LNG Shipping News

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LNG supply to remain much the same - ICIS

More of the same this year is the prediction from the Independent Commodities Intelligence Services (ICIS) in its third annual Global LNG Supply & Demand Outlook.

For example, ICIS said that production additions will again be limited, and gas demand will grow while remaining well below historical normal levels in Europe.

With ongoing declines in Japan and South Korea, but modest LNG import-growth in China continuing, the unconstrained global market was undersupplied on an annual basis.

Once supply is measured at the point of destination, rather than at the point of production, a net 12 mill tonnes of supply shortfall will be seen. Price signals, therefore, will need to remain firm at times through the year to drive the market towards a balance.

A return to pre-Ukraine war, and pre-covid, price levels are not expected this year. Upside risk is seen should China's economy firm more than expected or if sanctions and shipping constraints make Russia's Arctic LNG 2 Train 1 project a non-starter.

Downside risks are possible in Europe, particularly if gas storage holds at very healthy levels driven by ongoing poor industrial recovery and yet more mild weather that dilutes heating demand.

ICIS predicted only a small annual increase in global LNG output this year, rising just over 1% from 410.9 mill tonnes last year to 416.3 mill tonnes in 2024.

This is due to a relatively limited number of new liquefaction projects scheduled to come online, while a downturn from older plants with declining feedgas will likely offset part of the volume from the new projects.

However, there is a major new wave of projects scheduled to start production from 2025 onwards - first from the US, Canada and Mexico and later from Qatar. If some of those projects make good progress, there could be some growth upside later this year.

This year's main projects start-ups are the relatively small 0.6 mill tonnes per annum Congo LNG and 2.5 mill tonne Tortue LNG projects off west Africa, as well as the 1.4 mill tonnes per year Fast LNG project off Altamira, Mexico. An increase could also be seen later this year from early US projects like Corpus Christi's expansion.

Russia's Arctic LNG project remains a key uncertainty. The first 6.6 mill tonnes per annum train started producing LNG in late 2023, according to local reports. But while the plant is understood to be operational, it remains unclear how much it can load and sell in the market, due to the impact of sanctions.

Unconstrained demand

As for demand, ICIS forecast unconstrained LNG demand in 2024 at 423.4 mill tonnes, a 5% rise on a year earlier. Given the supply additions, this will not be able to match the 20.8 mill tonnes year-on-year rise, as this import level will not be met, highlighting the ongoing tightness in the market.

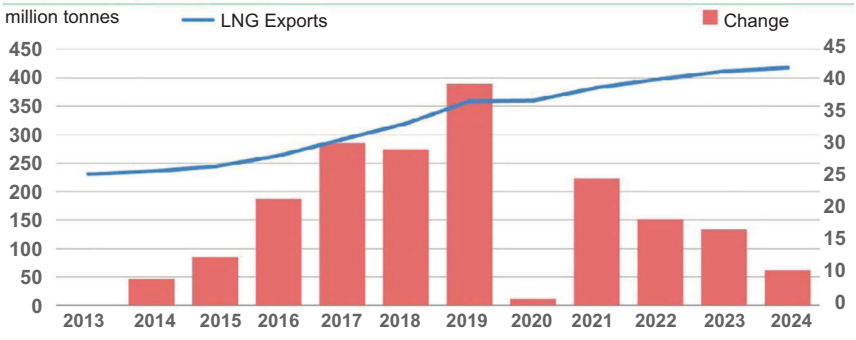
China will add five new terminals and its LNG imports are expected to rise 9% year-on-year, to 78 mill tonnes. Given the wider Chinese economic environment, the 2024 LNG imports will be below the all-time high set in 2021.

Japan will see its LNG arrivals dip almost 3% to 64.3 mill tonnes, as the ongoing nuclear revival and lower overall power demand reduce the required run-rates at gas-fired power plants. South Korea's LNG imports will fall 10% to 40.1 mill tonnes, for similar reasons.

Having flat-lined in 2023, relative to a year earlier, LNG imports by the wider EU and UK market area are expected to increase 15%.

Assuming underlying gas demand begins to improve in the latter part of 2024 in particular, but with no major changes in pipe supply, ICIS predicted that LNG increases will largely cover the difference and therefore rise to 128 mill tonnes. ■

Globl LNG Exports



Source: ICIS LNG Edge

SHIPPING NEWS AGENDA

GIIGNL's take on US new projects' pending pause

The decision of the US administration to pause pending approvals came as a surprise for all LNG importers.

Even though it can be seen as a temporary measure, it creates a regulatory risk for a long-term capital-intensive industry.

It sends a negative message in terms of reliability of the US as an energy partner for Europe and the rest of the world, French-based organisation International Group of Liquefied Gas Importers (GIIGNL) said.

Regarding the role of LNG in the energy transition, it could create conditions for gas-to-coal switches.

US LNG has proven to be a reliable alternative source of gas for Europe after the Ukraine invasion and the related fall in pipe gas import from Russia. The probability of a comeback of Russian pipe gas in the medium term remains low and US LNG is still expected to play a key role in European Union gas supply.

For 2023, GIIGNL's first estimates showed that US LNG imported by the EU reached 44 mill tonnes, ie 45% of total EU LNG imports and 15% of EU gas consumption.

A local pause in the development of LNG projects should not have any major positive impacts on GHG emissions from a global LNG market. On the contrary, it could lead an increase of emissions, compared to a situation with no freeze.

Depending on the duration of this freeze, it could keep the global LNG market tight, creating price conditions that could lead to switch from gas to coal or oil products.

This switch back was seen in both Asia and Europe when gas prices peaked in the aftermath of the Ukrainian crisis.

As shown by the 2022 crisis, market forces have been able to allocate LNG flows efficiently. Capacity development driven by market fundamentals both at the liquefaction and regasification stages should not be hindered by political decisions, GIIGNL stressed

These developments are necessary for energy mixes that will embody more and more renewables requiring flexibility in power generation and alternatives for hard-to-electrify activities. So, not only additional LNG capacities should provide an efficient complement to renewables; they also pave the way for the development of fully de-carbonised gases like e-methane.

To conclude, in a world where political risks are increasing every day, the LNG industry needs the most stable regulatory framework possible to create the conditions of a harmonious development on the road to a cleaner future.

Understanding

Those concerned about steady supplies of LNG are reassured when they understand President Joe Biden's pause on LNG export approvals does not affect currently permitted shipments, a US State Department official has said.

"I've found that our allies who raise these issues with me, tend to be quickly reassured when you explain to them what this is, which is a pause, not a reversal," Geoffrey Pyatt, an assistant secretary for energy resources, told reporters in a call. "This policy will have no impact on currently permitted LNG exports."

The pause could stop future approvals for exports from LNG projects until after the 5th November US election.

More than 150 members in the Republican-controlled US House of Representatives have written to President Biden urging him to end the review and approve all pending applications.

"Policies supporting LNG exports will grow our economy, create good paying jobs, and strengthen the energy security of our allies," they said in the letter.

Today, the US is the world's top LNG exporter and Pyatt said the shipments would roughly double by the end of the decade, as already approved projects ramp up.

Germany's gas importers SEFE and Uniper, Japan's top LNG buyer JERA and lobby groups have all said the US decision might compromise energy security worldwide.

Europe will have enough gas supply for the next 10 years and beyond despite the US pause, EU energy officials and analysts have said, dismissing the warnings. ■

The Biden administration has caused a furore with the proposed pause in new LNG projects

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LNG shipping rates could soften further

LNGC freight rates could go south, as supply dynamics are expected to have a negative impact.

According to Greek-based shipbroker Intermodal, the Biden administration's decision to temporarily halt new LNG export approvals has injected new uncertainty into global gas markets.

With the US emerging as the top LNG exporter last year ahead of Australia and Qatar, this policy shift clouds the forecasts of future supply, demand and price dynamics.

This regulatory roadblock is having a direct impact across the gas value chain. US gas producers face delays to multi-billion-dollar facilities and are scrambling to re-project costs and timelines.

Overseas buyers may seek alternative suppliers in anticipation of dampened US export growth. Shipping companies are possibly preparing for weaker long-term demand for vessels, amidst a time when the orderbook to fleet ratio stands above 50%, and with the majority of them being delivered either this year or next.

Intermodal's Research Analyst, Fotis Kanatas, said in the report: "In the short term, experts predict minimal price impact given today's well supplied market. However, the signalling effect of America's wavering commitment as a reliable LNG supplier could have a deeper impact.

"The US emerged as the top supplier of the gaseous fuel in 2023, with the biggest importer being by far Europe, with 118 mill cu m, followed by Asia at not even half the volumes. It is evident that Europe turned to the US after Russian gas significantly decreased after the war In Ukraine.

"Taking a closer look at the other big LNG suppliers, we understand that Qatar and Australia mainly supply Asia and its biggest economies, China, Japan and South Korea, meaning that Europe, will be the most affected should the ban result in fewer cargoes coming out of the US.

"With ongoing projects that will remain unaffected, the US will retain its leading position as an LNG exporter. With this in mind, it is worth taking a look at the current fleet fundamentals and how freight rates could be affected by the decision in the future.

"Freight rates on the spot market have followed the seasonal pattern of the last five years, with rates peaking before winter and softening in spring and summer, currently standing at $53,000 per day (at the end of January) for a 174,000 cu m vessel. Conversely, one year timecharter rates for vessels of the same size have been softening steadily since the end of 2021, and stood at $36,000 per day, when demand for vessels reached record highs amid uncertainty over Russian supplies," he said.

Further pressure

He added that the current orderbook shows that the extra capacity is likely to put further pressure on supply. Furthermore, more than half of the vessels in service are no more than 10 years old, which means that such a young fleet will be in operation for many years to come. In addition, the current orderbook is front loaded, with 170 vessels coming due to be delivered over the next two years.

Looking at the fundamentals, it is clear that the supply of LNGCs will increase in the future, as will the demand for LNG. The recent US ban is unlikely to change the status quo in terms of the largest players, but the reduced export options amidst a rapid increase in vessel supply could potentially push freight rates lower in the coming years, the report concluded. ■

Cryopeak expands its Canadian empire

Cryopeak LNG Solutions Corp has merged with Ferus Natural Gas Fuels to form a new LNG production and distribution technology-focused entity, named Cryopeak Energy Solutions Corp.

In addition, Cryopeak has acquired all of the LNG assets from Campus Energy Partners Infrastructure, including the regional LNG production facility located in Dawson Creek, British Columbia.

Through the merger and acquisition, Cryopeak will be the largest private, vertically integrated, LNG producer and service provider in Canada, the company claimed.

As a result, Cryopeak will manage three LNG production facilities in Western Canada and operate the largest fleet of LNG transportation, mobile storage, and regasification equipment.

"We are very excited with the merger and acquisition which supports Cryopeak in its goal of being a leader in the growing LNG market. With increased production capacity and diverse equipment portfolio, Cryopeak is uniquely positioned to support our customers to integrate LNG safely and efficiently into their operations," Calum McClure, CEO of Cryopeak Energy Solutions said. ■

More Chinese cargoes revealed

Chinese domestic trader, Guanghui Energy issued a strip tender on 6th February to purchase 12 LNG cargoes.

They are scheduled to be delivered monthly from April, 2024 to March, 2025, according to a report from S&P Global and are based on a price linked to JKM.

Sources told the newswire that the tender was due to close on 7th February.

A trader said that the tender was expected to be awarded at discounted levels, citing the example of Kansai's recent buy tender being awarded at discounts.

Japan's Kansai Electrics issued a buy tender on 23rd January for 12 cargoes with deliveries from April, 2024 to February, 2025. Several traders said that the tender was partially awarded with discounts against the JKM FMA.

China's state-owned CNOOC also issued a strip tender on 31st January, seeking multiple cargoes for March to May, 2024 deliveries. According to market sources, three or more cargoes were awarded for April and May at slight discounts to the JKM FMA, S&P revealed.

