

LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS

8 July 2021

China takes top importer slot

China has become the world's largest LNG importer, overtaking Japan, according to ICIS LNG Edge.

The title changed hands, as China's LNG demand grew rapidly, while Japan's demand to feed its gas-fired power generation slipped back, due to the restart of nuclear power plants.

For the 12 months between July, 2020 to June, 2021, ICIS LNG Edge ship tracking data showed that China had imported 77.4 mill tonnes, compared with Japan's 77.1 mill tonnes.

This was the first time that China had surpassed Japan over a 12-month period. China's imports had previously overtaken Japan in individual months.

China had overtaken South Korea to become the world's second largest LNG importer in September, 2017, based on import figures from October, 2016 to September, 2017.

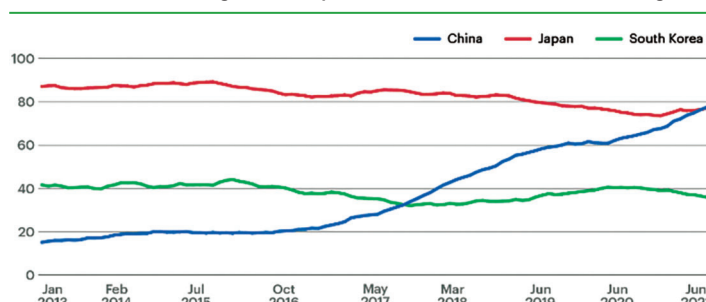
The country was already a larger consumer of natural gas than Japan, as it produces its own gas and also uses pipelines for imports, whereas Japan receives all of its gas in the form of LNG.

With China's gas consumption continuing to grow, the country is expected to retain its top spot over the coming months.

Europe hit

As for Europe, gas benchmark prices hit 13-year highs recently, as unplanned outages, maintenance and increasing Asian demand severely depleted European

China becomes world's largest LNG importer, million tonnes on 12-month rolling basis



Source: ICIS LNG Edge

inventories, Poten & Partners said in a recent webinar.

There were several reasons for the European storage demise, Poten's Oleg Vukmanovic explained.

These included - constrained Russian pipeline supply, Nord Stream maintenance, Yamal maintenance due this month, Norwegian supply problems, Skikda maintenance, plus lower Atlantic Basin production from Nigeria and Trinidad.

A late winter European cold snap also accelerated the storage volume run down. Withdrawals were particularly heavy in April.

However, Vukmanovic said that somewhat surprisingly, flexible summer supply was now coming from Algeria, mainly into the Mediterranean, especially Italy and Spain, adding that the country was now competitive on the spot market.

As mentioned above, strong Chinese demand was driving the Asian surge, while the US Gulf arbitrage was favouring Asia over Europe. There was also high de-

mand from South America, he said, especially from Brazil and Argentina.

He highlighted Turkish energy company Botas' LNG shortage, which was partly due to Turk Stream pipeline maintenance. This has resulted in the company ramping up its terminal and storage plans. Botas has tendered for around 60 cargoes for delivery in the next three years.

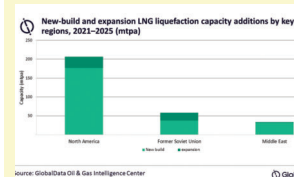
In addition, the Italian importer OLT Toscana suffered three cargo cancellations this year in favour of better market prices elsewhere.

German plans seemed to be uncertain, as coal and nuclear power supplies will be run down in the next few years but the LNG companies have not signed up any customers as yet and at least one LNG project has been cancelled.

The start of the Northern Hemisphere Winter is only around three months away, he warned. October will be the 'crunch' month for European LNG imports.

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- ICIS LNG Edge.

North America to dominate LNG liquefaction

North America will lead the global LNG liquefaction capacity additions by 2025, contributing around 63%, according to GlobalData.

The Former Soviet Union (FSU) region is a distant second, with 18%, followed by the Middle East at 10%.

GlobalData's latest report, 'Global Capacity and Capital Expenditure Outlook for LNG Liquefaction Terminals, 2021-2025', revealed that North America's newbuilding and expansion projects will see 206 mill tonnes per annum capacity added between 2021 and 2025.

Bhargavi Gandham, GlobalData Oil and Gas Analyst, commented: "In North America, the US primarily drives liquefaction capacity additions by 2025 and beyond."

"Though COVID-19 triggered project delays and postponement of a few projects in the US, it is on track to become the global leader banking on vast shale gas deposits, surpassing the traditional leaders - Australia and

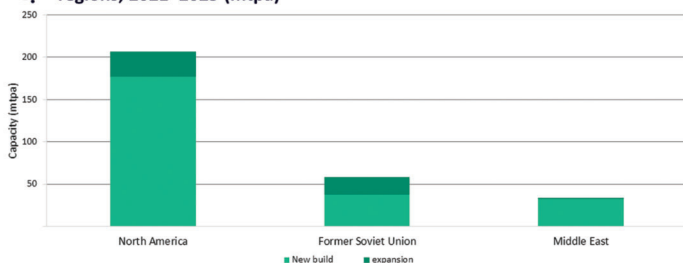
Qatar. Canada is also relying on its abundant natural gas resources to add liquefaction capacity for exports," he said.

The US is expected to account for 46% of global LNG liquefaction capacity additions. It will be the highest contributing country in North America at an expected LNG liquefaction capacity of 126 mill tonnes per annum.

The FSU's highest contributor will be Russia with 37.6 mill tonnes of additions, and Qatar will take the lead in the Middle East with 32 mill tonnes.

Among the largest projects in each region includes the US Plaquemines, with a capacity of 20 mill tonnes by 2025; Arctic-2 Floating in Russia, with 19.8 mill tonnes by 2025; and Ras Laffan North Field Expansion in Qatar, with 32 mill tonnes per annum by 2025.

New-build and expansion LNG liquefaction capacity additions by key regions, 2021-2025 (mtpa)



Source: GlobalData Oil & Gas Intelligence Center

GlobalData.

Tellurian signs Lake Charles lease

Tellurian subsidiary Driftwood LNG has exercised its long-term lease option with the Lake Charles Harbor and Terminal District on a 477 acre site in Sulphur, Louisiana.

The ground lease agreement, signed on 29th June, has an initial term of 20 years with extension options totalling up to 50 years.

Tellurian Executive Vice President and COO, Keith Teague said, "Tellurian is taking necessary steps to prepare for Driftwood LNG construction by entering into this long-term lease and executing certain projects such as road improvements and utility relocation."

"We have an active and productive relationship with Port of Lake Charles officials and they have been helpful partners from the early development and site selection of our liquefied natural gas export terminal."

"Tellurian appreciates and thanks the Lake Charles Harbor and Terminal District Board of Commissioners for their hard work and the ongoing role they will play in the success of Driftwood LNG," he said.

