol Hestia           | Unknown            | MEGI       | DSME            | 01/07/2021    | 174000   | MOL                      |
| Minerva Chios        | GTT MK III Flex+   | XDF        | Samsung         | 01/07/2021    | 174000   | Minerva Marine           |
| Minerva Limnos       | GTT 96 GW          | MEGI       | DSME            | 01/07/2021    | 173400   | Minerva Marine           |
| Adamastos            | GTT MK III Flex    | XDF        | Hyundai         | 01/08/2021    | 174000   | Capital Gas              |
| Samsung 2314         | Unknown            | XDF        | Samsung         | 01/08/2021    | 180000   | Celsius Shipping         |
| Gaslog Winchester    | GTT MK III Flex+   | XDF        | Samsung         | 01/08/2021    | 180000   | GasLog                   |
| Attalos              | GTT MK III Flex    | XDF        | Hyundai         | 01/08/2021    | 174000   | Capital Gas              |
| Asklipios            | GTT MK III Flex    | XDF        | Hyundai         | 01/09/2021    | 174000   | Capital Gas              |
| Daewoo 2504          | GTT 96             | XDF        | DSME            | 01/09/2021    | 174000   | Maran Gas Maritime       |
| Global Sea Spirit    | GTT 96 GW          | XDF        | DSME            | 01/09/2021    | 173400   | Nakilat                  |
| Samsung 2306         | GTT MK III Flex    | XDF        | Samsung         | 01/09/2021    | 174000   | NYK                      |
| Diamond Gas Victoria | GTT MK III Flex    | XDF        | Hyundai         | 01/09/2021    | 174000   | NYK                      |
| Hellas Athina        | GTT MK III Flex    | XDF        | Hyundai         | 01/09/2021    | 174000   | Latsco Shipping          |
| Samsung 2355         | GTT MK III Flex    | XDF        | Samsung         | 01/10/2021    | 174000   | NYK                      |
| Daewoo 2507          | GTT 96 GW          | XDF        | DSME            | 01/10/2021    | 174000   | Maran Gas Maritime       |
| Hyundai Ulsan 2939   | GTT MK III Flex    | XDF        | Hyundai         | 01/10/2021    | 180000   | SK Shipping              |
| Daewoo 2506          | GTT 96             | MEGI       | DSME            | 01/11/2021    | 174000   | Maran Gas Maritime       |
| Hyundai Samho 8025   |                    | XDF        | Hyundai         | 01/12/2021    | 174000   | H-Line                   |
| Tenergy              | GTT MK III Flex    | XDF        | Hyundai         | 01/12/2021    | 174000   | Tsakos Energy Navigation |
| Samsung 2336         | GTT MK III Flex    | XDF        | Samsung         | 01/12/2021    | 174000   | JP Morgan                |
| Global Sealine       | GTT 96 GW          | XDF        | DSME            | 01/12/2021    | 173400   | Nakilat                  |
| Samsung 2307         | GTT MK III Flex    | XDF        | Samsung         | 01/12/2021    | 174000   | NYK                      |
| Hyundai Samho 8032   | GTT MK III Flex    | XDF        | Hyundai         | 01/01/2022    | 174000   | NYK                      |
| Gui Ying             | GTT 96 L03+        | XDF        | Hudong-Zhonghua | 01/01/2022    | 174000   | CSSC                     |
| Daewoo 2508          | Unknown            | XDF        | DSME            | 01/03/2022    | 174000   | Maran Gas Maritime       |