Last week's drop in spot Asian LNG prices to below $9.5 per MMBtu ahead of the Lunar New Year holiday period incentivised importers to tap the spot market. Buyers said that they were on the sidelines waiting for further price declines.

"Importers are trying to capitalise on the softening JKM prices to negotiate better discounts, as many buyers are still aiming for lower bidding prices, especially with the decline in domestic LNG prices," said a Chinese company source talking with S&P.

"The demand outlook for the coming months remains uncertain, leaning towards a bearish sentiment," said a Chinese buyer, adding that although there is potential for demand recovery driven by industrial production, the extent of any growth remained uncertain.

Guanghui Energy operates the 5 mill tonnes per year Qidong LNG receiving terminal in eastern China's Jiangsu province. ■

India moves to boost imports

Recent talk of mega LNG sale and purchase agreements (SPAs) being signed by India are beginning to firm up.

Last week, QatarEnergy announced that it had signed a 20-year SPA with Indian state-owned Petronet LNG to supply 7.5 mill tonnes per annum of LNG.

Under the terms of the SPA, the Qatari contracted LNG will be delivered on an ex-ship (DES) basis to terminals across India utilising QatarEnergy's vast LNGC fleet, starting May, 2028.

The signing was celebrated during a special ceremony held in Goa, during India's Energy Week.

The company has also confirmed that it is to supply Sri Lanka with LNG starting next year.

Initially, the LNG will be supplied via containers, but later the company will site an FSRU on the island.

Petronet LNG CEO, A K Singh, said at last week's meeting, "They, (Sri Lanka), have already installed about 300 MW of gas based, power plants, and still they don't have gas. Sri Lanka approached us to set up an LNG terminal, which is going to take more time, about three to four years, to set up an FSRU based terminal."

The supplies would last for five years, during which Petronet, will also provide the FSRU to be moored at Colombo.

Singh also said that Indian LNG imports would rise to 150 mill tonnes per year by 2030 and the country will need the equivalent re-gasification capacity to achieve its targets.

This compares to current levels of 22 mill tonnes per year.

Singh added that India's consumption of natural gas stands at 150 mill standard cu m per day, of which 45% is imported.

GAIL purchase

Another Indian state run company, GAIL (India) is to purchase about 4.5 mill tonnes per annum from Petronet LNG following the contract renewal with QatarEnergy.

In accordance with the updated LNG SPA, GAIL will offtake its part of the volumes back-to-back.

As in the previous 1999 deal, GAIL will take up 60% of the LNG volumes under the new SPA, followed by Indian Oil Corp (IOC) (30%) and Bharat Petroleum Corp (BPCL) (10%), following regasification mainly from PLL's Dahej Terminal, almost back-to-back.

GAIL is selling more US LNG in European markets and making spot purchases to hedge against delays, due to the Red Sea crisis, head of marketing Sanjay Kumar told a press conference at last week's event.

"It was an operational requirement. We had to sell some of our US LNG in Europe to manage our shipping schedule," Kumar said.

Kumar explained that the Red Sea crisis was delaying the supply of LNG by up to seven days, as cargoes were now diverted around Africa's Cape of Good Hope. The Indian energy company has four LNGCs on long term charter and any delay could impact its supply commitments.

GAIL has long term deals to buy 5.8 mill tonnes a year of US LNG, split between Dominion Energy's Cove Point plant and Cheniere Energy's Sabine Pass site in Louisiana.

Meanwhile, earlier this year, BPCL agreed a 1 mill tonnes supply contract from the $20 bill Mozambique project, which is expected to commence operations by 2028.

BPCL subsidiary, Bharat PetroResources (BRPL) through its Netherlands-based second subsidiary BPRL Ventures Mozambique holds a 10% stake in the LNG project.

Along with ONGC Videsh (OVL) and Oil India (OIL), BPCL holds a 30% stake in the project, which is being led by TotalEnergies.

Work on the project is expected to restart by July this year, BPCL management said in a results call at the end of January. ■

Three way offtake deal agreed

Chesapeake Energy Corp, Delfin LNG and Gunvor Group, through Gunvor Singapore, have agreed an LNG export deal that includes executed sales and purchase agreements (SPAs) for long-term liquefaction offtake.

Under the SPAs, Chesapeake will purchase around 0.5 mill tonnes of LNG per annum from Delfin at a Henry Hub price and a contract targeted start date in 2028.

The LNG will be delivered to Gunvor on an FOB basis with the sales price linked to the Japan Korea Marker (JKM) for a period of 20 years.

These volumes will represent 0.5 mill tonnes per annum of the previously announced up to 2 mill tonnes HOA with Gunvor.

Nick Dell'Osso, Chesapeake President and CEO, said, "(This) announcement cements an important step on our path to 'Be LNG Ready' and is further recognition of the depth of our portfolio and strength of our financial position.

"We are pleased to formalise our agreement, which provides diversification and access to global LNG pricing while enabling the delivery of affordable, reliable, lower carbon energy to markets in need," he said.

Dudley Poston, Delfin CEO, added: "We are excited to partner with a premier company like Chesapeake. We believe our unique liquefaction solution provides Chesapeake with commercial flexibility with a reduced environmental footprint, while providing a much-needed source of additional supply to key US allies and the global LNG market."

Kalpesh Patel, Co-Head of LNG Trading and a member of Gunvor's Executive Committee, commented, "This deal represents an important step in finalising the 0.5 mill tonnes out of our total of 2 mill tonne per annum arrangement with Chesapeake, while expanding our existing co-operation with Delfin.

"We continue to provide reliable and competitive logistics services to our partners by utilising our fleet consisting of vessels procured via term charters and equity ownership. Gunvor looks forward to establishing additional agreements with the companies in the near future," he said. ■

NEWS NUDGE

Höegh LNG's settles spat with FSRU charterer

With reference to the ongoing disputes and pending arbitrations with the charterer of PGN FSRU Lampung, Höegh LNG has announced that the parties have agreed an amicable settlement.

The parties have agreed to finally and irrevocably settle all disputes, claims and counterclaims that resulted in arbitration proceedings and agreed to terminate the cases with immediate effect.

PGN FSRU Lampung's charter contract remains in full force and each party will cover its own costs in relation to the terminated arbitrations, Höegh LNG said.

GTT wins large LNGCs' tank design

GTT has received an order from a Chinese shipyard for the tank design of eight new 271,000 cu m LNGCs.

The tanks will be fitted with the NO96 Super+ membrane containment system and the ships will be delivered between the second quarter of 2028 and the fourth quarter of 2029. ■

Grain to handle new imports

The UK's largest LNG terminal at Grain on the River Medway will be the recipient of more cargoes, following the signing of recent contracts.

First, the UK National Grid's Grain LNG and US-based Venture Global have signed a binding long-term terminal use agreement (TUA).

This will enable the regasification and sale of LNG from all of Venture Global's LNG terminals in Louisiana, including the planned CP2 LNG, subject to obtaining the necessary US federal permits.

Under the agreement, Venture Global will be able to access 3 mill tonnes per annum of LNG storage and regasification capacity at the Isle of Grain LNG receiving terminal for 16 years beginning in 2029, equivalent of up to 5% of average UK gas demand.

This is the second agreement from Grain LNG's competitive auction process, which was launched in September, 2023. The successful outcome of the auction further secures the future of Europe's largest LNG import terminal into the mid-2040s, the company claimed.

Currently undergoing a major expansion project, Grain LNG will soon have enough regasification capacity to handle about one third of the UK's gas demand, serving as a gateway to the UK energy market, as well as the wider European region.

Imports risen

The UK has recently seen a significant rise in LNG imports as Europe has diversified its LNG sources.

With volumes across its projects - Calcasieu Pass, Plaquemines LNG and CP2 LNG - this investment will boost Venture Global's status as a strategic supplier to Europe. To date, Venture Global has exported about 75% of its cargoes to Europe.

Katie Jackson, National Grid Ventures President, said: "I'm delighted that we are today able to announce the second result from our September auction, commencing a long term partnership with Venture Global.

"The UK has recently seen a significant rise in LNG imports as Europe has sought alternative energy sources. The addition of our first US customer further diversifies our supplier base, underpins UK consumers' energy security and guarantees the future of our world-class site out to 2045."

The UK's Isle of Grain terminal will receive more LNG

Mike Sabel, Venture Global CEO, added: "Venture Global is thrilled to announce our first investment in LNG infrastructure outside of the US, bolstering our ability to supply LNG from all our projects. The Grain LNG terminal is an important gateway to the broader European market, and we look forward to supplying the region through this new access point for years to come."

This agreement comes hard on the heels of a 10-year extension to Sonatrach's long-term storage and redelivery capacity at Grain, which will become effective in January, 2029.

This was the first agreement for 125 GWh/d of import capacity (equivalent to 3 mill tonnes per annum of LNG) from Grain LNG's auction process.

Grain will also receive 1 mill tonnes of LNG between 2025 and 2027 following a contract signed between Centrica Energy and Repsol.

This deal follows a 15 year, $8 bill contract with Delfin Midstream signed in July, 2023, a three-year supply agreement with Equinor that will heat 4.5 mill UK homes through 2024 and the reopening and expansion of the Rough gas storage facility in October, 2022 and June, 2023 respectively. ■

JBIC joins Sempra in energy transition

Sempra Infrastructure has signed a memorandum of understanding (MoU) with the Japan Bank for International Co-operation (JBIC) to co-operate on opportunities to advance the energy transition.

Through this MoU, Sempra Infrastructure and JBIC aim to develop further projects to improve the global energy supply chain through LNG, hydrogen and other de-carbonisation efforts in both the US and Japan.

"Sempra Infrastructure is thrilled to expand its collaboration with JBIC, as we look forward to advancing projects that lower the carbon intensity of our energy delivery assets in North America," said Justin Bird, Sempra Infrastructure CEO.

"We have built our relationships with customers and the export credit agencies in Japan over the past decade and are excited to expand our relationship with JBIC, as we continue developing projects in support of our net-zero business.

"This collaboration will help us continue advancing our mission of developing energy infrastructure that provides access to safe, secure and affordable energy to our global partners," he said.

Sempra companies have partnered with Japanese interests for half a century. More recently, this was illustrated by Sempra Infrastructure's Cameron LNG facility and recently announced strategic collaboration with a Japanese consortium, which calls for an evaluation of potential enhancements of the energy supply chain in support of de-carbonisation through e-natural gas as part of the ReaCH4 project.

In addition, the company is developing the Hackberry Carbon sequestration project, which will see the participation of two Japanese companies. Both development projects are in close geographical proximity to the Cameron LNG facility.

The US Department of Energy (DoE) and Japan's Ministry of Economy, Trade and Industry (MITI) are also currently implementing a memorandum of co-operation (MoC) for carbon capture, storage, conversion and recycling, and carbon dioxide removal.

The MoU with JBIC is intended to help Sempra Infrastructure and its customers in Japan meet many of the objectives of the MoC and helps support further efforts between the two countries to advance de-carbonisation efforts. ■

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Asian LNG re-exports continue to surpass Europe

Asian LNG re-exports have continued to outmatch those from Europe so far in 2024.

This maintains Asia's stronger re-export trend that emerged in 2023, according to data and analysts from S&P Global Commodity Insights.

Re-exports so far in 2024 from Asia and Europe totalled 530,000 tonnes, around 11% of the levels seen a year ago, according to the data.

Around 200,000 tonnes was re-exported from the Atlantic, while the rest came from Japan, South Korea, Taiwan and other Asian players.

Of this year's total thus far, 140,000 tonnes went to Japan, 120,000 tonnes to China, 110,000 tonnes to Finland, 80,000 tonnes to Thailand, 10,000 tonne to Italy and another 10,000 tonnes to Norway.

The remaining re-exports were still to be nominated.

From 2008 the data's startup, to 2022, re-exports from Europe outmatched those from Asia. However, in 2023 re-exports from the JKT region and other parts of Asia were higher and have maintained that trend so far this year.