Carl Krielow, Lake Charles Harbor and Terminal District's President of the Board of Commissioners, added, "Driftwood LNG will bring over 6,500 construction jobs, about 400 operational jobs and millions of dollars in tax revenue and spending to Southwest Louisiana."

"As a Board, we will continue to support key developments in our dynamic deepwater seaport that enhance our community and citizens," he said.

Panama LNGC waiting times increase

The Panama Canal Authority (PCA) is gearing up for a large number of LNGC arrivals during the early part of this month.

This follows a surge in transits during the final week of June.

From 25th-29th June, 11 LNGCs arrived with reservations and three without. One LNGC without a reservation was awarded an auction slot to transit on 2nd July, the authority said in correspondence with S&P Global Platts.

Congestion occurred recently despite a rise in voyages heading east via the Cape of Good Hope, amid US Gulf Coast LNG netbacks that strongly favoured Platts' JKM through the summer, according to its analytical data.

JKM has been on a bull run

since early March, driven by persistent demand from the world's largest Asian importers.

For example, the Asian spot delivery benchmark price reached \$14.20 per MMBtu on 1st July, the highest since January this year.

Despite a narrowing of the JKM/Dutch TTF spread on 2nd July, trading sources said that spot Atlantic-sourced cargoes would likely continue to go east, thus maintaining the demand for Panama Canal transits.

The authority's waiting time projections have increased recently, reaching eight days for transits

into the Pacific on 2nd July, up from just three days a week earlier.

A similar trend was seen for westerly transits, as waiting times reached seven days last week, up from just two days a week before.

Meanwhile, the PCA also said that 1,640 LNGCs had transited the Canal via the neo-panamax locks in the five years since they opened.

Since the locks became operational, a total of 13,700 vessels transited the Canal through the larger locks. They represented 28% of all canal transits and 54% by cargo volume plus 58% in toll revenue terms.

LNG Shipping News

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

Publisher

Stuart Fryer

Editor

Ian Cochran
+44 (0)7748 144265
iancochran74@gmail.com

Ad sales enquiries

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

Subscriptions

Stephan Venter
Tel: +44 (0) 20 7253 2700
venter@lngjournal.com

Production

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

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At least two project delays reported

Mauritania and Senegal's Greater Tortue Ahmeyim (GTA) LNG project first gas is now expected in the third quarter of 2023, developer Kosmos Energy has revealed.

The project partners have received a revised forecast from the EPCIC contractor, TechnipFMC, that the delivery of the FPSO is likely to be slightly delayed, due to labour shortages at the COSCO yard in China following a ramp up in activity at the shipyard as the pandemic recedes.

This delay, currently anticipated to be around three months, is expected to push the timing of first gas to the third quarter of 2023.

BP, as operator of the GTA project, has informed the partners that due to the impacts of COVID-19 (including the FPSO delay), cost inflation and scope growth, Phase 1 project costs are expected to increase.

On the basis of the revised schedule, Kosmos said that it currently expected the gross cost for the project to be around 15% higher, resulting in an estimated increase of Phase 1 costs to first gas net to Kosmos of around \$100 mill, coming primarily in 2023.

The FPSO sale and lease back transaction is now expected to close in this quarter upon the finalisation of the documentation between the governments and partners. Following the closing of the FPSO sale and lease back transaction, the company will work to complete the re-financing of the National Oil Company loans.

In addition, Kosmos said that the partners continued to make progress on Phase 2 of the GTA LNG project and final investment decision (FID) is being targeted for late 2022.

Delfin delay

Meanwhile, liquefied LNG developer, Delfin LNG has asked US federal energy regulators for a third extension for its Louisiana FLNG export's onshore facilities to September, 2022.

In September, 2017, the US Federal Energy Regulatory Commission (FERC) authorised Delfin to build this project by September, 2019,

according to a Reuters report.

In June, 2019, Delfin asked FERC for an extension to be able to finish the project in March, 2023. FERC, however, only gave Delfin a one-year extension until September, 2020.

A year later, Delfin asked and received another one-year extension from FERC to finish the project by September, 2021.

In asking for this third extension, Delfin said global "economic conditions are recovering from the COVID-19 pandemic and the spot and short-term markets for LNG have significantly improved ... which will support the company to enter into long-term LNG offtake contracts."

This project is one of over a dozen North American LNG export facilities that have repeatedly pushed back decisions to start construction, due primarily to a lack of customers signing long-term deals needed to finance the multibillion-dollar constructions, Reuters said. ■

Pieridae changes tack on Goldboro

Pieridae Energy has issued an update on the Goldboro LNG project, which could see it cancelled.

CEO, Alfred Sorensen, said: "While Pieridae has made tremendous progress in advancing the Goldboro LNG Project, as of 30th June, 2021, we have not been able to meet all of the key conditions necessary to make a final investment decision.

"Following consultation with our Board, we have made the decision to move Goldboro LNG in a new direction. The project's fundamentals remain strong: robust LNG demand from Europe and high global LNG prices, indigenous participation, a net-zero emissions pathway forward, and support from jurisdictions across Canada. This speaks to our ongoing efforts to find a partner to take advantage of these opportunities.

"That said, it became apparent that cost pressures and time constraints, due to COVID-19, have made building the current version of the LNG project impractical.

"We will now assess options and analyse strategic alternatives that could make an LNG project more compatible with the current environment. In addition, the company will continue its work to further optimise the operation and development of our extensive Foothills resources and mid-stream assets, including our carbon capture and sequestration and blue power development.

"Pieridae continues looking for innovative ways of supplying the world with the clean natural gas it requires as a reliable bridge fuel, and providing the energy to fuel people's lives while supporting the environment and the transition to a lower-carbon economy," he concluded. ■

Three FSRUs in the pipeline

Thai government-owned Electricity Generating Authority of Thailand (Egat) has joined forces with national oil and gas conglomerate PTT to invest in a second FSRU.

The FSRU will be located in Rayong' Nong Fab region.

Egat and PTT recently signed a memorandum of understanding (MOU) to jointly develop the new facility, which will have a storage capacity of 7.5 mill tonnes per year, according to local media.

The receiving terminal is scheduled for completion in the third quarter of next year.

The Nong Fab project was initiated by PTT, which also owns an LNG receiving terminal in Map Ta Phut.

Thailand's National Energy Policy Council (NEPC) said it wanted Egat to invest 50% in the project instead of building an FSRU in the upper part of the Gulf of Thailand.

In another move which could involve an FSRU, Karachi's Port Qasim is to set to get a fourth LNG receiving terminal.

Federal Minister for Maritime Affairs, Ali Zaidi said on social media that Mitsubishi will invest \$300 mill to develop a Port Qasim LNG terminal.

"After Energas, Tabeer Energy (Mitsubishi) also close to finalising their FID to set up the [fourth] LNG Terminal," he said, according to local newswires.

Following de-regulation of the LNG industry in Pakistan, oil and gas regulatory Authority (OGRA) was said to have issued 10-year LNG importing licenses to at least two private sector companies.