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 = 3rd March 2021

| Name                   | Containment system | Propulsion    | Yard            | Delivery date | Capacity | Primary Owner      |
|------------------------|--------------------|---------------|-----------------|---------------|----------|--------------------|
| Hudong-zhonghua H1829a | GTT 96 L03+        | XDF           | Hudong-Zhonghua | 01/03/2022    | 170520   | CSSC               |
| Samsung 2319           | GTT MK III Flex    | XDF           | Samsung         | 01/03/2022    | 174000   | JP Morgan          |
| Elisa Aquila           | GTT MK III Flex    | XDF           | Hyundai         | 01/03/2022    | 174000   | NYK                |
| Clean Cajun            | Unknown            | XDF           | Hyundai         | 01/04/2022    | 200000   | Dynagas            |
| Hyundai Samho 8033     | GTT MK III Flex    | XDF           | Hyundai         | 01/06/2022    | 173000   | NYK                |
| Hyundai Samho 8026     | GTT MK III Flex    | XDF           | Hyundai         | 01/06/2022    | 174000   | H-Line             |
| Hudong-zhonghua H1830a | GTT 96 L03+        | XDF           | Hudong-Zhonghua | 01/06/2022    | 170520   | CSSC               |
| Samsung 2337           | GTT MK III Flex    | XDF           | Samsung         | 01/07/2022    | 174000   | JP Morgan          |
| Clean Copano           | Unknown            | XDF           | Hyundai         | 01/07/2022    | 200000   | Dynagas            |
| Hyundai Samho 8091     | Unknown            | XDF           | Hyundai         | 01/08/2022    | 174000   | Knutzen            |
| Hyundai Ulsan 3185     |                    | XDF           | Hyundai         | 01/08/2022    | 174000   | Korea Line         |
| Daewoo 2509            | Unknown            | MEGI          | DSME            | 01/08/2022    | 174000   | BWGas              |
| Daewoo 2510            | Unknown            | MEGI          | DSME            | 01/09/2022    | 174000   | BWGas              |
| Prism Diversity        | Unknown            | XDF           | Hyundai         | 01/09/2022    | 180000   | SK Shipping        |
| United Prosperity      | Not Applicable     | XDF           | Hudong-Zhonghua | 01/10/2022    | 174000   | China LNG Shipping |
| Hyundai Samho 8092     | Unknown            | XDF           | Hyundai         | 01/10/2022    | 174000   | Knutzen            |
| Hyundai Ulsan 3186     |                    | XDF           | Hyundai         | 01/10/2022    | 174000   | Korea Line         |
| Hyundai Ulsan 3187     |                    | XDF           | Hyundai         | 01/11/2022    | 174000   | JP Morgan          |
| Hyundai Samho 8093     | Unknown            | XDF           | Hyundai         | 01/11/2022    | 174000   | Knutzen            |
| Minerva Amorgos        | GTT MK III Flex+   | XDF           | Samsung         | 01/11/2022    | 174000   | Minerva Marine     |
| Hyundai Ulsan 3243     | Unknown            | XDF           | Hyundai         | 01/12/2022    | 174000   | Knutzen            |
| Daewoo 2514            | Unknown            | TFDE - Azipod | DSME            | 01/12/2022    | 172500   | Sovcomflot         |
| Hyundai Ulsan 3188     |                    | XDF           | Hyundai         | 01/12/2022    | 174000   | JP Morgan          |
| Hyundai Samho 8094     | Unknown            | XDF           | Hyundai         | 01/12/2022    | 174000   | Knutzen            |
| United Glory           | Unknown            | XDF           | Hudong-Zhonghua | 01/01/2023    | 174000   | China LNG Shipping |
| Samsung 2364           | GTT MK III Flex+   | XDF           | Samsung         | 01/01/2023    | 174000   | MISC               |
| Hyundai Ulsan 3111     | GTT MK III Flex    | XDF           | Hyundai         | 01/01/2023    | 174000   | Capital Gas        |
| Hyundai Ulsan 3244     | Unknown            | XDF           | Hyundai         | 01/02/2023    | 174000   | Knutzen            |
| Samsung 2365           | GTT MK III Flex+   | XDF           | Samsung         | 01/02/2023    | 174000   | MISC               |
| Samsung 2426           | Unknown            | XDF           | Samsung         | 01/03/2023    | 174000   | Pan Ocean          |
| Hyundai Ulsan 3189     | Unknown            | XDF           | Hyundai         | 01/03/2023    | 174000   | JP Morgan          |
| Zvezda 041             | GTT MK III         | TFDE - Azipod | Zvezda SSK      | 01/03/2023    | 172600   | Smart LNG          |
| Daewoo 2515            | Unknown            | TFDE - Azipod | DSME            | 01/04/2023    | 172500   | MOL                |
| United Fortune         | Unknown            | XDF           | Hudong-Zhonghua | 01/04/2023    | 174000   | China LNG Shipping |
| Hyundai Samho 8095     | Unknown            | XDF           | Hyundai         | 01/05/2023    | 174000   | Knutzen            |
| Hyundai Ulsan 3190     | Unknown            | XDF           | Hyundai         | 01/05/2023    | 174000   | JP Morgan          |
| Hyundai Samho 8096     | Unknown            | XDF           | Hyundai         | 01/06/2023    | 174000   | Knutzen            |
| Samsung 2425           | Unknown            | XDF           | Samsung         | 01/07/2023    | 174000   | Maran Gas Maritime |
| Daewoo 2516            | Unknown            | TFDE - Azipod | DSME            | 01/07/2023    | 172500   | Sovcomflot         |
| Hyundai Samho 8105     |                    | XDF           | Hyundai         | 01/08/2023    | 174000   | Sovcomflot         |
| Hyundai Ulsan 3191     | Unknown            | XDF           | Hyundai         | 01/09/2023    | 174000   | Korea Line         |
| Daewoo 2517            | Unknown            | TFDE - Azipod | DSME            | 01/09/2023    | 172500   | Sovcomflot         |
| Zvezda 042             | GTT MK III         | TFDE - Azipod | Zvezda SSK      | 01/09/2023    | 172600   | Smart LNG          |
| Hyundai Ulsan 3198     | Unknown            | XDF           | Hyundai         | 01/10/2023    | 174000   | Korea Line         |