European LNG re-export volumes have declined since the disruption to shipping in the Red Sea, as ships are avoiding the Suez Canal route linking Europe and Asia.

The longer route via the Cape of Good Hope has reduced the incentive for European volumes to head eastward.

Spain, the largest re-exporting country, usually sends cargoes to Asia but shipping constraints have kept cargoes inter-basin, reducing the arbitrage opportunity for re-exports, according to David Lewis, LNG analyst at S&P Global.

For example, shipments from Barcelona to Japan via the Cape of Good Hope could make the journey 20 days longer, costing an extra 62 cents per MMBtu on freight rates and additional boil-off, according to the shipping data.

Qatari alternative

Qatari cargoes could be an alternative to European re-exports, as these volumes hold a logistical advantage over US and European cargoes, as they don't need to go via the Suez Canal to Asia.

Last month, 12.6% of the JKM market's total LNG import was delivered from Qatar, according to S&P Global analysts.

"Asian re-exports reached 2.7 mill tonnes per year, marking a 46% year-on-year increase… Having declined in 2022, due to an unexpected increase in LNG demand, European re-exports rebounded by 27% in 2023 to 2.5 mill tonnes per year," Ayush Agarwal, LNG analyst at S&P Global, said in a 2024 LNG trade report.

"Mainland China emerged as the leading re-exporter in the Asia-Pacific region (1 mill tonnes), overtaking Indonesia. Indonesia (0.9 million tonnes) continued its strong re-export activities, driven by TotalEnergies' 2021 deal to use the Arun regasification terminal as a trading hub," Agarwal said.

He added that alongside the decline in Europe's share of global re-exports from over 50% in 2021 to 43% in 2023, their distribution had undergone significant changes.

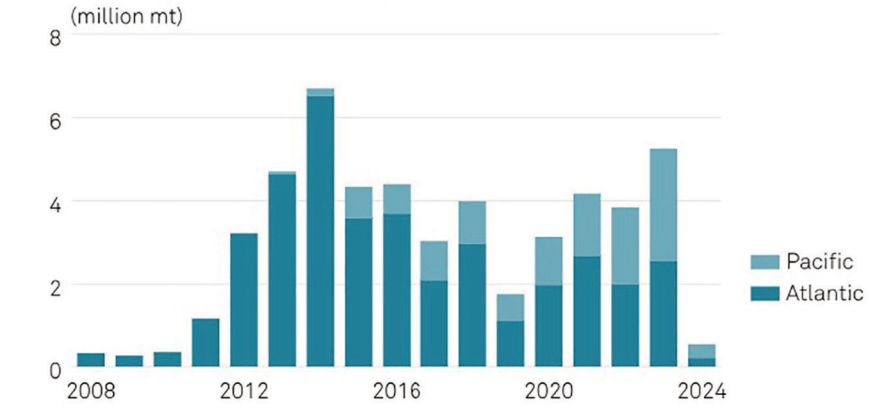
In 2022, around 73% of total European re-exports remained within the region; however, in 2023, this dropped to around 35% staying within Europe. Almost 38% of the exports were directed to other Asian markets, primarily to mainland China.

Re-exports from mainland China in 2023 nearly doubled year-on-year. An increase in term deliveries, combined with a slow recovery in demand from the lows of 2022 and a price-sensitive downstream market, led Chinese NOCs to rapidly increase re-exports within the basin.

Agarwal expected the growing trend of re-exports from China to continue to add flexibility and liquidity to trade in the Pacific Basin.

On 6th February, Platts, part of S&P Global, has assessed the March JKM at $9.459 per MMBtu and the JKM April derivatives at $9.510 per MMBtu. The Platts DES Northwest Europe Marker for March was assessed at $8.406 per MMBtu, up 21.5 cents per MMBtu on the day. ■

LNG re-exports by supply Basin



Source: S&P Global Commodity Insights

MOL FSRU earmarked for Polish project

Mitsui OSK Lines (MOL) has been chosen as the preferred shipowner to timecharter out an FSRU for a planned LNG import terminal in the Gulf of Gdańsk, Poland.

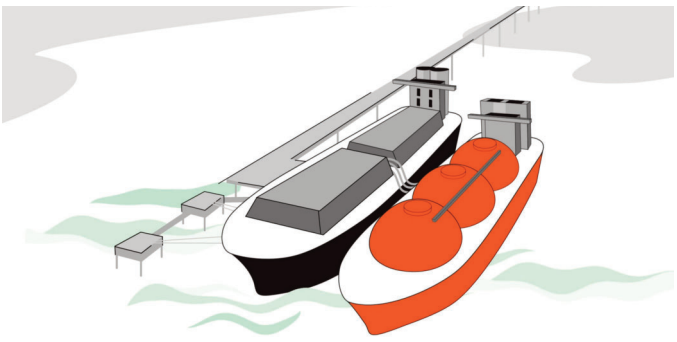
Polish gas transmission system operator, Gaz System is the project developer and operator behind this project.

This will be Poland's first FSRU and is a strategically important piece of energy infrastructure, which will enhance the country's energy security, MOL said.

The FSRU is due to be berthed at a mooring system about 3 km from the shore, between the mouths of the Vistula River branches - Śmiała and Martwa - in the Gdańsk area.

As part of the project, the necessary offshore and onshore infrastructure will also be built.

Commissioning of the complete terminal is scheduled for 2027/2028. ■



An impression of the Polish FSRU import terminal

Nebula buys into AG&P LNG - forms shipping company

Investment, development, and asset management company, Nebula Energy, has bought majority stake in LNG terminals and downstream infrastructure company, AG&P LNG (AG&P Terminals & Logistics Pte Ltd), a subsidiary of AG&P Group, for $300 mill.

Nebula has a particular focus on the LNG and carbon capture and storage (CCS) sectors and this latest move is intended to fast track LNG terminal developments across South and Southeast Asia.

With operational headquarters in the UAE, AG&P LNG will operate as an independent subsidiary of Nebula Energy with key offices in UAE, Singapore, India, Vietnam, and Indonesia.

Peter Gibson has been appointed Chairman, Sam Abdalla Vice Chairman, while Karthik Sathyamoorthy will continue as CEO of the company.

Sathyamoorthy said, "We are thrilled to welcome Nebula Energy as our main shareholder. The new equity will accelerate the deployment of the LNG infrastructure ecosystem for downstream markets through bridging the need for cost-effective LNG supply solutions, enabled by Nebula Energy, combined with our compelling techno-commercial solutions.

"With this partnership, AG&P LNG will singularly serve as the one-point integrated source for the rapid unlocking of near-term market demand. We are very privileged to work with Nebula Energy and make this clean energy available quickly and safely to the people across South and Southeast Asia," he said.

Gibson, who is also Chairman of Nebula Energy, said, "We are excited to participate in the future of AG&P LNG and to expedite the roll-out of these vital clean energy network, including LNG terminals, storage and transportation solutions and enable the cost-effective supply of this fuel.

The new Batangas Bay terminal

"This partnership comes at a time of a new cycle of LNG supply and growing demand for LNG in Asia markets where LNG is being increasingly recognised as the critical fuel to profoundly reduce carbon emissions.

"With AG&P LNG's presence across high-growth geographies, we look forward to rapidly unlocking these demand-centres and facilitating reliable LNG supply sources to match the demand growth.

"Furthermore, we are pleased to advise that Nebula Energy is establishing a shipowning company, Nebula Energy Shipping, where all marine assets will be owned and operated. This company will provide efficient and secure transportation services to support the expanding demand of our LNG business," he said.

AG&P LNG has a substantial growth portfolio of six LNG terminals under development with a planned total capacity of 25 mill tonnes per annum across several international projects.

The company is also the operator of the first LNG import and regasification terminal in the Philippines, the Philippines LNG (PHLNG) import terminal, located in Batangas Bay. ■

NEWS NUDGE

Russia to continue to supply SEFE

The Russian government has extended a permit to supply LNG to German state gas importer and trader, SEFE until 31st December, 2040.

The LNG will come from the Yamal LNG export plant, according to a government document published recently, reported Reuters.

SEFE (Securing Energy for Europe) was formerly the German division of Russia's Gazprom, which was nationalised in 2022, following the start of Russia's invasion of Ukraine.

Russia banned trade with a number of companies, including Gazprom Germania in 2022, but a year later the government made a special dispensation for the company to allow the LNG sales until the end of 2024.

This decision was published as Russia's largest LNG producer NOVATEK is facing sanctions and delays at its new Arctic LNG 2 project, Reuters reported.

Engineering news

TGE Gas Engineering has completed the Huizhou LNG receiving terminal EPC project.

TGE said that it had reached this important milestone 20 days earlier than the contract stipulated.

The project, consisting of three 200,000 cu m LNG storage tanks, plus related facilities, enables the loading and unloading of LNGCs ranging in size from 80,000 and 266,000 cu m.

The maximum annual LNG receiving capacity is 6.1 mill tonnes. It is planned to bring the terminal online by the middle of this year.

Elsewhere, Straatman is collaborating with Samsung Heavy Industries (SHI) on Petronas' new ZFLNG project.

The company will be supplying its SafeCom ship-to-shore link (SSL) to facilitate seamless communication between the ZFLNG facility and LNGCs.

ZFLNG will be located offshore near Sabah, Malaysia and will be Petronas' third FLNG project. ■

CPLP to become a major LNGC player

Soon to become a major LNGC player, Capital Product Partners (CPLP) reported net income for the fourth quarter of 2023 of $12.7 mill, compared with $21.1 mill for 4Q22.

Taking into account the interest attributable to the general partner and the allocation of net income to unvested units, net income per common unit for the quarter was $0.48, or $0.61 per common unit, if impairment charges on vessels are excluded, compared to net income per common unit of $1.03 for 4Q22.

Total 4Q23 revenue was $95.5 mill, compared to $79.9 mill during the corresponding quarter of 2022. This increase was primarily attributable to the contributions from the newbuildings acquired by the Partnership, offset by the sale of one vessel.

On 21st December, 2023, CPLP announced the closing of the umbrella agreement regarding the LNGC transaction, agreed on 13th November, 2023, with Capital Maritime and Capital GP to acquire 11 two-stroke (MEGA) 174,000 cu m LNGCs for a total price of $3,130 mill.

Upon the closing of this agreement, the Partnership entered into 11 share purchase agreements to acquire 100% of the equity interests in each vessel owning company.

Each vessel was built or is under construction at Hyundai Heavy Industries, or Hyundai Samho Heavy Industries.

On 21st December, 2023, and upon entry into the vessel SPAs for the LNGCs 'Axios II', 'Assos', 'Apostolos', 'Aktoras', 'Archimidis' and 'Agamemnon', CPLP paid a deposit of $174.4 mill, or 10% of the aggregate acquisition price of these initial vessels to Capital Maritime.

The 'Axios II' SPA was closed upon her delivery on 2nd January, 2024 and the remaining acquisitions of each vessel owning company is expected to be closed upon their delivery from Hyundai.

Upon the entry into the vessel SPAs for the remaining LNGCs 'Alcaios I'', 'Antaios I', 'Athlos' and 'Archon', the Partnership paid Capital Maritime $138.1 mill to acquire 100% of the equity interests in each of the vessel owning companies, which are due to be delivered to the Partnership between the third quarter of 2026 and the first quarter of 2027.

CPLP said it expected to pay an additional $909.9 mill to Hyundai in pre-delivery and delivery instalments for these vessels.

LNGCs funded

The balance for the acquisitions of the five initial vessels and the four remaining vessels will be funded by a combination of commercial debt, an unsecured seller's credit of up to $220 mill extended by Capital Maritime and maturing on 30th June, 2027, and cash on hand.

Following her delivery last December, 'Amore Mio I' has started a three-year employment with Qatar Energy Trading. Upon her acquisition, CPLP assumed a debt of $196.3 mill in the form of a sale and leaseback transaction, which has a tenure of 10 years, is repayable in 12 quarterly instalments of $5.5 mill and 28 subsequent instalments of $1.1 mill and offers the option to repurchase the vessel at a pre-determined price after the first anniversary of the arrangement, together with a purchase obligation of $98.2 mill at the expiration of the lease in October, 2033.