Finally, GasLog Limited has

signed a Heads of Agreement to negotiate an FSRU charter with Venice Energy as part of a proposed new LNG import terminal project in South Australia.

The charterparty is still subject to customary conditions, including approval by the respective boards of directors.

Managing Director of developer Venice Energy, Kym Winter-De-whirst, said the signing was a major step forward for the project, which is earmarked for the Outer Harbor, Port Adelaide.

GasLog, CEO Paul Wogan, added that the signing of the HOA between the two companies was a major step forward in GasLog's continued interest in the FSRU sector. ■

Qatar receives interest in giant LNG project

Qatar Petroleum (QP) is currently evaluating offers to participate in the world's largest LNG development.

The country's North Field East (NFE) project has an LNG capacity of 32 mill tonnes per annum. QP has received interest that covers double the offered equity stake.

Speaking at last month's Bloomberg's Qatar Economic Forum, HE Saad Sherida Al-Kaabi, Qatari Minister of State for Energy Affairs, and QP President and CEO, confirmed; "Qatar Petroleum has received offers for double the equity available in the North Field

East project (NFE)."

Al-Kaabi added that QP was evaluating commercial offers received to participate in the LNG development project. He also revealed that QP had received off-take commitments/sales and purchase agreements (SPAs) for double the 32 mill tonnes per annum volume on offer.

At the forum, which was attended by oil and gas major's senior management, Al-Kaabi said;

"We see natural gas and the energy transition -joined at the hip- and gas/ LNG is part of the solution for a longer term transition. We are investing the majority of our CAPEX in LNG, but we are also investing in renewables, such as solar, here in Qatar but also worldwide."

He also voiced concern that during the global discussion on energy transition, there is a lack of investment in oil and gas projects, which could drive energy prices higher. He warned; "While gas and LNG are important for the energy transition, there is a lack of investments that could cause a significant shortage in gas between 2025/2030, which in turn could cause a spike in the gas market."

De-carbonisation

Turning to carbon capture and sequestration, Al-Kaabi highlighted the fact that Qatar started de-carbonising its LNG a while ago, and

that it currently captures and sequesters 2 mill tonnes per annum of CO₂, which will grow to 9 mill tonnes by 2030. "We are doing it very responsibly and we will be part of the solution for the long term," he said.

Later, QP confirmed that it had agreed a long-term Sale and Purchase Agreement (SPA) with Shell for the supply of 1 mill tonnes per annum of LNG to China for 10 years.

LNG shipments will commence in January, 2022 to various Chinese LNG terminals.

QP said it planned to supply the Chinese LNG from its Qatargas 1 project, which will become 100% owned by the Qatari energy giant on 1st January, 2022.

Following the conclusion of this agreement, China will receive around 12 mill tonnes per annum of LNG from Qatar under long term SPAs. ■



Ras Laffan could be considerably enlarged once NFE comes on stream

Predator's FSRU project still on - another shelved

UK-listed Predator Oil & Gas is currently working with Norway's Høegh LNG and Dutch contractor Jumbo Offshore to develop a planned Irish FSRU import terminal.

This is despite the Irish Government placing a moratorium on LNG infrastructure developments.

Predator said a consultancy acting on its behalf had prepared and submitted a report to the Draft Cork County Development Plan 2021 for public consultation.

Dubbed 'Mag Mell', if it comes to fruition, the terminal will be located some 50 km off the southern coast of Ireland.

"The 'Mag Mell' project has been designed to meet Ireland's immediate requirement for security and market flexibility of energy supply during a period of high demand, particularly fuelled by new investment in data centres," Predator CEO, Paul Griffiths said.

In mid-May, the Irish Government approved a policy that included a moratorium on LNG import terminal developments

pending the completion of a review of the country's supply security, which is expected to be completed by the end of this year, Ireland's Department of Environment, Climate and Communications spokesman told S&P Global Platts.

Predator said its Mag Mell project would specifically avoid LNG produced from shale gas, which seems to be the bone of contention.

"LNG will be sourced from a transparent origin where reliance on fracked gas feedstock will not be permitted," Griffiths said. "Mag Mell represents a unique near-term solution to contribute to Ireland's security of energy supply and can be commissioned and operational before other alternative solutions that have been put forward."

The project's design concepts have focused on minimising the environmental footprint relative

to other energy infrastructure projects and reducing CO₂ emissions, the company added.

According to Ireland's Climate Action Plan, it is aiming to double the electricity generated from renewable sources to 70% of the nation's consumption, with the majority of the remaining 30% of electricity generated from gas.

Currently, Ireland has no LNG import infrastructure, but two projects are under development - the Predator FSRU and New Fortress Energy's (NFE) Shannon LNG terminal.

NFE has also said that it will move forward with the project, including the winning of planning approval from the local authorities.

FSRU plan dropped

Elsewhere, UK-based technology developer InfraStrata has dropped

plans for an FSRU import terminal, which was to be located in north-west England.

The company said that there was no longer a business case for the project.

In 2019, InfraStrata agreed with Cayman Islands-based Meridian Holdings to hold exclusive talks to develop a planned 5 mill tonnes per year FSRU to be based at Barrow-in-Furness.

"The company has formally withdrawn from the proposed FSRU project in Barrow-in-Furness," InfraStrata said in a trading update.

"The energy complex has undergone a fundamental shift towards renewables and hydrogen over the past 18 months. The company no longer sees a business case for an FSRU project," the company added. ■

NEWS NUDGE

More cargoes reported

Bangladesh is to buy 3.36 mill MMBtu of LNG from Excelerate Energy for around Tk448.17 crore.

The approval for the purchase to meet the growing demand for energy came at the 23rd meeting of the Bangladesh Cabinet Committee on Government Purchase (CCGP) for this year, held virtually last month.

Briefing local reporters following the meeting, Cabinet Division Additional Secretary Md Shamsul Arefin said that Petrobangla had agreed a price of \$13.42 per MMBtu.

In addition, ENN LNG (Singapore) Pte Ltd, a unit of private Chinese gas distributor ENN Group, is to buy about 26 LNG cargoes for 2022 and 2023 deliveries via tenders.

The gas will be needed to replenish stocks as new storage facilities become operational, two trading sources told Reuters.

The cargoes were bought at premiums of about \$1-2 per MMBtu over TTF.

This agreement was in addition to a 10-year tender ENN issued in March.

ENN picked TTF pricing instead of JKM because the Netherlands-based benchmark is more liquid and has more tools to hedge pricing risk than the latter, said a trader talking with Reuters.

FERC approves Sabine Pass Train 6 startup

The US Federal Energy Regulatory Commission (FERC) has approved Cheniere's request to introduce gas and commission Train 6.

Cheniere's CEO, Jack Fusco had earlier said that the commissioning of Train 6 at Sabine Pass would occur by the end of 2021.