| Name               | Containment system | Propulsion    | Yard       | Delivery date | Capacity | Primary Owner      |
|--------------------|--------------------|---------------|------------|---------------|----------|--------------------|
| Daewoo 2518        | Unknown            | TFDE - Azipod | DSME       | 01/10/2023    | 172500   | MOL                |
| Zvezda 043         | GTT MK III         | TFDE - Azipod | Zvezda SSK | 01/10/2023    | 172600   | Smart LNG          |
| Zvezda 044         | GTT MK III         | TFDE - Azipod | Zvezda SSK | 01/11/2023    | 172600   | Smart LNG          |
| Daewoo 2519        | Unknown            | TFDE - Azipod | DSME       | 01/12/2023    | 172500   | MOL                |
| Zvezda 045         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/12/2023    | 172600   | Smart LNG          |
| Samsung 2393       | Unknown            | XDF           | Samsung    | 01/01/2024    | 174000   | NYK                |
| Samsung 2394       | Unknown            | XDF           | Samsung    | 01/02/2024    | 174000   | NYK                |
| SHI Maran 1        | GTT MK III Flex    | XDF           | Samsung    | 15/02/2024    | 174000   | Maran Gas Maritime |
| SHI Maran 2        | GTT MK III Flex    | XDF           | Samsung    | 15/02/2024    | 174000   | Maran Gas Maritime |
| SHI #1             | GTT MK III Flex    | XDF           | Samsung    | 15/02/2024    | 174000   | Maran Gas Maritime |
| SHI #2             | GTT MK III Flex    | XDF           | Samsung    | 15/02/2024    | 174000   | Maran Gas Maritime |
| Hyundai Ulsan 3221 | Unknown            | XDF           | Hyundai    | 01/07/2024    | 174000   | Pan Ocean          |
| Hyundai Ulsan 3222 | Unknown            | XDF           | Hyundai    | 01/08/2024    | 174000   | Pan Ocean          |
| Samsung 2395       | Unknown            | XDF           | Samsung    | 01/08/2024    | 174000   | NYK                |
| Zvezda 046         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/08/2024    | 172600   | Smart LNG          |
| Samsung 2396       | Unknown            | XDF           | Samsung    | 01/09/2024    | 174000   | NYK                |
| Zvezda 047         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/09/2024    | 172600   | Smart LNG          |
| HHI 2/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | MOL                |
| HHI 3/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | MOL                |
| HHI 4/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | MOL                |
| HHI 5/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | MOL                |
| HHI 6/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | K-Line             |
| HHI 7/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | K-Line             |
| HHI 8/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | K-Line             |
| HHI 9/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | K-Line             |
| HHI 1/9            | GTT MK III Flex    | XDF           | Hyundai    | 15/09/2024    | 174000   | MOL                |
| Hyundai Ulsan 3223 | Unknown            | XDF           | Hyundai    | 01/10/2024    | 174000   | JP Morgan          |
| Zvezda 048         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/10/2024    | 172600   | Smart LNG          |
| Hyundai Samho 8100 | Unknown            | XDF           | Hyundai    | 01/11/2024    | 174000   | Knutsen            |
| Zvezda 049         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/11/2024    | 172600   | Smart LNG          |
| Zvezda 050         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/12/2024    | 172600   | Smart LNG          |
| Zvezda 051         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/08/2025    | 172600   | Smart LNG          |
| Zvezda 052         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/09/2025    | 172600   | Smart LNG          |
| Zvezda 053         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/10/2025    | 172600   | Smart LNG          |
| Zvezda 054         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/11/2025    | 172600   | Smart LNG          |
| Zvezda 055         | Unknown            | TFDE - Azipod | Zvezda SSK | 01/12/2025    | 172600   | Smart LNG          |

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Data last updated = Data last updated = 3rd March 2021



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