On 2nd January, 2024, the Partnership took delivery of the 'Axios II'. She commenced an index-linked, one-year timecharter, which will be followed by a seven-year bareboat charter with Bonny Gas Transport (BGT). BGT has an option to extend the charter by an additional three years.

Under the umbrella agreement, CPLP, Capital Maritime and the General Partner have agreed to negotiate and jointly work with tax and other advisors to agree terms for the conversion of the Partnership from a Marshall Islands limited partnership into a corporation with customary corporate governance provisions by 21st June, 2024. ■

NEWS NUDGE

Ships - Newbuildings

Qatar Gas Transport Co (NAKILAT) has announced that it has been chosen by QatarEnergy to be the owner and operator of up to 25 conventional size LNGCs under timecharters to be entered into by affiliates of both companies.

The 174,000 cu m LNGCs will be owned 100% by NAKILAT and chartered to affiliates of QatarEnergy.

They are scheduled for construction in South Korean shipyards as part of QatarEnergy's LNG fleet expansion project, aimed at catering for the LNG transport requirements of QatarEnergy's LNG expansion projects, as well as fleet renewals.

In addition, Samsung Heavy Industries (SHI) has won LNGC newbuilding contracts for Qatar's second-phase project worth Won4.6 trill ($2.5 bill), following HD Hyundai Heavy Industries' deal.

On 6th February, SHI announced that it had signed a contract to build 15 LNGCs with a Middle Eastern shipowner.

It is the largest single order in the company's history.

The Qatar project players initially ordered 65 ships in 2022, with Korean shipbuilders securing orders for 54 of them.

This second-phase order follows HD Hyundai Heavy Industries' agreement last October for a Won5.28 trill won deal to build 17 LNGCs.

Hanwha Ocean is thought to be in the final stages of price negotiations for another 12, South Korean media said.

NYK has signed a long-term charter contract with JERA for a new LNGC to be built by Hyundai Samho Heavy Industries.

She will be delivered in 2027 and will be used to transport LNG for the Japanese major.

The 174,000 cu m vessel will be fitted with an X-DF2.2 iCER dual-fuel, low-speed diesel engine that uses fuel oil and boil-off gas (BOG) for the main engine and a re-liquefaction system that can use surplus BOG effectively.

She will be the 11th LNGC that NYK has timechartered to JERA.

In the charter market, Cool Company (COOLCo) has announced that it has signed a timecharter agreement for one of its TFDE vessels.

The 12-month contract is with Santos Shipping Singapore and is scheduled to commence in the first quarter of this year.

In 3Q24, she is expected to undergo a scheduled drydocking, at which she will be upgraded to LNGe specifications, which includes the addition of reliquefaction capability via sub-coolers, as well as air lubrication systems and a range of optimisations and upgrades intended to enhance efficiency and reduce emissions.

In line with the anticipated enhanced performance profile following the upgrades, the charter includes a commercial mechanism to reward both the charterer and CoolCo.

As a result, CoolCo's management extended its total operating revenue guidance to $88-89 mill for 1Q24 ($99 mill 1Q23) and $84-85 mill for 2Q24 ($90 mill 2Q23), subject to no technical offhire.

The lower expected revenue range in 2Q24 is primarily related to off-hire during a scheduled drydocking of another vessel.

Hanwha Ocean recently held a launching ceremony for 'GasLog Italy' and 'Marvel Phoenix'.

The vessels are scheduled for delivery in August and September of this year, respectively. ■

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Flex LNG delivers predicted results

Flex LNG has reported vessel operating revenues of $97.2 mill for the fourth quarter 2023, compared to $94.6 mill for the previous quarter.

Net income was $19.4 mill and basic earnings per share were $0.36 for 4Q23, compared to $45.1 mill and $0.84, respectively for the third quarter.

The average 4Q23 TCE rate was $81,114 per day, compared to $79,207 per day in the previous quarter.

Adjusted EBITDA was $76.2 mill, compared to $74.7 mill for 3Q23, while adjusted net income was $37.8 mill, compared to $36.1 mill for the same period.

Last month, the 'Flex Constellation's' charterer said it will not declare the extension option under the timecharter. Following her re-delivery, she will undergo her five-year drydocking and will subsequently be marketed for both short and long-term contracts.

Also in January, the 'Flex Resolute's' charterer declared its first option, under the timecharter, to extend the firm period by another two years to the first quarter of 2027. Following this, the charterer has one additional two-year extension option, which if utilised, would extend the firm contract period to 1Q29.

Dividend declared

Flex LNG declared a dividend for 4Q23 of $0.75 per share, which is payable on or around 5th March, 2024 to shareholders, on record as of 23rd February, 2024.

Øystein Kalleklev, Flex LNG Management CEO, commented: "We are pleased that we have delivered on all our guidance measures for the year. We guided that our revenues would increase from $348 mill in 2022 to approximately $370 mill in 2023 and we delivered revenues of $371 mill in 2023, whilst revenues for the fourth quarter came in at $97.2 mill in line with quarterly guidance of $97-99 mill.

"The increase in revenues compared to 2022 was driven by higher time charter equivalent (TCE) rate for the fleet. We guided TCE rate of about $80,000 for the year and delivered TCE rate of $81,000 and $79,500 for the fourth quarter and the full year 2023, respectively.

"We also delivered on our guided adjusted EBITDA level. For the full year we ended up with an adjusted EBITDA of $290 mill, in line with guidance of $290 to $295 mill and ahead of the $272 mill we delivered in 2022.

"Lastly, we guided 80-100 days of docking days for our four scheduled drydockings with associated capex of $18-20 mill and we delivered this at 77 days and $21 mill, respectively. Hence, 2023 was in the context of deliverance on guidance pretty much plain sailing, so I would like to extend my gratitude to all personnel both at sea and onshore which contributed to our success.

"Over the next two years, we do see a somewhat more challenging freight market, as there are more ships for delivery compared to the expected new export volumes. Hence, we think Flex LNG is very well positioned, as we have 94% charter coverage for 2024 and 50 years minimum firm charter backlog, which may increase to 71 years if all charterer's options are extended.

"Additionally, our fleet consists entirely of large LNG carriers fitted with the most modern 2-stroke propulsion system resulting in significant fuel savings, compared to older generation tonnage. Reduced fuel consumption is also good for the environment and with EU Emission Trading System coming into force from 2024, this further enhances the premium, which our ships can achieve in the market given the costs associated with such carbon emissions.

"Lastly, we have a very strong balance sheet where all the LNG carriers are financed with attractive long-term debt while our cash balance at year-end was a comfortable $411 mill, giving us a high degree of financial flexibility.

"Given the above-mentioned factors, the Board has declared a quarterly dividend of $0.75 per share which calculates to a quarterly dividend payment of about $40 mill for our shareholders. For the four quarters of 2023, we have thus declared dividends of $3.125 per share which provides our investors with an attractive running yield of around 11% per annum," he concluded. ■

NEWS NUDGE

OLT Terminal to undergo maintenance

OLT Offshore LNG Toscana's FSRU terminal is to undergo maintenance at a shipyard, resulting in its shutdown.

This is scheduled from the beginning of April to the end of October, 2024.

Specifically, as a result of ongoing technical monitoring activities, the company has decided to carry out the replacement of the terminal's anchoring system bearing, designed and built to ensure the FSRUs rotation around the geostationary turret permanently anchored to the seabed.

Procedures are currently underway to schedule the suspension of operations and proceed with the bearing replacement work.

OLT has set up a control and monitoring system for the anchoring system, whereby, at present, conditions allow for the full operation of the terminal without any safety or environmental impact.

All change at Singapore LNG

Effective 7th April, 2024, Leong Wei Hung succeeded Tan Soo Koong as the CEO of Singapore LNG Corp (SLNG) upon the latter's retirement.

To allow for a period of transition, Leong assumed the role of CEO (Designate) of SLNG, on 1st February, 2024.

He has been a non-executive director of the SLNG Board since May, 2022 and in this capacity, he has been playing an important role in guiding SLNG's strategic directions.

Prior to this, he has had a career spanning more than 28 years with the Shell Group, where he served in various roles across several portfolios in refining, chemicals, trading and supply, based in Singapore and the UK.

He was also a board member of Shell Eastern Petroleum (Pte) Ltd and Shell Eastern Trading Limited, and served as advisor to several other companies.

Dunkerque LNG terminal offers regasification capacity

Dunkerque LNG has called for market interest (CMI) in booking up to 3,5 bill cu m per annum of regasification capacity.

Its shippers are benefiting from several distinct advantages, including no gas-in-kind, an ideal location in Northwestern Europe with a direct access to two gas markets, as well as a broad operational and commercial flexibility, the terminal operator claimed.

The qualification phase of the process started on 1st February and will close on 23rd February, 2024. ■

Seatrium secures LNGC repair and upgrade contracts

Singapore-based engineering, shipbuilding and shipepair company, Seatrium has signed favoured customer contracts (FCCs) with TMS Cardiff Gas, GasLog and Shell for the repair and upgrade of LNGCs.

Seatrium renewed its long-term FCC with GasLog LNG Services and Shell International Trading and Shipping Co (STASCO) to provide shiprepairs, refurbishment and upgrading for their LNGCs from 2024 to 2029, with an option for further renewal.

The FCC involves the repairs, refurbishment and upgrading of the two entities' combined fleet of 43 LNGCs docking at Seatrium Repairs and Upgrades, a wholly-owned subsidiary of the Group.

It also supports joint planning, information and experience sharing, leveraging complementary resources of the Group to achieve sustainable targets in HSE (Health, Safety and Environment), quality, cost efficiency and timely deliveries.

Kostas Karathanos, GasLog LNG Services COO, said, "We are delighted to renew our favoured customer agreement for another five years. We have enjoyed many years of partnership to refit the majority of our fleet here and trusted Seatrium in the conversion of our FSRU.

"The recent tender we jointly ran with STASCO indicates that Seatrium remains a competitive shipyard offering high quality services. This aligns with our strategic direction of optimising costs and leveraging our competitiveness. We look forward to strengthening our relationship as we work towards safe, timely and on-budget deliveries for the conversions, repairs and upgrades of our LNG carriers," he said.

Alvin Gan, Seatrium's Executive Vice President, Repairs and Upgrades, added: "We are honoured and delighted to have our exclusive partnership agreement renewed with both GasLog and STASCO.

"Partnering with world-class vessel owners increases our market share of LNG repairs and upgrades and enhances our capabilities as a world-class shipyard group. The selection of Seatrium as the LNG refit partner in Singapore is a major boost to Singapore's status as a major global hub," he said.

Another LNGC FCC

In addition, Seatrium recently signed an FCC with TMS Cardifft for the refit of 17 LNGCs in Singapore, with responsibilities in joint planning, information and experience sharing.

Both companies will also jointly work towards achieving sustainable targets in the areas of Quality, Health, Safety and Environment (QHSE), cost efficiency and timely deliveries, which are key indicators of high-quality LNG refit maintenance.

"Seatrium is dedicated to delivering high-quality, eco-friendly services with a strong focus on QHSE standards that uphold a healthy and safe working environment for our employees while also reducing our environmental footprint.

"This strategic partnership is a testament to our ongoing efforts to build strong collaborations with major LNG owners, such as TMS Cardiff Gas, to further strengthen our market leadership and achieve our vision for a sustainable future," Gan said.

At the end of last month, Seatrium delivered the 'Brassavola', Singapore's first membrane LNG bunker vessel built locally by the Group, to owner Indah Singa Maritime, a wholly-owned subsidiary of Mitsui OS Lines (MOL).

Following her delivery, 'Brassavola' will be chartered by Pavilion Energy to supply LNG as a bunker furl in the Port of Singapore.