Bechtel was awarded the

Excelerate's legal backing in FSRU dispute

The Pakistan Law Division decreed that it was not in favour of postponing the planned drydocking of Excelerate's FSRU 'Exquisite' operating at the Engro LNG terminal.

The FSRU's drydocking was due to take place at the end of last month.

However, Pakistan's government had wanted Engro Energy LNG Terminal Pakistan (EETPL) to defer the drydocking until August.

'Exquisite's' owner, Excelerate Energy, said: "The certification by the class society is going to expire on 30th June, 2021 and in the absence of the certification, beyond that date, the FSRU cannot be allowed to operate and re-gasify LNG at Engro terminal without drydocking. And more importantly, international marine lawyers also advocated the drydocking, opposing the postponement."

The Law Division, headed by Farogh Naseem, gave its opinion after listening to inputs from several interested party legal teams, marine lawyers and lawyers for Excelerate Energy.

The legal team suggested the drydocking took place as per the plan put forward by EETPL with the terminal being closed from 29th June to 5th July, 2021.

'Exquisite' has been operated 24/7 for the last six years with no drydocking undertaken thus far, knowing that it was due from 2019.

EETPL has been highlighting the drydocking issue through official correspondence with the Sui Southern Gas Company (SSGC) and Pakistan's Petroleum Division but no action has been taken.

During the period, the FSRU's

contract to construct Sabine Pass' latest train, which will add another 5 mill tonnes per annum of LNG to the 25 mill tonnes already in operation with the first five trains.

In addition, Cheniere announced that its Board had appointed Patricia Collawn and Lorraine Mitchelmore to serve as



Excelerate's FSRU 'Exquisite' was at the centre of a drydocking dispute recently

class society has extended drydocking exemptions twice, also because of the Covid-19 pandemic.

However, SSGC did not allow her to drydock in Qatar and then it was decided that it should be carried on the terminal. So when two tanks of the FSRU were opened, it was deemed that the LNG terminal would have to be shut down for three months.

A replacement FSRU 'Sequoia' was due to arrive and Engro was reportedly annoyed as it was not easy to de-commission one FSRU and commission another FSRU.

Disqualification

In another move, Petrobras has disqualified Excelerate Energy from an FSRU facility tender for allegedly not following the rules.

Petrobras said that Excelerate

was present during a public session on the leasing of Brazil's Bahia LNG regasification terminal.

"The leasing is aligned with the company's strategy of improving its capital allocation and building a favourable environment for new investors to enter the natural gas sector," the Brazilian company said last month.

Last April, pre-qualified companies were invited to bid for the facility's island pier leases. The pier will be used to moor an FSRU. Included in the lease is midstream infrastructure connected to two delivery points at the LNG terminal.

Among the pre-qualified companies were Repsol LNG, BP Energy do Brasil, Compass gas e Energia, Total Gas & Eletricidade do Brasil, Eneva, Shell, Excelerate Energy and BG do Brasil. ■

members, effective 1st July, 2021.

Collawn and Mitchelmore are independent directors. Collawn has been appointed to the Audit and Compensation Committees and Mitchelmore has joined the Audit and Governance and Nominating Committees.

Collawn is the Chairman,

President and CEO of PNM Resources, an energy holding company based in New Mexico.

Mitchelmore has over 30 years of international oil and gas industry experience and most recently served as President and CEO of Enlighten Innovations, a Calgary-based clean technology company. ■

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Burckhardt Compression passes milestone

Burckhardt Compression has passed 1 mill operating hours with the patented Laby-GI compressors on MAN ME-GI engines.

The Laby-GI fuel gas compressor systems play an important role on LNGCs, the company claimed. As the LNG warms up during storage and transportation, the evaporated boil-off gas (BOG) must be economically managed by either using it as fuel or re-liquefying it.

Both, dual fuel engines, as well as re-liquefaction plants, require a certain operation pressure, ranging up to 300 bar. Therefore, the company's LNG solutions have been specifically designed to handle gases at low temperatures and high pressures, while meeting the requirements for operations at sea.

The compressor combines cryogenic, low-pressure labyrinth piston design and ring-sealed high-

pressure technology on a single compressor frame. This allows simultaneous fuel gas supply to low-pressure 4-stroke auxiliary engines and high-pressure gas supply to the 2-stroke main engines and a dedicated high-pressure re-liquefaction system.

All Laby-GI compressors are of a gas-tight design and no methane emissions are discharged to the atmosphere. Their sealed design helps to prevent significant greenhouse gas emissions by recycling all internal leakages without the need for any further purge gas utilisation.

A dedicated global marine service team is available for LNGC owners and operators in ports



Burckhardt's compressor has reached a milestone

worldwide, offering customer support to ensure reliable and optimised compressor performance.

Burckhardt Compression offers service solutions tailored to customers' requirements.

Trained experts provide maintenance and overhaul services based on service agreements or on request, at sea or in dry-dock worldwide, the company said.

LNGC 2-stroke propulsion market

ICIS has added daily charter rate assessments for 2-stroke powered LNGCs.

This reflects the growing importance of the market's most efficient carriers, the consultancy said.

LNGC owners plan to replace several TFDE-propelled tonnage with more efficient 2-Stroke vessels going forward.

Higher carrying capacity and optimal utilisation rates are behind this move, where 2-stroke charters can command a premium of 10-20%, compared with TFDE-propelled ships, ICIS said.

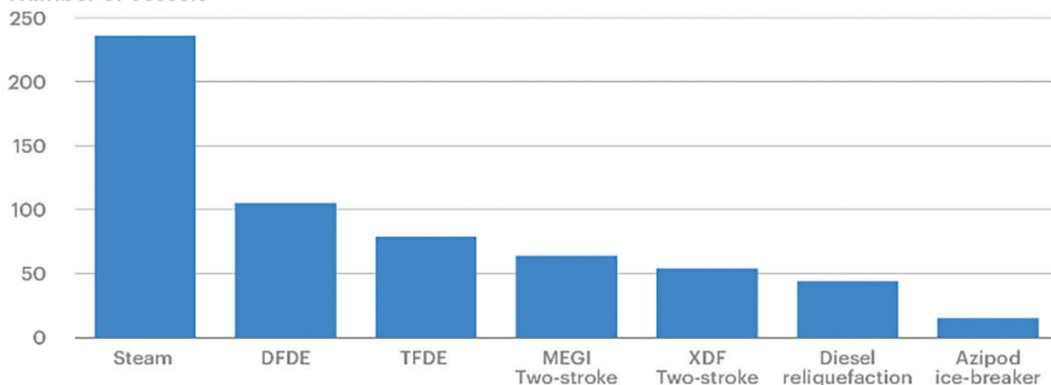
ME-GI and X-DF vessels are the most common types of 2-stroke LNGCs where gas is injected into the combustion.

