

LNG Fuelling

AN LNG JOURNAL PUBLICATION

1st Quarter 2022

Global momentum to spur LNG bunker growth

LNG could account for 10% of the bunker market by 2030 as 'global momentum' spurs new infrastructure, according to energy major TotalEnergies, but uptake still faces several challenges in the short term.

Despite exponential increases in LNG-fuelled vessels and infrastructure over the last few years, LNG still holds only a small share of global bunkering, but a recent whitepaper published by TotalEnergies - *The Drive for Cleaner Marine Fuels* - is more bullish, forecasting that the LNG bunker market will reach 10 million tonnes a year by 2025 as fundamental shifts in investment drive significant changes.

"From our daily conversations and discussions with our shipping customers and partners, we know how complex and daunting a challenge it is to undertake this energy transformation," Jérôme Leprince-Ringuet, Vice-President Marine Fuels, TotalEnergies, comments, adding that of all the alternative fuel solutions available today, "LNG is the cleanest marine fuel solution available at scale".

Bunker fleet doubling

Sharp rises in gas prices and unprecedented global competition



LNG bunker vessel

for natural gas over the last three years have hindered the use of LNG and John Bassadone, CEO of Peninsula, cautions over the prospects for near term growth, predicting that the macro picture points to only 'very modest growth'.

Despite these headwinds, TotalEnergies predicts that LNG will emerge as a fuel of choice for many segments of the maritime sector and forecasts that the LNG bunkering fleet will double in size in the next two years.

"We understand the challenges and difficulties that customers can have to find the right pricing solution," Leprince-Ringuet explains, but adds that there is "a rising global momentum for shipping companies to take positive action - now - to reduce their environmental footprint by using LNG as their solution choice."

The firm forecasts the global LNG bunker fleet will grow to 43 units by early 2024, offering an aggregated capacity of between 7 and 8 million tonnes per year.

Oman LNG bunker fuel JV

TotalEnergies has made LNG a central plank of its strategy going forward, actively invested in bunkering infrastructure to create an LNG supply chain across strategic bunkering hubs.

In December last year, the firm established Marsa LNG, a joint venture with the Ministry of Energy and Minerals of the Sultanate of Oman, to develop a low-carbon LNG plant in Sohar, powered by solar electricity, for the production of LNG for bunker fuel.



Jérôme Leprince-Ringuet, Vice President Marine Fuels at TotalEnergies

"We are pleased to sign these agreements with the Sultanate of Oman and further develop our activities in the country while contributing to develop its energy sector in a more sustainable manner", Laurent Vivier, Senior Vice President Middle East and North Africa at TotalEnergies, said.

Under the terms of the agreement, Marsa LNG will produce natural gas from Block 10, with a view to subsequently developing LNG infrastructure and selling natural to the government, for a duration of 18 years or until the start-up of Marsa LNG plant.

"In terms of the alternative fuel solutions available today, LNG is the cleanest marine fuel solution available at scale, delivering a range of benefits in helping to drive down GHG emissions whilst improving ports' air quality with assurance that the fuel does not release any black carbon. Crucially, LNG also provides us with the gateway to the development of next generation solutions, including lower-carbon bioLNG, which I believe will serve as an important pathway to enable the shipping sector in reaching its decarbonization goals," Leprince-Ringuet concludes.

FUELLING NEWS AGENDA

FLEET GROWTH

DNV sees LNG fleet swell in 2022

2

BEST PRACTICE

SGMF releases updated LNG bunkering guidelines

3



FUELLING STATIONS

Cryonorm, Liqvis sign Mercury II extension

4

SHIPBUILDING

Fincantieri begins construction of record LNG bunker barge

5

CHINA

CMA CGM, SIPG sign LNG bunker partnership

7

FERRIES

Titan LNG to supply new Corsica Linea LNG ferry

8

SINGAPORE

Singapore posts robust LNG bunker demand for 2021

9



CHARTERS

Port of Marseille Fos completes containership bunkering first

10

PUMP SOLUTIONS

Newbuild demand propels Svanehøj orderbook

11

LNG ORDERBOOK

LNG bunker vessels

12

LNG small scale fleet

14

DNV sees LNG fleet swell in 2022

Growth in the global LNG fleet has continued apace in 2022, with Norwegian standards agency DNV GL adding more than three dozen new LNG-fuelled ships to its index.

Martin Christian Wold, Principal Consultant at DNV, highlights continued growth for the LNG bunker sector in 2022, stating, “seems like the new year is off to a strong start as we’ve added 40 LNG-fuelled ships to our AFI database in January.”

The firm’s Alternative Fuel Insight (AFI) database tracks LNG-fuelled vessels globally and is part of an open platform for evaluating the uptake of alternative fuels and technologies.

“Growth is again driven by large container ships, and this round it was MSC Mediterranean Shipping Company in particular

pushing the total count of LNG fuelled ships confirmed to nearly 700. A.P. Moller - Maersk continues their investment in methanol and added 4 more ships,” Wold added.

Record growth in 2021

Strong performance this quarter follows robust development in 2021, with LNG bunker additions creating record growth last year, according to DNV.

“Despite a very slow end to the year with only two LNG-fuelled ships ordered, 2021 was a record year. The 2021 count ended at a net increase of 240 ships, more than the previous 4 years com-

bined. And this in spite of LNG bunker fuel reaching completely unforeseen high price levels all through H2,” Wold commented.