Expected to commence operations in February, 2024, she will also be deployed by TotalEnergies Marine Fuels to serve its customers under a long-term agreement with Pavilion Energy.

Her construction was based on a proprietary design by LMG Marin, a wholly-owned subsidiary of Seatrium. ■

NEWS NUDGE

Mayer Brown advises Excelerate

Law firm Mayer Brown has advised long-term client Excelerate Energy in connection with a 15-year LNG sale and purchase agreement (SPA) with QatarEnergy.

Under this SPA, Excelerate agreed to purchase LNG on a delivered ex ship (DES) basis from QatarEnergy for 15 years.

Excelerate will purchase 0.85 mill tonnes per annum of LNG in 2026 and 2027 and ramp up to 1 mill tonnes from 2028 to 2040.

The LNG is intended to supply Bangladesh FSRUs. Excelerate operates the Moheshkhali LNG FSRU terminal and a second FSRU terminal in the Bay of Bengal.

The US-based company is responsible for around 25% of Bangladesh's natural gas supply.

Nick Kouvaritakis, global head of LNG at Mayer Brown, commented: "We are delighted to have advised Excelerate on its landmark LNG supply agreement with QatarEnergy.

"Excelerate is a key energy client of the firm and we are delighted to have supported Excelerate on this significant supply deal with the world's largest LNG supplier, QatarEnergy," he said.

The Singapore-based team was led by Partner, Nick Kouvaritakis and included Partner, Sean Prior, Counsel, Nick Kendrick, and Senior Associate, Shi Ning Ong. ■

Monthly Large LNGC Values*

Newbuildings (174,000 cu m)	$251.80 mill
Five years old (174,000 cu m)	$216.36 mill
Total Fleet (583 ships)	$91.48 bill
Orderbook (355 ships)	$91.61 bill

Source: VesselsValue (30/01/24)

**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	$43,000	+$500
West of Suez	$40,000	-
12 mos T/C	$54,000	-

**Since last report (01/02/24)* *Source: Fearnleys (14/02/24)*

LNGC environmental output study concluded

A six-month life cycle assessment (LCA) study, involving Lloyd's Register (LR), Knutsen, HDKSOE and Hyundai Heavy Industries (HHI) has concluded.

The study highlighted the environmental output at each stage of a newbuilding 174,000 cu m LNGC's lifecycle.

Alternative fuels, green steel and renewable energy were fundamental to greenhouse gas (GHG) emissions reduction during the vessel's lifecycle, the study, which was carried out as a joint development project (JDP), revealed.

The study began in June, 2023, with the aim of measuring the carbon emissions generated throughout the LNGC's entire lifecycle, from cradle (raw material extraction) to gate (shipbuilding), gate to end-of-life (operation), and end-of-life and to grave (demolition, recycling, and waste disposal).

Research carried out as part of the JDP revealed that the majority of emissions are created during the operational period of a vessel's life cycle, but that these can be reduced by around 90% through the use of zero- or low-carbon fuels.

Of the overall operations figure, 79% of GHG emissions are generated through ship operations (tank-to-wake), with 21% attributed to mining and transport (well-to-tank) of the fuels, highlighting the significant positive impact of low- or zero-carbon fuels on emissions reduction.

The study also revealed that GHG emissions during the shipbuilding stage (gate) can be significantly reduced if green steel – steel with low or zero GHG emissions embodied at the manufacturing stage – is introduced into the process. Renewable energy usage could also lead to a GHG emissions reduction of about 60% at the yard level.

The study took into account all emissions (Scope 1, 2 and 3) associated with the vessel throughout its life cycle.

All three scopes

Scope 1 emissions are the direct emissions created during shipbuilding and operation, Scope 2 emissions are indirect emissions related to energy, water and steam, for example powering the yard during the build, while Scope 3 emissions encompass indirect emissions created both upstream (supply chain) and downstream (distribution chain), for example, emissions created during production, transport and storage of materials and equipment, and during the vessel recycling process.

By incorporating all three scopes, a complete emissions profile over a vessel's lifecycle can be obtained, LR said.

LR's CCO, Andy McKeran, said: "Lloyd's Register is delighted to be part of this JDP study, which is an industry first for shipping. The IMO regulations are progressively evolving to encompass the entire value chain and Scope 3 emissions disclosures are gaining traction.

"The methodology created and tested as part of the study will provide a baseline for all life stages of a new construction vessel and serve as a benchmark for comparing the life cycle emissions of other LNG carriers.

"LR is seeing strong demand for LCA assessments, with leading shipowners keen to identify the most impactful measures to reduce their environmental footprint, and charterers looking to minimise their Scope 3 emissions," he said.

Knutsen's Director of Newbuilding and Innovation. Jarle Østenstad, added: "We are delighted to announce that our collaboration with HDKSOE and LR has yielded significant results in the life cycle assessment (LCA) of the LNG-fuelled LNG carrier.

"In preparation for the forthcoming EU Corporate Social Responsibility Directive (CSRD), and other similar regulations across the globe, shipowners will be required to produce sustainability reports disclosing their Scope 3 emissions and outline strategies for mitigation.

"This LCA analysis brings owners one step closer to meeting these requirements," he said. ■

DNV endorses new LNGC propulsion solution

DNV has quantified the gains that LNGC owners could expect to achieve using the new dual fuel, electric+ (DFE+) solution developed by ABB and MAN Energy Solutions.

Comprising MAN's 4-stroke 49/60DF dual fuel engine and ABB's dynamic AC power distribution and control system, the solution has been developed to overcome efficiency challenges that are specific to LNGCs.

DNV's Maritime Advisory assessment concluded that the DFE+ concept is a competitive and more energy efficient alternative to even the most efficient conventional dual-fuel LNGC propulsion designs.

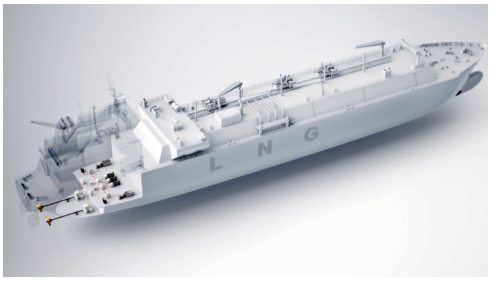
Smaller machinery space requirements could deliver a conservative estimate of 5% greater cargo capacity. Combined with other steps to optimise performance, the DFE+ concept could contribute to overall energy savings of 6 – 7.5%, considering the ship's increased shipments, DNV said.

From 1st January, 2023 the IMO has required shipowners to report vessels into an Energy Efficiency Design Index (EEDI), an Energy Efficiency Existing Ships Index (EEXI) and an operational Carbon Intensity Index (CII).

These tools benchmark ships to enable owners to know what they need to do to meet IMO targets for reducing greenhouse gas emissions (GHG).

As the latest addition to MAN's 4-stroke portfolio, the MAN 49/60DF engine is optimised for LNG. It is also highly compatible with ABB's dynamic AC system, which combines the merits of conventional AC with those of variable frequency to allow the engines to operate on optimal speeds – significantly improving total fuel consumption.

"Owners of LNG carriers face specific challenges in complying with the regulations, given their reliance on propulsion solutions with limited potential for efficiency gains," said Prof George Dimopoulos, Scientific Advisor, DNV. "The ABB – MAN propulsion concept aims to offer a highly effective way for LNG carriers to meet progressively tightening emissions regulations while also reducing fuel costs."



DNV has given the green light to ABB and MAN's propulsion system

"With the current global orderbook for LNG carriers and emission regulations continuing to tighten, owners need new technologies to meet the requirements that apply to this specific class of ships," explained Rune Lysebo, Strategic Market Development, ABB Marine & Ports. "DNV's testimony on the gains available to LNG carriers with the new solution developed by ABB and MAN Energy Solutions proves the time is right to explore the next-generation technologies for this vessel type."

DFE+ could be installed with an energy storage solution to operate as a spinning reserve or be coupled with ABB's Azipod® electric propulsion.

ABB and MAN will also explore integrating fuel cells as the technology matures, the companies said. ■

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WORLD LNG CARRIER ORDERBOOK

Name	Propulsion	Capacity	Ordered	Delivery	Owners	Yard
Daewoo 2531	MEGI	174000	2021-11-01	2025-05-01	BWGas	Hanwha Ocean
Daewoo 2530	MEGI	174000	2021-11-01	2025-03-01	BWGas	Hanwha Ocean
Hudong-zhonghua H1900a	XDF	174000	2023-06-01	2028-03-01	COSCO, MOL, ENN	Hudong-Zhonghua
Hudong-zhonghua H1899a	XDF	174000	2023-06-01	2027-12-01	COSCO, MOL, ENN	Hudong-Zhonghua
Hudong-zhonghua H1898a	XDF	174000	2023-06-01	2027-10-01	COSCO, MOL, ENN	Hudong-Zhonghua
Hudong-zhonghua H1891a	XDF	174000	2023-06-01	2027-10-01	NYK	Hudong-Zhonghua
Hd Hyundai Ulsan 3443		174000	2023-04-28	2027-08-01	NYK	Hyundai Heavy
Dalian No 1 G175k-13		175000	2023-08-21	2027-07-01	Wah Kwong, China Gas, CSSC	Dalian Shipbuilding
Hd Hyundai Ulsan 3442		174000	2023-04-28	2027-06-01	NYK	Hyundai Heavy
Hd Hyundai Ulsan 3441		174000	2023-04-28	2027-03-01	NYK	Hyundai Heavy
Hanwha Ocean 2584	ME-GA	174000	2023-08-01	2027-01-31	MOL	Hanwha Ocean
Dalian No 1 G175k-12		175000	2023-08-21	2027-01-01	Wah Kwong, China Gas, CSSC	Dalian Shipbuilding
Samsung 2663	ME-GA	174000	2023-01-20	2027-01-01	MOL	Samsung
Daewoo 2575	MEGI	200000	2023-03-01	2026-12-01	Venture Global LNG	Hanwha Ocean
Hudong-zhonghua H1888a	XDF	174000	2023-06-01	2026-12-01	NYK	Hudong-Zhonghua
Samsung 2665	ME-GA	174000	2023-03-31	2026-11-01	K-Line	Samsung
Hudong-zhonghua H1887a	XDF	174000	2023-06-01	2026-10-01	NYK	Hudong-Zhonghua
Samsung 2662	ME-GA	174000	2023-01-20	2026-09-01	MOL	Samsung
Daewoo 2574	MEGI	200000	2023-03-01	2026-09-01	Venture Global LNG	Hanwha Ocean
Samsung 2664	ME-GA	174000	2023-03-31	2026-08-01	K-Line	Samsung
Hudong-zhonghua H1886a	XDF	174000	2023-06-01	2026-08-01	NYK	Hudong-Zhonghua
Hudong-zhonghua H1909a	XDF	174000	2023-06-01	2025-12-01	ULT	Hudong-Zhonghua
Hudong-zhonghua H1908a	XDF	174000	2023-06-01	2025-11-01	ULT	Hudong-Zhonghua
China Merchants Jiangsu Cmhi-282-01	ME-GA	180000	2023-05-01	2026-03-01	Celsius Shipping	China Merchants HI Jiangsu
China Merchants Jiangsu Cmhi-282-02	ME-GA	180000	2023-05-01	2026-07-01	Celsius Shipping	China Merchants HI Jiangsu
China Merchants Jiangsu Cmhi-282-03	ME-GA	180000	2023-05-01	2026-11-01	Celsius Shipping	China Merchants HI Jiangsu
China Merchants Jiangsu Cmhi-282-04	ME-GA	180000	2023-05-01	2027-03-01	Celsius Shipping	China Merchants HI Jiangsu
Samsung 2687		174000	2023-11-01	2026-09-01	MOL	Samsung
Hd Hyundai Ulsan 3453	XDF	200000	2023-04-01	2027-07-01	Dynagas	Hyundai Heavy
Hyundai Ulsan 3435	XDF	200000	2023-01-01	2026-07-01	Dynagas	Hyundai Heavy
Hyundai Ulsan 3434	XDF	200000	2023-01-01	2026-04-01	Dynagas	Hyundai Heavy
Hyundai Ulsan 3433	XDF	200000	2023-01-01	2025-12-01	Dynagas	Hyundai Heavy
Daewoo 2559	ME-GA	174000	2022-06-01	2025-02-01	SK Shipping, Pan Ocean, H-Line	Hanwha Ocean
Hyundai Ulsan 3394	XDF	174000	2022-07-01	2025-12-01	Knutsen	Hyundai Heavy
Hyundai Ulsan 3393	XDF	174000	2022-07-01	2025-12-01	Knutsen	Hyundai Heavy
Hyundai Ulsan 3386	XDF	174000	2022-07-01	2025-08-01	Knutsen	Hyundai Heavy
Daewoo 2533	MEGI	174000	2022-01-01	2024-09-01	GasLog	Hanwha Ocean
North Mountain	XDF	174000	2021-10-01	2023-12-01	NYK	Samsung
Samsung 2579	ME-GA	180000	2021-07-01	2024-03-01	Celsius Shipping	Samsung
Ignacy Lukasiewicz	ME-GA	174000	2021-07-01	2024-03-01	Knutsen	Hyundai Samho
Energy Fortitude	XDF	174000	2021-07-01	2024-04-01	Alpha Gas	Hyundai Samho
Samsung 2461	ME-GA	180000	2021-07-01	2023-12-01	Celsius Shipping	Samsung
Nikolay Basov	TFDE - Azipod	172500	2020-08-01	2024-03-01	MOL, COSCO	Hanwha Ocean
Lev Landau	TFDE - Azipod	172500	2020-08-01	2024-01-01	Hanwha Ocean	Hanwha Ocean
Zhores Alferov	TFDE - Azipod	172500	2020-08-01	2024-03-01	Hanwha Ocean	Hanwha Ocean
Ilya Mechnikov	TFDE - Azipod	172500	2020-08-01	2024-03-01	MOL, COSCO	Hanwha Ocean