With their greater carrying size and fuel efficiency, they often command a premium of \$10,000-\$20,000 per day over the TFDE sector.

New TFDE-propelled tonnage is expected to be faded out over the coming years, along with the least efficient steam propelled segment of the market.

Global LNG fleet by vessel type

Number of vessels



Source: ICIS LNG Edge

Note: Chart shows most common vessel technologies and includes vessel conversions, such as to FSRUs

Steam-propelled tonnage dominated LNG shipping for years, with nearly 250 steam driven vessels built since the early 1970s. However, retirement of this fleet is expected over the next 20 years.

There have been just over 100 DFDE vessels built and there are under 100 TFDE vessels in the fleet, according to ICIS LNG Edge data.

The current order book is dominated by X-DF vessels, with ME-GI and TDFE/DFDE vessels coming next.

Although years ago, X-DF vessels were more expensive to build than ME-GIs, the prices

have begun to align.

While South Korea's Daewoo has ordered more ME-GI powered vessels in recent years, owners, such as Hyundai have elected to build up an X-DF fleet.

Lower boil-off rates mean they are better aligned to absorb free-on board offtake from US-based LNG projects, ICIS said in its report.

The typical volume taken from US projects, although it can be marginally reduced, is not so well aligned with the carrying capacity of TFDE-propelled tonnage standing at around 160,000 cu m per ship.

X-DF and ME-GI vessels range between 174,000-180,000 cu m in capacity.

This difference allows charterers to achieve cost efficiency of 10% or higher on Asian routes.

Given the growth of US-based projects, and spot US supply, ME-GI and X-DF-type tonnage will play an increasingly larger role, ICIS said.

Two-stroke vessels are emerging as the most liquid segment of the LNG shipping market in the spot market and rates for mid-term business also carry premiums.

LNGC mooring tool launched

SHIPMOOR, a new ship mooring tool that performs static and dynamic ship mooring analyses, has been launched jointly by HR Wallingford and Witherbys.

Designed to make the assessment of mooring an LNGC a straightforward and user driven process, SHIPMOOR uses cloud-based servers to conduct live mooring analysis for each ship.

With mooring errors and disconnections often causing lengthy delays, the software mitigates the input of incorrect data by hosting an up to date, standardised database of LNG port information, enabling live sharing of information between all parties involved in the mooring of a ship, from the operator through to the assessments of office and the team at the berth.

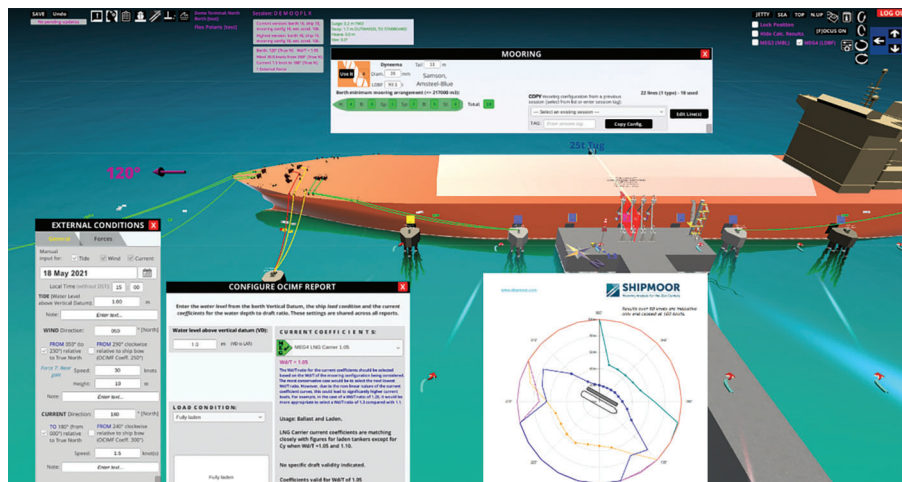
In providing transparency and accurate data alongside a 3D visualisation of any arrangement, the program provides safer and more efficient berthing, it was claimed.

Dr Mark McBride, HR Walling-

ford's Ships and Dredging Group Manager, said: "SHIPMOOR can be used for all types of ships to validate their mooring arrangements against the conditions they will encounter. In the case of LNG carriers, the results can be validated against industry specific environmental criteria.

"SHIPMOOR improves safety by mitigating the risk of mooring line failure, excessive ship movement and emergency disconnection of the loading arms," he said.

Developed with security at the



HR Wallingford and Witherbys have unveiled SHIPMOOR

forefront, SHIPMOOR runs within an internet browser and meets the IMO's newly introduced cybersecurity requirements.

Witherbys' Technical Director, Johan Machtelincx, added: "With traditional methods for preparing the mooring of LNG carriers often

causing errors and delays, SHIPMOOR is truly a 21st century solution for mooring analysis. By optimising a process that usually requires a lengthy and data intensive setup, SHIPMOOR saves vast amounts of time for each mooring operation."

NEWS NUDGE

LNGC deliveries and orders

Starting with deliveries, Greek-based Alpha Gas has taken delivery of the 173,400 cu m 'Energy Intelligence' from Daewoo Shipbuilding and Marine Engineering (DSME).

The LNGC brings Alpha Gas' fleet to five. She is the fourth delivered in the past 18 months.

Gazprom has taken her under a long term charter, joining her sistership 'Energy Integrity', which was delivered in May.

Another Greek-based LNGC owner, Dynagas has named the first of its two 174,000 cu m FSRUs building at Hudong-Zhonghua, 'Transgas Power'.

She is believed to have been chartered for 12 months to TotalEnergies.

Both FSRUs are fitted with MAN dual-fuel diesel-electric propulsion and GTT's NO96 containment system.

TotalEnergies is also chartering up to three newbuilding LNGCs

from Sovcomflot.

The French energy giant will take a 174,000 cu m LNGC, under construction at Hyundai Heavy Industries, in the third quarter of 2023 for up to seven years. It has an option to charter in another two.

The LNGC newbuilding will be fitted with an X-DF propulsion system with a direct drive to the propellers.

It will also have a partial reliquefaction system that will allow cargo boil-off gas to be returned to the tank and she will also be fitted with a hull air lubrication system which, combined with two-shaft power generators with frequency-to-current converters, is expected to deliver a further significant decrease in fuel consumption and greenhouse gas emissions, SCF claimed.

In the past couple of weeks, SCF's newbuilding 174,000 cu m 'SCF Timmerman' has begun a long-time charter with Shell.

In addition, DSME has delivered a second LNGC to Minerva Gas.

The 173,400 cu m 'Minerva Lim-

nos' joined the fleet on 30th June.

Both newbuildings feature MAN ME-GI propulsion, GTT's NO96 containment technology, and partial reliquefaction systems.

In Turkey, Botas' FSRU 'Ertuğrul Gazi' was due to take her first LNG ship-to-ship transfer at the end of last month at her mooring in Hatay province.

She is Turkey's first publicly owned FSRU.