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 = 30 November 2023

Name	Propulsion	Capacity	Ordered	Delivery	Owners	Yard
Pyotr Kapitsa	TFDE - Azipod	172500	2020-08-01	2024-01-01	Hanwha Ocean	Hanwha Ocean
Marvel Dove	ME-GA	174000	2022-01-01	2024-09-01	SK Shipping	Hyundai Samho
Marseille Knutsen	ME-GA	174000	2021-07-01	2025-09-01	Knutsen	Hyundai Samho
Emei	XDF	174000	2021-12-01	2024-09-01	ULT	Hudong-Zhonghua
Orion Sinead	XDF	174000	2020-12-01	2024-11-01	JP Morgan	Hyundai Heavy
HHI Nov 1		174000	2023-11-14	2027-11-30	Evalend Shipping	Hyundai Heavy
HHI Nov 2		174000	2023-11-14	2028-01-31	Evalend Shipping	Hyundai Heavy
DALIAN NO 1 G175K-6	XDF	175000	2023-03-01	2026-10-01	China Merchant	Dalian Shipbuilding
DALIAN NO 1 G175K-5	XDF	175000	2023-03-01	2026-08-01	China Merchant	Dalian Shipbuilding
JIANGSU YANGZI XINFU	ME-GA	175000	2022-10-01	2025-11-01	Hammonia Reederei	Yangzijiang YZJ2022-1475
JIANGSU YANGZI XINFU	ME-GA	175000	2022-10-01	2026-05-01	Hammonia Reederei	Yangzijiang YZJ2022-1476
Lng Ping Hu	XDF	78900	2023-07-01	2024-12-31	Zhejiang Huaxiang	Jiangsu Yixiang
Shandong 1		175000	2023-03-01	2027-03-01	ADS, AES Panama LNG	Jiangnan
Samsung 2609	ME-GA	174000	2022-02-01	2025-06-01	H-Line	Samsung
Samsung 2608	ME-GA	174000	2022-02-01	2025-05-01	H-Line	Samsung
Samsung 2610	ME-GA	174000	2022-02-01	2025-09-01	H-Line	Samsung
Hudong-zhonghua H1882a	XDF	174000	2022-01-01	2025-10-01	MOL	Hudong-Zhonghua
Samsung 2592		174000	2021-10-01	2024-03-01	JP Morgan	Samsung
Celsius 6	ME-GA	180000	2023-10-24	2027-09-01	Celsius Shipping	China Merchants HI Jiangsu
Celsius 5	ME-GA	180000	2023-10-24	2027-06-01	Celsius Shipping	China Merchants HI Jiangsu
Coral Evolution	XDF	29400	2021-06-01	2023-12-01	Anthony Veder	Hyundai Mipo
Hd Hyundai Ulsan 3454	XDF	174000	2023-08-02	2026-12-01	Evalend Shipping	Hyundai Heavy
Hd Hyundai Ulsan 3455	XDF	174000	2023-08-02	2027-06-30	Evalend Shipping	Hyundai Heavy
MOL Coral	ME-GA	174000	2021-06-01	2024-01-01	MOL	Hanwha Ocean
Daewoo 2521	MEGI	174000	2021-05-01	2024-01-01	Hyundai LNG Shipping	Hanwha Ocean
Hudong-zhonghua H1889a	XDF	174000	2022-04-01	2027-03-01	NYK	Hudong-Zhonghua
Hudong-zhonghua H1890a	XDF	174000	2022-04-01	2027-05-01	NYK	Hudong-Zhonghua
Hudong-zhonghua H1903a	XDF	174000	2023-05-01	2028-12-01	CSSC	Hudong-Zhonghua
Hudong-zhonghua H1902a	XDF	174000	2023-05-01	2028-09-01	CSSC	Hudong-Zhonghua
Hudong-zhonghua H1901a	XDF	174000	2023-05-01	2028-05-31	CSSC	Hudong-Zhonghua
Hd Hyundai Ulsan 3444		174000	2023-05-01	2027-08-31	NYK	Hyundai Heavy
Cosco 3		175000	2023-08-31	2028-04-01	COSCO	Dalian Shipbuilding
Cosco 2		175000	2023-08-31	2027-06-01	COSCO	Dalian Shipbuilding
HANWHA OCEAN 2582	MEGI	174000	2023-04-01	2027-06-01	Maran Gas Maritime	Hanwha Ocean
Cosco 1		175000	2023-08-31	2027-03-01	COSCO	Dalian Shipbuilding
Samsung 2584	ME-GA	180000	2021-08-01	2027-02-01	Celsius Shipping	Samsung
Daewoo 2573	ME-GA	174000	2022-09-01	2026-07-01	TMS Cardiff Gas	Hanwha Ocean
Daewoo 2572	ME-GA	174000	2022-09-01	2026-04-01	TMS Cardiff Gas	Hanwha Ocean
Samsung 2640	ME-GA	174000	2022-09-01	2025-10-01	JP Morgan	Samsung
Daewoo 2535	MEGI	174000	2022-01-01	2025-09-01	GasLog	Hanwha Ocean
Kool Panther	ME-GA	174000	2022-06-01	2024-12-01	Cool Co	Hyundai Samho
Kool Tiger	ME-GA	174000	2022-06-01	2024-08-31	Cool Co	Hyundai Samho
Daewoo 2532	MEGI	174000	2022-01-01	2024-07-01	GasLog	Hanwha Ocean
Pyotr Stolypin	TFDE - Azipod	172600	2019-09-01	2024-06-01	Smart LNG	Zvezda SSK
Pacific Success	XDF	173400	2019-12-01	2024-03-01	SinoKor	Samsung
Samsung 2669		174000	2023-06-01	2028-02-01	Chevron	Samsung
Samsung 2668		174000	2023-06-01	2027-12-01	Chevron	Samsung
Hyundai Samho 8210	XDF	174000	2023-02-01	2027-12-01	NYK	Hyundai Samho
Hanwha Ocean 2583	ME-GA	174000	2023-04-01	2027-08-01	MOL	Hanwha Ocean
Hyundai Samho 8209	XDF	174000	2023-02-01	2027-07-01	NYK	Hyundai Samho
Archon	ME-GA	174000	2023-03-01	2027-03-01	Capital Gas	Hyundai Samho

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Data last updated = 30 November 2023

Name	Propulsion	Capacity	Ordered	Delivery	Owners	Yard
Hanwha Ocean 2580	ME-GA	174000	2023-02-01	2027-03-01	MOL	Hanwha Ocean
Athlos	ME-GA	174000	2023-03-01	2027-02-01	Capital Gas	Hyundai Samho
Hyundai Samho 8208	XDF	174000	2023-02-01	2026-12-01	NYK	Hyundai Samho
Antaios I	ME-GA	174000	2023-01-01	2026-11-01	Capital Gas	Hyundai Samho
Alcaios I	ME-GA	174000	2023-01-01	2026-09-01	Capital Gas	Hyundai Samho
Nikolay Semenov	TFDE - Azipod	172500	2020-08-01	2026-05-01	MOL, COSCO	Hanwha Ocean
Energy Endurance	XDF	174000	2021-07-01	2024-03-01	Alpha Gas	Hyundai Samho
Hyundai Samho 8189	ME-GA	174000	2022-05-01	2025-08-01	SK Shipping	Hyundai Samho
HYUNDAI SAMHO 8239	XDF	174000	2023-02-01	2027-10-01	NYK	Hyundai Samho
HYUNDAI SAMHO 8238	XDF	174000	2023-02-01	2027-05-01	NYK	Hyundai Samho
DAEWOO 2558	ME-GA	174000	2022-09-01	2026-09-01	MOL	Hanwha Ocean
Daewoo 2527	ME-GA	174000	2021-10-01	2024-07-01	MOL	Hanwha Ocean
HANWHA OCEAN 2581	MEGI	174000	2023-04-01	2027-04-01	Maran Gas Maritime	Hanwha Ocean
Samsung 2318	ME-GA	173400	2019-12-01	2027-06-01	SinoKor	Samsung
Samsung 2316	ME-GA	173400	2019-12-01	2026-12-01	SinoKor	Samsung
Samsung 2317	ME-GA	173400	2019-12-01	2027-03-01	SinoKor	Samsung
Agamemnon	ME-GA	174000	2022-06-01	2026-03-01	Capital Gas	Hyundai Samho
Shandong 2		175000	2023-03-01	2027-07-01	Shandong Marine	Jiangnan
Archimidis	ME-GA	174000	2022-06-01	2026-01-01	Capital Gas	Hyundai Samho
Aktoras	ME-GA	174000	2021-09-01	2024-07-01	Capital Gas	Hyundai Samho
Hyundai Samho 8179	ME-GA	174000	2022-03-01	2025-03-01	Knutsen	Hyundai Samho
Daewoo 2542	ME-GA	200000	2022-03-01	2025-10-01	Venture Global LNG	Hanwha Ocean
Daewoo 2541	ME-GA	200000	2022-03-01	2025-07-01	Venture Global LNG	Hanwha Ocean
Samsung 2659	ME-GA	174000	2022-11-01	2027-09-01	Seapeak	Samsung
HUDONG-ZHONGHUA H1796A	XDF	174000	2022-09-01	2027-12-01	MOL	Hudong-Zhonghua
Samsung 2660	ME-GA	174000	2022-11-01	2027-12-01	Seapeak	Samsung
HUDONG-ZHONGHUA H1795A	XDF	174000	2022-09-01	2027-07-01	MOL	Hudong-Zhonghua
Samsung 2658	ME-GA	174000	2022-11-01	2027-08-01	Seapeak	Samsung
HUDONG-ZHONGHUA H1794A	XDF	174000	2022-09-01	2027-02-01	MOL	Hudong-Zhonghua
Samsung 2656	ME-GA	174000	2022-11-01	2027-03-01	Seapeak	Samsung
Samsung 2657	ME-GA	174000	2022-11-01	2027-05-01	Seapeak	Samsung
Hd Hyundai Ulsan 3452	XDF	200000	2023-04-01	2027-05-01	Dynagas	Hyundai Heavy
Hudong-zhonghua H1897a	XDF	174000	2022-09-01	2027-06-01	K-Line	Hudong-Zhonghua
Samsung 2647	ME-GA	174000	2022-06-01	2026-08-01	JP Morgan	Samsung
Daewoo 2543	ME-GA	200000	2022-03-01	2025-12-01	Venture Global LNG	Hanwha Ocean
Hyundai Ulsan 3399	XDF	174000	2022-08-01	2026-09-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hyundai Heavy
Hudong-zhonghua H1894a	XDF	174000	2022-09-01	2026-10-01	K-Line	Hudong-Zhonghua
Hudong-zhonghua H1895a	XDF	174000	2022-09-01	2026-12-01	K-Line	Hudong-Zhonghua
Hyundai Ulsan 3400	XDF	174000	2022-08-01	2026-12-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hyundai Heavy
Hyundai Ulsan 3401	XDF	174000	2022-08-01	2026-12-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hyundai Heavy
Samsung 2636	ME-GA	174000	2022-04-01	2026-03-01	TMS Cardiff Gas	Samsung
HUDONG-ZHONGHUA H1893A	XDF	174000	2022-07-01	2026-03-01	COSCO	Hudong-Zhonghua
Samsung 2644	ME-GA	174000	2022-06-01	2026-05-01	JP Morgan	Samsung
Hudong-zhonghua H1800a	XDF	174000	2022-09-01	2026-05-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hudong-Zhonghua
Hyundai Samho 8204		174000	2023-01-01	2026-05-01	Oman Shipping Co.	Hyundai Samho
Hudong-zhonghua H1884a	XDF	174000	2022-01-01	2026-06-01	MOL	Hudong-Zhonghua
Samsung 2645	ME-GA	174000	2022-06-01	2026-06-01	JP Morgan	Samsung
Hyundai Samho 8205		174000	2023-01-01	2026-06-01	Oman Shipping Co.	Hyundai Samho

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Data last updated = 30 November 2023

Name	Propulsion	Capacity	Ordered	Delivery	Owners	Yard
Samsung 2646	ME-GA	174000	2022-06-01	2026-07-01	JP Morgan	Samsung
Hyundai Ulsan 3398	XDF	174000	2022-08-01	2026-07-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hyundai Heavy
Hudong-zhonghua H1801a	XDF	174000	2022-09-01	2026-07-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hudong-Zhonghua
Samsung 2641	ME-GA	174000	2022-06-01	2025-11-01	JP Morgan	Samsung
Dalian No 1 G175k-3	XDF	175000	2022-09-01	2025-11-01	China Merchant	Dalian Shipbuilding
Hudong-zhonghua H1798a	XDF	174000	2022-09-01	2025-11-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hudong-Zhonghua
Clean Srocco	ME-GA	200000	2022-03-01	2025-12-01	Dynagas	Hyundai Heavy
Hyundai Ulsan 3396	XDF	174000	2022-08-01	2025-12-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hyundai Heavy
Samsung 2642	ME-GA	174000	2022-06-01	2026-01-01	JP Morgan	Samsung
Clean Destiny	ME-GA	200000	2021-05-01	2023-11-01	Dynagas	Hyundai Heavy
Puteri Sejinjang	XDF	174000	2021-04-01	2024-07-01	Hyundai LNG Shipping	Hyundai Heavy
Dalian No 1 G175k-4	XDF	175000	2022-09-01	2026-01-01	China Merchant	Dalian Shipbuilding
Hyundai Ulsan 3397	XDF	174000	2022-08-01	2026-01-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hyundai Heavy
Samsung 2643	ME-GA	174000	2022-06-01	2026-02-01	JP Morgan	Samsung
Hudong-zhonghua H1799a	XDF	174000	2022-09-01	2026-02-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hudong-Zhonghua
Samsung 2652	ME-GA	174000	2022-11-01	2026-02-01	Minerva Marine	Samsung
Hudong-zhonghua H1883a	XDF	174000	2022-01-01	2026-03-01	MOL	Hudong-Zhonghua
HUDONG-ZHONGHUA H1892A	XDF	174000	2022-07-01	2025-10-01	COSCO	Hudong-Zhonghua
Hyundai Ulsan 3395	XDF	174000	2022-08-01	2025-08-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hyundai Heavy
Samsung 2638	ME-GA	174000	2022-06-01	2025-08-01	JP Morgan	Samsung
Hudong-zhonghua H1790a	XDF	175000	2021-10-01	2024-09-01	MOL	Hudong-Zhonghua
Hudong-zhonghua H1896a	XDF	174000	2022-09-01	2027-03-01	K-Line	Hudong-Zhonghua
Orion Gaugin	ME-GA	174000	2021-07-01	2025-09-01	JP Morgan	Hyundai Heavy
Samsung 2639	ME-GA	174000	2022-09-01	2025-09-01	JP Morgan	Samsung
Hudong-zhonghua H1797a	XDF	174000	2022-09-01	2025-09-01	NYK, MISC, K-Line, China LNG Shipping Holdings	Hudong-Zhonghua
Samsung 2611	ME-GA	174000	2022-09-01	2025-01-01	Pan Ocean, SK Shipping, H-Line	Samsung
Samsung 2619	ME-GA	180000	2022-03-01	2025-10-01	Celsius Shipping	Samsung
Hyundai Samho 8174	XDF	174000	2022-08-01	2025-10-01	NYK	Hyundai Samho
Hyundai Ulsan 3370	ME-GA	174000	2022-05-01	2025-02-01	SK Shipping	Hyundai Heavy
Hyundai Samho 8188	ME-GA	174000	2022-05-01	2025-07-01	SK Shipping	Hyundai Samho
Orion Hugo	ME-GA	174000	2021-07-01	2025-07-01	JP Morgan	Hyundai Heavy
Hyundai Samho 8180	ME-GA	174000	2022-03-01	2025-06-01	Knutsen	Hyundai Samho
Hyundai Ulsan 3381	XDF	174000	2022-06-01	2025-06-01	Knutsen	Hyundai Heavy
Samsung 2634	ME-GA	174000	2022-06-01	2025-05-01	JP Morgan	Samsung
Samsung 2599	ME-GA	180000	2021-12-01	2025-05-01	Celsius Shipping	Samsung
Hyundai Ulsan 3380	XDF	174000	2022-06-01	2025-05-01	Knutsen	Hyundai Heavy
Hudong-zhonghua H1793a	XDF	175000	2021-10-01	2025-05-01	MOL	Hudong-Zhonghua
Hyundai Samho 8175	XDF	174000	2022-01-01	2025-04-01	H-Line	Hyundai Samho
Clean Levant	ME-GA	200000	2022-03-01	2025-04-01	Dynagas	Hyundai Heavy
Hyundai Samho 8049	XDF	174000	2022-08-01	2025-03-01	NYK	Hyundai Samho
Samsung 2612	ME-GA	174000	2022-09-01	2025-03-01	Pan Ocean, SK Shipping, H-Line	Samsung
Clean Mistral	ME-GA	200000	2022-03-01	2025-03-01	Dynagas	Hyundai Heavy
Samsung 2607	ME-GA	174000	2022-02-01	2025-03-01	H-Line	Samsung
Hudong-zhonghua H1792a	XDF	175000	2021-10-01	2025-03-01	MOL	Hudong-Zhonghua
Hudong-zhonghua H1881a	XDF	174000	2022-01-01	2025-08-01	MOL	Hudong-Zhonghua

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Name	Propulsion	Capacity	Ordered	Delivery	Owners	Yard
Samsung 2601		174000	2021-12-01	2025-01-01	JP Morgan	Samsung
Samsung 2598	ME-GA	180000	2021-12-01	2025-01-01	Celsius Shipping	Samsung
Samsung 2595		174000	2021-10-01	2025-01-01	JP Morgan	Samsung
Puteri Mayang	XDF	174000	2021-07-01	2025-01-01	Hyundai LNG Shipping	Hyundai Heavy
Samsung 2597	ME-GA	174000	2021-10-01	2024-12-01	JP Morgan	Samsung
Samsung 2602	ME-GA	174000	2022-01-01	2024-12-01	H-Line, Pan Ocean, SK Shipping	Samsung
Samsung 2603	ME-GA	174000	2022-01-01	2024-12-01	H-Line, Pan Ocean, SK Shipping	Samsung
Samsung 2604	XDF	174000	2021-12-01	2024-12-01	NYK	Samsung
Hudong-zhonghua H1791a	XDF	175000	2021-10-01	2024-12-01	MOL	Hudong-Zhonghua
New Oasis	ME-GA	174000	2021-07-01	2024-12-01	Pan Ocean	Hyundai Heavy
Samsung 2596	ME-GA	174000	2021-10-01	2024-11-01	JP Morgan	Samsung
Puteri Mahsuri	XDF	174000	2021-07-01	2024-11-01	Hyundai LNG Shipping	Hyundai Heavy
Hyundai Samho 8100	ME-GA	174000	2020-12-01	2024-11-01	Knutsen	Hyundai Samho
Hudong-zhonghua H1880a	XDF	174000	2022-01-01	2024-10-01	MOL	Hudong-Zhonghua
New Green	ME-GA	174000	2021-07-01	2024-10-01	Pan Ocean	Hyundai Heavy
Samsung 2635	ME-GA	174000	2022-04-01	2024-09-01	TMS Cardiff Gas	Samsung
Samsung 2594		174000	2021-10-01	2024-09-01	JP Morgan	Samsung
Samsung 2473	XDF	174000	2021-05-01	2024-09-01	Maran Gas Maritime	Samsung
New Brave	XDF	174000	2020-12-01	2024-09-01	Pan Ocean	Hyundai Heavy
Hyundai Samho 8170	ME-GA	174000	2022-02-01	2024-08-01	Hyundai Glovis	Hyundai Samho
New Nature	XDF	174000	2020-12-01	2024-10-01	Pan Ocean	Hyundai Heavy
Samsung 2600		174000	2021-12-01	2024-07-01	JP Morgan	Samsung
Apostolos	ME-GA	174000	2021-11-01	2024-06-01	Capital Gas	Hyundai Heavy
Samsung 2593		174000	2021-10-01	2024-06-01	JP Morgan	Samsung
Puteri Santubong	XDF	174000	2021-04-01	2024-06-01	Hyundai LNG Shipping	Hyundai Heavy
Assos	ME-GA	174000	2021-11-01	2024-05-01	Capital Gas	Hyundai Heavy
Puteri Ledang	XDF	174000	2021-07-01	2024-05-01	Hyundai LNG Shipping	Hyundai Heavy
Clean Future	ME-GA	200000	2021-05-01	2024-03-01	Dynagas	Hyundai Heavy
Clean Vitality	ME-GA	200000	2021-05-01	2024-02-01	Dynagas	Hyundai Heavy
Puteri Saadong	XDF	174000	2021-04-01	2024-02-01	Hyundai LNG Shipping	Hyundai Heavy
Hyundai Ulsan 3371	ME-GA	174000	2022-05-01	2025-03-01	SK Shipping	Hyundai Heavy
Hudong-zhonghua H1885a	XDF	174000	2022-01-01	2026-09-01	MOL	Hudong-Zhonghua
Samsung 2653	ME-GA	174000	2022-11-01	2026-03-01	Minerva Marine	Samsung
Samsung 2651	ME-GA	180000	2022-10-01	2025-11-01	Celsius Shipping	Samsung
Samsung 2637	ME-GA	174000	2022-06-01	2025-07-01	JP Morgan	Samsung
Samsung 2582	XDF	174000	2021-10-01	2024-01-01	NYK	Samsung
Samsung 2585	ME-GA	180000	2021-08-01	2024-07-01	Celsius Shipping	Samsung
DALIAN NO 1 G175K-8	XDF	175000	2023-03-01	2027-02-01	China Merchant	Dalian Shipbuilding
DALIAN NO 1 G175K-7	XDF	175000	2023-03-01	2026-12-01	China Merchant	Dalian Shipbuilding
DAEWOO 2571	XDF	174000	2022-09-01	2026-05-01	MISC	Hanwha Ocean
DAEWOO 2570	XDF	174000	2022-09-01	2026-01-01	MISC	Hanwha Ocean
Hyundai Samho 8182	XDF	174000	2022-10-01	2026-01-01	TMS Cardiff Gas	Hyundai Samho
Mulan Spirit	XDF	79800	2021-05-01	2023-12-01	Jovo Energy	Jiangnan
Daewoo 2568	XDF	174000	2022-09-01	2026-06-01	Meiji Shipping	Hanwha Ocean
Daewoo 2567	XDF	174000	2022-09-01	2025-09-01	Meiji Shipping	Hanwha Ocean
Daewoo 2569	XDF	174000	2022-09-01	2026-09-01	Meiji Shipping	Hanwha Ocean
Daewoo 2566	XDF	174000	2022-09-01	2025-08-01	Meiji Shipping	Hanwha Ocean
Hyundai Ulsan 3384	XDF	174000	2022-07-01	2026-02-01	Knutsen	Hyundai Heavy
Hyundai Ulsan 3382	XDF	174000	2022-07-01	2025-07-01	Knutsen	Hyundai Heavy
Hyundai Ulsan 3383	XDF	174000	2022-07-01	2025-11-01	Knutsen	Hyundai Heavy
Hyundai Ulsan 3387	XDF	174000	2022-07-01	2026-08-01	Knutsen	Hyundai Heavy