As for new orders, Samsung Heavy Industries (SHI) has signed a Won654.5 bill deal to build three LNGCs.

The 180,000 cu m LNGCs will be delivered by February, 2024 to an undisclosed owner, believed to be Celsius Shipping.

Korea Shipbuilding & Offshore Engineering (KSOE) said it had won a Won215.5 bill order to build an LNGC.

The vessel, ordered by an undisclosed Liberian interest, will be built by Hyundai Samho Heavy Industries for delivery by November, 2023.

Elsewhere, China's Hudong-Zhonghua Shipbuilding has won

another order for an LNGC.

The shipbuilder said in a statement last week that it has signed the contract with CSSC Shipping, the financial leasing unit of China State Shipbuilding Corp, which is also the parent company of Hudong.

Hudong is already constructing two 174,000 cu m LNGCs for CSSC Shipping as part of a contract signed in December, 2019 and the latest order was thought to be a declared option.

The LNGC will be powered by WinGD's X-DF dual-fuel engines and will be fitted with GTT's NO96 L03+ containment system. It will also have a reliquefaction system fitted.

Finally, the laid up LNGC 'Mediterranean Energy' has been reported sold to Bangladesh recyclers for \$650 per ldt.

According to brokers' reports, she contains around 3,500 tonnes of aluminium and she will be delivered under tow.

The 126,975 cu m MOSS type LNGC was delivered in 1984 as the 'Dewa Maru'. She also sailed as the 'Wilgas'.

Class societies approve GTT's membrane system

GTT has received Final Approval for its NO96 Super+ technology from class societies Bureau Veritas (BV), DNV and Lloyd's Register (LR).

NO96 Super+ technology is a new version of the NO96 containment system and maintains its principal features, in particular the double patented Invar metallic membranes and the mechanical anchors, which fix the insulation panels to an LNGC's hull.

The new membrane system offers the advantage of reducing the heat ingress inside the tank by integrating insulating reinforced polyurethane foam (R-PUF) panels instead of plywood boxes, GTT said.

Thermal performance is also improved by the addition of glass wool joints, inserted between adjacent foam panels.

GTT's NO96 Super+ guarantees shipowners a daily boil off rate (BOR) of 0.085% of volume for the current standard LNGC size design of 174,000 cu m.

Philippe Berterottière, GTT Chairman and CEO, declared: "As a result of these Final Approvals, GTT

is able to offer its shipowner and shipyard partners the new NO96 Super+ technology, an innovative containment system with a greatly reduced boil off rate. Reducing boil off rate is essential for the industry as shipowners and shipyards face ever increasing economic and environmental challenges."

More orders

GTT also announced that it had won another two orders.

The first was from Hyundai Heavy Industries (HHI) for the tank design for two new LNGCs on behalf of an European shipowner.

GTT will design the 174,000 cu m vessels' tanks. They will be fitted with the GTT Mark III Flex membrane containment system.

Delivery of the vessels is scheduled for the fourth quarter of 2023.

The second order was from Hyundai Samho Heavy Industries (HSHI) for the tank design of a new LNGC on behalf of an Euro-

pean shipowner.

GTT will design the vessel's tanks, which will offer a cargo capacity 174,000 cu m and will also be fitted with the Mark III Flex membrane containment system.

The vessel will be delivered in the last quarter of 2023.

In another move, during the CWC China LNG & Gas Summit, held in Shanghai last month, GTT signed a Technical Assistance and License Agreement (TALA) with COSCO Shipping Qingdao, a subsidiary of COSCO Shipping Group.

This agreement enables the licensee to offer solutions using GTT's membrane containment systems for the construction of several types of LNG storage facil-

ities, both for marine and onshore applications.

COSCO Shipping Qingdao obtained its license from GTT after successfully completing a qualification process that began in June, 2019, including the construction of a GTT technology mock-up.

GTT said that this agreement marks a further step in the deployment of its technologies in China, making COSCO Shipping Qingdao the second Chinese licensed GTT outfitter.

COSCO Shipping Qingdao is currently investing in a large scale mock-up training centre, plus equipment for the installation and welding of GTT's membrane technology. ■

SHI wins AiP for fuel cell-powered LNGC

An LNGC project fitted with an eco-friendly solid oxide fuel cell propulsion system developed by Samsung Heavy Industries (SHI) and US public company Bloom Energy, has been awarded Approval in Principle (AiP) from DNV.

SHI partnered with Bloom Energy to develop core technologies for highly efficient SOFCs for ships. SOFC is an electrochemical conversion device that produces electricity directly from oxidising fuel and ensures high combined heat and power efficiency, long-term stability, fuel flexibility, low emissions and relatively low cost, the South Korean ship-

builder explained.

"Fuel cell propulsion ships can replace internal combustion engines with fuel cells to drastically reduce air pollutant emissions, as well as noise vibration and maintenance costs," SHI's technology development centre head, Chung Ho-hyun said.

The fuel cell-powered LNGC does not require an internal combustion engine, nor equipment that uses oil, SHI added.

SHI said it would conduct empirical tests at its Goeje LNG demonstration facilities before embarking on a global marketing campaign. ■

NEWS NUDGE

Gate to increase regas capacity

Rotterdam/Maasvlakte-based Gate receiving terminal, a joint venture between Vopak and Gasunie, said it had received enough market interest to undergo a capacity upgrade.

The upgrade will amount to 0.5 bill cu m per annum, bringing the capacity up to

12.5 bill cu m.

Gate has seen periods of very high utilisation, illustrated by record regasification of around 1.1 bill cu m in May.

The additional send-out capacity is scheduled to come on-stream on 1st October, 2024.

Also in May, Gate received its first carbon-neutral LNG cargo.

It was shipped jointly by TotalEnergies and OMV on the 'SCF La Perouse', which is chartered to the French energy giant. ■

Monthly Large LNGC Values*

Newbuildings (174,000 cu m)	\$184.69 mill
Five years old (160,000 cu m)	\$141.39 mill
Total Fleet (522 ships)	\$57.41 bill
Orderbook (123 ships)	\$23.58 bill

Source: VesselsValue (21/06/21)

*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	\$55,000	-\$9,000
West of Suez	\$73,000	-\$7,000
12 mos T/C	\$90,000	+\$8,000

*Since last report (24/06/21)

Source: Fearnleys (07/07/21)