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 = 30 November 2023

Name	Propulsion	Capacity	Ordered	Delivery	Owners	Yard
Hyundai Ulsan 3385	XDF	174000	2022-07-01	2026-04-01	Knutsen	Hyundai Heavy
Hyundai Samho 8201	XDF	174000	2022-07-01	2026-08-01	TMS Cardiff Gas	Hyundai Samho
Hyundai Samho 8200	XDF	174000	2022-07-01	2026-03-01	TMS Cardiff Gas	Hyundai Samho
Alexey Kosygin	TFDE - Azipod	172600	2019-09-01	2024-03-01	Smart LNG	Zvezda SSK
Axios II	ME-GA	174000	2021-06-01	2023-12-01	Capital Gas	Hyundai Heavy
Daewoo 2562	ME-GA	174000	2022-06-01	2025-06-01	SK Shipping, Pan Ocean, H-Line	Hanwha Ocean
Daewoo 2564	ME-GA	174000	2022-06-01	2025-11-01	Pan Ocean, SK Shipping, H-Line	Hanwha Ocean
Daewoo 2561	ME-GA	174000	2022-06-01	2025-05-01	Pan Ocean, SK Shipping, H-Line	Hanwha Ocean
Daewoo 2565	ME-GA	174000	2022-06-01	2026-02-01	Pan Ocean, SK Shipping, H-Line	Hanwha Ocean
Daewoo 2560	ME-GA	174000	2022-06-01	2025-04-01	H-Line, Pan Ocean, SK Shipping	Hanwha Ocean
Daewoo 2563	ME-GA	174000	2022-06-01	2025-11-01	H-Line, Pan Ocean, SK Shipping	Hanwha Ocean
Daewoo 2545	MEGI	174000	2022-04-01	2025-12-01	BWGas	Hanwha Ocean
Daewoo 2544	MEGI	174000	2022-04-01	2025-11-01	BWGas	Hanwha Ocean
Daewoo 2551	ME-GA	174000	2022-04-01	2026-09-01	MOL	Hanwha Ocean
Daewoo 2550	ME-GA	174000	2022-04-01	2025-09-01	MOL	Hanwha Ocean
Samsung 2474	XDF	174000	2021-05-01	2024-09-01	Maran Gas Maritime	Samsung
Daewoo 2540	MEGI	174000	2022-02-01	2025-12-01	Maran Gas Maritime	Hanwha Ocean
Daewoo 2528	MEGI	174000	2021-11-01	2024-08-01	Maran Gas Maritime	Hanwha Ocean
Daewoo 2546	ME-GA	174000	2022-06-01	2024-12-01	H-Line, Pan Ocean, SK Shipping	Hanwha Ocean
Daewoo 2547	ME-GA	174000	2022-06-01	2024-12-01	H-Line, Pan Ocean, SK Shipping	Hanwha Ocean
Daewoo 2549	ME-GA	174000	2022-06-01	2025-02-01	H-Line, Pan Ocean, SK Shipping	Hanwha Ocean
Daewoo 2548	ME-GA	174000	2022-06-01	2025-01-01	H-Line, Pan Ocean, SK Shipping	Hanwha Ocean
Daewoo 2552	MEGI	174000	2022-06-01	2026-05-01	Maran Gas Maritime	Hanwha Ocean
Dalian No 1 G175k-1	XDF	175000	2022-04-01	2025-09-01	China Merchant	Dalian Shipbuilding
Dalian No 1 G175k-2	XDF	175000	2022-04-01	2025-12-01	China Merchant	Dalian Shipbuilding
Daewoo 2536	ME-GA	174000	2022-01-01	2024-09-01	MOL	Hanwha Ocean
Jiangnan H2701	XDF	175000	2022-03-01	2025-05-01	ADNOC	Jiangnan
Jiangnan H2704	XDF	175000	2022-05-01	2026-06-01	ADNOC	Jiangnan
Jiangnan H2702	XDF	175000	2022-05-01	2025-09-01	ADNOC	Jiangnan
Jiangnan H2703	XDF	175000	2022-05-01	2026-01-01	ADNOC	Jiangnan
Jiangnan H2700	XDF	175000	2022-03-01	2025-01-01	ADNOC	Jiangnan
Jiangnan H2705	XDF	175000	2022-05-01	2026-09-01	ADNOC	Jiangnan
Samsung 2632	ME-GA	174000	2022-05-01	2025-12-01	H-Line	Samsung
Samsung 2631	ME-GA	174000	2022-05-01	2025-07-01	H-Line	Samsung
Daewoo 2553	MEGI	174000	2022-06-01	2026-06-01	Maran Gas Maritime	Hanwha Ocean
Samsung 2633	ME-GA	174000	2022-05-01	2026-01-01	H-Line	Samsung
Daewoo 2539	MEGI	174000	2022-02-01	2025-11-01	Maran Gas Maritime	Hanwha Ocean
Daewoo 2537	MEGI	174000	2022-01-01	2025-09-01	Maran Gas Maritime	Hanwha Ocean
Hyundai Samho 8181	ME-GA	174000	2022-04-01	2025-12-01	Knutsen	Hyundai Samho
Daewoo 2529	MEGI	174000	2021-11-01	2024-11-01	Maran Gas Maritime	Hanwha Ocean
Daewoo 2538	MEGI	174000	2022-01-01	2025-11-01	Maran Gas Maritime	Hanwha Ocean
Hudong-zhonghua H1835a	XDF	174000	2021-12-01	2024-12-01	ULT	Hudong-Zhonghua
Hudong-zhonghua H1836a	XDF	174000	2021-12-01	2025-03-01	ULT	Hudong-Zhonghua
Daewoo 2534	MEGI	174000	2022-01-01	2025-06-01	GasLog	Hanwha Ocean
Samsung 2583	XDF	174000	2021-10-01	2024-02-01	NYK	Samsung
Daewoo 2524	ME-GA	174000	2021-09-01	2024-04-01	MOL	Hanwha Ocean
Daewoo 2526	ME-GA	174000	2021-09-01	2024-10-01	MOL	Hanwha Ocean
Daewoo 2523	ME-GA	174000	2021-09-01	2024-02-01	MOL	Hanwha Ocean
Daewoo 2525	ME-GA	174000	2021-09-01	2024-08-01	MOL	Hanwha Ocean
Daewoo 2522	MEGI	174000	2021-07-01	2024-05-01	Hyundai LNG Shipping	Hanwha Ocean

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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	Titan Vision	12,000	LNG/LPG/Ethylene	Europe	No	Titan LNG
2011	Titan Unikum	12,000	LNG/LPG/Ethylene	Europe	No	Titan LNG
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 Innvovation	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	Spain	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
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	Green Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	New Frontier 1	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	Blue Whale	7,500	LNG	Korea	Yes	Korea Line

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Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
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	FueLNG Bellina	7,500	LNG	Singapore	Yes	FuelLNG
2020	SM Jeju LNG2	7,500	LNG	Korea	Yes	Korea Line
2020	Q-LNG 4000	4,000	LNG	US Coast	Yes	
2020	Flexfueller 002	1,480	LNG	Antwerp	Yes	Titan LNG
2021	Avenir Ascension	7,500	LNG		Yes	Avenir LNG
2021	Hai Gang Wei Lai	20,000	LNG	China	Yes	SSES
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	Brassavola	12,000	LNG	Singapore	Yes	MOL
2021	Gas Vitality	18,600	LNG	Mediterranean	Yes	MOL
2021	TG TBN	500	LNG	Korea	Yes	Trans Gas
2021	Titan Hyperion	8,000	LNG	Benelux	Yes	Titan LNG
2022	Xin Ao Pu Tuo Hao	8,500	LNG	China	Yes	ENN
2022	Coral Nordic	30,000	LNG	Worldwide	Yes	Anthony Veder
2022	Avenir Achievement	20,000	LNG	Worldwide	Yes	Avenir LNG
2022	Haugesund Knutsen	5,000	LNG	Spain	Yes	Knutsen OAS
2022	Clean Cañaveral	5,400	LNG	USG	Yes	PNE
2022	K.Lotus	18,000	LNG	Korea	Yes	K Line
2023	Cryopeak TBA	4,000	LNG	West Canada	Yes	Cryopeak
2023	Levante LNG	12,500	LNG	Spain	Yes	Knutsen OAS
2023	SM Jeju LNG3	7,500	LNG	Korea	Yes	Korea Line
2023	New Frontier 2	18,000	LNG	USG	Yes	Shell
2023	Krios	4,200	LNG	Benelux	Yes	Titan LNG
2023	Alice Cosulich	8,000	LNG	Mediterranean	Yes	Fratelli Cosulich
2023	Kanfer TBN	6,000	LNG	Worldwide	Yes	Kanfer Shipping
2023	Kanfer TBN	6,000	LNG	Worldwide	Yes	Kanfer Shipping
2023	Clean Everglades	5,500	LNG	USG	Yes	PNE
2023	FueLNG Venosa	18,000	LNG	Singapore	Yes	FuelLNG
2023	LNG Erasmus	8,000	LNG	NWE	Yes	Shell
2023	Energy Stockholm	8,000	LNG	NWE	Yes	Shell
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2024	Coral Evolution	30,000	LNG	Australia	Yes	Anthony Veder ?
2024	Crowley TBN	12,000	LNG	US Coast	Yes	Crowley Maritime
2024	CNOOC TBN	12,000	LNG	China	Yes	CNOOC
2024	TBN	12,500	LNG	Worldwide	Yes	???
2024	Keys TBN	3,500	LNG	Japan	Yes	Keys Bunkering West Japan Co
2024	Seaspan Garbaldi	7,600	LNG	Panama	Yes	Seaspan ULC
2024	Paolina Cosulich	8,000	LNG	Mediterranean	Yes	Fratelli Cosulich
2024	Anhui Changjiang TBN	14,000	LNG	China	Yes	Anhui Changjiang LNG
2024	Keys Azalea	3,000	LNG / Oil	Japan	Yes	Keys Bunkering West Japan Co
2025	Seaspan TBN 2	7,600	LNG	Canada	Yes	Seaspan ULC
2025	Axpo TBN	7,500	LNG	Italy	Yes	Axpo
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	ScaleGas TBN	12,500	LNG	Spain	Yes	ScaleGas

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