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WORLD LNG CARRIER ORDERBOOK

Name	Containment system	Propulsion	Yard	Delivery date	Capacity	Primary Owner
Energy Intelligence	GTT 96 GW	MEGI	DSME	01/06/2021	174000	Alpha Gas
Minerva Limnos	GTT 96 GW	MEGI	DSME	01/06/2021	173400	Minerva Marine
Mu Lan	GTT 96 L03+	XDF	Hudong-Zhonghua	01/06/2021	174000	CSSC
Yiannis	GTT 96 GW	MEGI	DSME	01/06/2021	174000	Maran Gas Maritime
Maran Gas Isabella	GTT 96 GW	XDF	DSME	01/07/2021	174000	Maran Gas Maritime
Minerva Chios	GTT MK III Flex+	XDF	Samsung	01/07/2021	174000	Minerva Marine
Mol Hestia	Unknown	MEGI	DSME	01/07/2021	174000	MOL
Adamastos	GTT MK III Flex	XDF	Hyundai	01/08/2021	174000	Capital Gas
Attalos	GTT MK III Flex	XDF	Hyundai	01/08/2021	174000	Capital Gas
Celsius Carolina	Unknown	XDF	Samsung	01/08/2021	180000	Celsius Shipping
Gaslog Winchester	GTT MK III Flex+	XDF	Samsung	01/08/2021	180000	GasLog
Asklipios	GTT MK III Flex	XDF	Hyundai	01/09/2021	174000	Capital Gas
Diamond Gas Victoria	GTT MK III Flex	XDF	Hyundai	01/09/2021	174000	NYK
Global Sea Spirit	GTT 96 GW	XDF	DSME	01/09/2021	173400	Nakilat
Hellas Athina	GTT MK III Flex	XDF	Hyundai	01/09/2021	174000	Latsco Shipping
Lng Enterprise	GTT MK III Flex	XDF	Samsung	01/09/2021	174000	NYK
Maran Gas Kalymnos	GTT 96	XDF	DSME	01/09/2021	174000	Maran Gas Maritime
Hyundai Ulsan 2939	GTT MK III Flex	XDF	Hyundai	01/10/2021	180000	SK Shipping
Lng Endeavour	GTT MK III Flex	XDF	Samsung	01/10/2021	174000	NYK
Maran Gas Ithaca	GTT 96 GW	XDF	DSME	01/10/2021	174000	Maran Gas Maritime
Daewoo 2506	GTT 96	MEGI	DSME	01/11/2021	174000	Maran Gas Maritime
Global Sealine	GTT 96 GW	XDF	DSME	01/12/2021	173400	Nakilat
Lng Endurance	GTT MK III Flex	XDF	Samsung	01/12/2021	174000	NYK
Samsung 2336	GTT MK III Flex	XDF	Samsung	01/12/2021	174000	JP Morgan
Tenergy	GTT MK III Flex	XDF	Hyundai	01/12/2021	174000	Tsakos Energy Navigation
Vivit City Lng	GTT MK III Flex	XDF	Hyundai	01/12/2021	174000	H-Line
Grace Emilia	GTT MK III Flex	XDF	Hyundai	01/01/2022	174000	NYK
Gui Ying	GTT 96 L03+	XDF	Hudong-Zhonghua	01/01/2022	174000	CSSC
Elisa Aquila	GTT MK III Flex	XDF	Hyundai	01/03/2022	174000	NYK
Hudong-zhonghua H1829a	GTT 96 L03+	XDF	Hudong-Zhonghua	01/03/2022	170520	CSSC
Maran Gas Kythira	Unknown	XDF	DSME	01/03/2022	174000	Maran Gas Maritime
Samsung 2319	GTT MK III Flex	XDF	Samsung	01/03/2022	174000	JP Morgan
Clean Cajun	Unknown	XDF	Hyundai	01/04/2022	200000	Dynagas
Hudong-zhonghua H1788a	GTT 96	XDF	Hudong-Zhonghua	01/04/2022	79960	K-Line
Hudong-zhonghua H1789a	GTT 96	XDF	Hudong-Zhonghua	01/05/2022	79960	K-Line
Grace Freesia	GTT MK III Flex	XDF	Hyundai	01/06/2022	173000	NYK
Hudong-zhonghua H1830a	GTT 96 L03+	XDF	Hudong-Zhonghua	01/06/2022	170520	CSSC
Vivit Arabia Lng	GTT MK III Flex	XDF	Hyundai	01/06/2022	174000	H-Line
Clean Copano	Unknown	XDF	Hyundai	01/07/2022	200000	Dynagas
Samsung 2337	GTT MK III Flex	XDF	Samsung	01/07/2022	174000	JP Morgan
Bw Iris	GTT 96 GW	MEGI	DSME	01/08/2022	174000	BWGas

Name	Containment system	Propulsion	Yard	Delivery date	Capacity	Primary Owner
Santander Knutsen	Unknown	XDF	Hyundai	01/08/2022	174000	Knutsen
Sm Albatross		XDF	Hyundai	01/08/2022	174000	Korea Line
Bw Cassia	GTT 96 GW	MEGI	DSME	01/09/2022	174000	BWGas
Prism Diversity	Unknown	XDF	Hyundai	01/09/2022	180000	SK Shipping
Malaga Knutsen	Unknown	XDF	Hyundai	01/10/2022	174000	Knutsen
Sm Bluebird		XDF	Hyundai	01/10/2022	174000	Korea Line
United Prosperity	Not Applicable	XDF	Hudong-Zhonghua	01/10/2022	174000	China LNG Shipping
Alicante Knutsen	Unknown	XDF	Hyundai	01/11/2022	174000	Knutsen
Minerva Amorgos	GTT MK III Flex+	XDF	Samsung	01/11/2022	174000	Minerva Marine
Orion Song		XDF	Hyundai	01/11/2022	174000	JP Morgan
Daewoo 2514	Unknown	TFDE - Azipod	DSME	01/12/2022	172500	Sovcomflot
Huelva Knutsen	Unknown	XDF	Hyundai	01/12/2022	174000	Knutsen
Hyundai Ulsan 3243	Unknown	XDF	Hyundai	01/12/2022	174000	Knutsen
Orion Sage		XDF	Hyundai	01/12/2022	174000	JP Morgan
Asterix I	GTT MK III Flex	XDF	Hyundai	01/01/2023	174000	Capital Gas
Hudong-zhonghua H1837a	GTT 96 L03+	XDF	Hudong-Zhonghua	01/01/2023	79960	Shenzhen Gas
Samsung 2364	GTT MK III Flex+	XDF	Samsung	01/01/2023	174000	MISC
United Glory	Unknown	XDF	Hudong-Zhonghua	01/01/2023	174000	China LNG Shipping
Hyundai Repsol	GTT MK III Flex	XDF	Hyundai	15/01/2023	174000	Hyundai LNG Shipping
Samsung 2365	GTT MK III Flex+	XDF	Samsung	01/02/2023	174000	MISC
Samsung 2426	Unknown	XDF	Samsung	01/03/2023	174000	Pan Ocean
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
Hudong-zhonghua H1833a	Unknown	XDF	Hudong-Zhonghua	01/04/2023	174000	China LNG Shipping
El Ferrol Knutsen	Unknown	XDF	Hyundai	01/05/2023	174000	Knutsen
Extremadura Knutsen	Unknown	XDF	Hyundai	01/06/2023	174000	Knutsen
Hyundai Ulsan 3244	Unknown	XDF	Hyundai	01/06/2023	174000	Knutsen
FSRU now LNGC	GTT NO 96	MEGI	DSME	15/06/2023	174000	MOL
Daewoo 2516	Unknown	TFDE - Azipod	DSME	01/07/2023	172500	Sovcomflot
Hyundai Ulsan 3189	Unknown	XDF	Hyundai	01/07/2023	174000	JP Morgan
Samsung 2425	Unknown	XDF	Samsung	01/07/2023	174000	Maran Gas Maritime
Hyundai Samho 8105	GTT MK III Flex	XDF	Hyundai	01/08/2023	174000	Sovcomflot
Hyundai Ulsan 3190	Unknown	XDF	Hyundai	01/08/2023	174000	JP Morgan
Daewoo 2517	Unknown	TFDE - Azipod	DSME	01/09/2023	172500	Sovcomflot
Sm Golden Eagle	Unknown	XDF	Hyundai	01/09/2023	174000	Korea Line
Zvezda 042	GTT MK III	TFDE - Azipod	Zvezda SSK	01/09/2023	172600	Smart LNG
Daewoo 2518	Unknown	TFDE - Azipod	DSME	01/10/2023	172500	MOL
Sm Kestrel	Unknown	XDF	Hyundai	01/10/2023	174000	Korea Line
Zvezda 043	GTT MK III	TFDE - Azipod	Zvezda SSK	01/10/2023	172600	Smart LNG
Greek owner 1/4		ME-GA	Hyundai	15/10/2023	200000	Dynagas
HLS	GTT NO 96	MEGI	DSME	15/10/2023	174000	Hyundai LNG Shipping

Name	Containment system	Propulsion	Yard	Delivery date	Capacity	Primary Owner
Hyundai European Owner	GTT MK III Flex	XDF	Hyundai	15/10/2023	174000	
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
Jiangnan H2637	GTT MK III Flex	XDF	Jiangnan	01/12/2023	79800	Jovo Energy
Zvezda 045	Unknown	TFDE - Azipod	Zvezda SSK	01/12/2023	172600	Smart LNG
Greek owner 2/4		ME-GA	Hyundai	15/12/2023	200000	Dynagas
Hyundai Ulsan 3294	Unknown	XDF	Hyundai Inds - Ulsan	01/01/2024	174000	Hyundai LNG Shipping
Greek owner 3/4		ME-GA	Hyundai	15/03/2024	200000	Dynagas
Hyundai Ulsan 3295	Unknown	XDF	Hyundai Inds - Ulsan	01/04/2024	174000	Hyundai LNG Shipping
Hyundai Ulsan 3296	Unknown	XDF	Hyundai Inds - Ulsan	01/06/2024	174000	Hyundai LNG Shipping
Greek owner 4/4		ME-GA	Hyundai	15/06/2024	200000	Dynagas
Zvezda 046	Unknown	TFDE - Azipod	Zvezda SSK	01/08/2024	172600	Smart LNG
Hyundai Ulsan 3221	Unknown	XDF	Hyundai	01/09/2024	174000	Pan Ocean
Maran 1	GTT MK III Flex	XDF	Samsung	01/09/2024	174000	Maran Gas Maritime
Maran 2	GTT MK III Flex	XDF	Samsung	01/09/2024	174000	Maran Gas Maritime
Zvezda 047	Unknown	TFDE - Azipod	Zvezda SSK	01/09/2024	172600	Smart LNG
Hyundai Ulsan 3222	Unknown	XDF	Hyundai	01/10/2024	174000	Pan Ocean
Zvezda 048	Unknown	TFDE - Azipod	Zvezda SSK	01/10/2024	172600	Smart LNG
Hyundai Samho 8100	Unknown	XDF	Hyundai	01/11/2024	174000	Knutsen
Hyundai Ulsan 3223	Unknown	XDF	Hyundai	01/11/2024	174000	JP Morgan
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

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 = 23rd June 2021



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WORLD SMALL SCALE LNG FLEET*

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

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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	Green Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	Cardissa	6,500	LNG	Northwest Europe	Yes	Shell
2018	Kairos	7,500	LNG	Baltic	Yes	Bernhard Schulte
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	Bunker Breeze	1,200	LNG	Barcelona	Yes	Suardiaz Energy Shipping
2018	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang
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	Avenir LNG
2020	Avenir Accolade	7,500	LNG	Mediterranean	Yes	Avenir LNG
2020	Avenir Aspiration	7,500	LNG		Yes	Avenir LNG
2020	Kaguya	3,500	LNG	Japan	Yes	CLS
2020	CNTIC VPOWER Global	28,000	LNG	Myanmar	Yes	Dalian Inteh Group
2020	Ecobunker Tokyo Bay	2,500	LMG	Japan	Yes	Ecobunkers
2020	Optimus	6,000	LNG	NWE	Yes	Elenger
2020	ENN TBN	8,500	LNG	China	Yes	ENN
2020	FueLNG Bellina	7,500	LNG	Singapore	Yes	FueLNG
2020	SM Jeju LNG2	7,500	LNG	Korea	Yes	Korea Line
2020	Q-LNG 4000	4,000	LNG	US Coast	Yes	Q-LNG Transport/Harvey Gulf
2020	Flexfueller 002	1,480	LNG	Antwerp	Yes	Titan LNG
2021	Avenir Ascension	7,500	LNG		Yes	Avenir LNG
2021	Avenir Allegiance	20,000	LNG	Worldwide	Yes	Avenir LNG
2021	Bergen LNG	850	LNG	Norway	Yes	Bergen Tankers
2021	Dmitry Mendeleev	5,800	LNG	Russia	Yes	Gazprom Neft
2021	JMU TBN	2,500	LNG	Japan	Yes	JMU
2021	Ravenna Knutsen	30,000	LNG	Mediterranean	Yes	Knutsen OAS
2021	PE TBN	12,000	LNG	Singapore	Yes	MOL
2021	TBN	18,600	LNG	Mediterranean	Yes	MOL
2021	TG TBN	500	LNG	Korea	Yes	Trans Gas
2022	Veder TBN	30,000	LNG	Worldwide	Yes	Anthony Veder
2022	Avenir Achievement	20,000	LNG	Worldwide	Yes	Avenir LNG
2022	Kuntsen TBN	5,000	LNG	Spain	Yes	Knutsen OAS
2022	Clean Cañaveral	5,400	LNG	USG	Yes	PNE
2023	Cryopeak TBA	4,000	LNG	West Canada	Yes	Cryopeak
2023	Kuntsen TBN	12,500	LNG	Spain	Yes	Knutsen OAS
2023	SM Jeju LNG3	7,500	LNG	Korea	Yes	Korea Line
2023	Pan Ocean TBN	18,000	LNG	USG	Yes	Pan Ocean Co
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG

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