The firm also reported a sharp rise in LNG bunker vessel contracting and charter-agreements in December, adding “much needed supply options for the rapidly growing LNG fuelled fleet” and driving momentum into Q1.

“The ships contracted in 2021 added more than 3 MTPA to global LNG bunkering demand,” Wold states.

Headquartered in Høvik in Norway, DNV GL is an international accredited registrar and also pro-



Martin Christian Wold, Principal Consultant at DNV

vides technical consultancy to the energy and transport sectors. ■

Gregory expands bioLNG fleet

UK logistics group Gregory Distribution has extended its use of bioLNG with the addition of 12 new Volvo LNG tractor units.

The firm announced that it will add the FM Globetrotter LNG 6x2 tractor units at its Cullompton base in the south of England. The new vehicles will be used for milk transshipment operations and are expected to clock-up 200,000 km per year for the next five years.

“We put our first LNG trucks on the road 18 months ago and the reduction in carbon emissions have been clear to see,” Andrew Chapple, Director of Fleet, Prop-

erty and Procurement at Gregory Distribution, explained. “There is a growing expectation from our customers to help them in their own sustainability drive, and these Volvos are the perfect solution.”

Volvo FM Globetrotter units

The new vehicles will take the total number of gas-powered Volvos in Gregory’s fleet to 35, and is part of a wider strategy to tran-

sition at least 5% of its fleet from diesel to cleaner fuels every year.

“For long-distance haulage, Bio-LNG is the most sustainable option on the market today and our drivers have welcomed the transition. Compared with diesel, these trucks offer the same driveability, reliability and service intervals; plus, they are around 50 per cent quieter too - which brings additional benefits from both a driver and delivery perspective,” Chapple added.

The LNG-fuelled vehicles will be powered by Volvo’s G13C engine which delivers the same 460 horsepower (hp) and 2,300 newton-meters of torque as a standard 460 hp diesel.

Skid-mounted refuelling

All of the new FM units feature four options packs designed to increase fuel-efficiency and include

Volvo’s intelligent I-See predictive cruise control, electrically controlled air-conditioning, static corner lights and X Multi Energy fitments on the drive axle, for low rolling resistance and maximum range amongst other technical innovations.

“The trucks will be fuelled from a skid-mounted Bio-LNG refuelling facility at the customer’s Cullompton base, with the vehicle’s range sufficient to tackle a return journey to the home counties. Plans are already in place with Gasrec to install a much larger four-bay station in Cullompton, as Gregory Distribution’s biomethane-powered truck fleet continues to grow.

The FM units will be supplied Volvo Trucks UK & Ireland and will offer a payload advantage of nearly 700kg over the previous FH series. ■



Gregory Distribution gas-fuelled trucks

LNG Fuelling

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

Publisher

Stuart Fryer

Editor

Malcolm Ramsay
+44 (0)20 7253 2700
malcolm@lngjournal.com

Ad sales enquiries

Narges Jodeyri
+44 (0)207 017 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

No part of this publication may be reproduced or stored in any form by any mechanical, electronic, photocopying, recording or any other means without the prior written consent of the publisher. Whilst the information and articles in LNG Shipping News are published in good faith and every effort is made to check accuracy, readers should verify facts and statements direct with official sources before acting on them as the publisher can accept no responsibility in this respect. Any opinions expressed in this publication should not be construed as those of the publisher.”

SGMF releases updated LNG bunkering guidelines

The Society for Gas as a Marine Fuel (SGMF) has published updated operational guidance for LNG bunkering, calling the safe use of LNG as a marine fuel 'a priority issue'.

The release of its 'LNG as a marine fuel - Safety and Operational Guidelines - Bunkering' publication marks the third revision of its guidance and includes comprehensive coverage of all aspects of the LNG fuel bunkering process.

"The information contained in this publication is gold dust for anyone bunkering an LNG fuelled ship," Chairman of SGMF and Chief Operating Officer of Nakilat Samir Bailouni commented. "These practices and insights are collated from the best the industry has to offer, and I extend my thanks to our members for providing this invaluable information not only for the benefit of the industry, but for society as a whole."

Holistic approach

The publication was first introduced in 2014 and since then has been extensively updated to account for the rapid pace of development in the sector.

The latest guidelines incorporate operational experience in a holistic approach to the refuelling process, from the design of bunkering vessels and facilities to the planning and preparation of the bunkering operations and locations.

"The safe and sustainable use

of gaseous marine fuels are the core objectives for SGMF and these bunkering guidelines for LNG are a cornerstone reference for the industry. As the industry grows, being able to supply new entrants with these guidelines provides them with a valuable head start in ensuring they can operate with maximum safety and efficiency, no maritime gas fuelled project should be without them," Mark Bell, General Manager of SGMF, explained.

Sustainable bunkering

As well as providing a practical basis for day-to-day operations the new guidelines also give a comprehensive overview of the sector and allow firms to not only calculate risks associated with LNG but to benchmark against a range of alternative fuels, with reference to specific requirements for synthetic and bio-LNG.

"Whilst the industry currently debates other future gaseous marine fuels such as ammonia and

hydrogen, be assured SGMF is currently working on and will produce further guidelines for these fuels in a similar manner to what it has done for LNG. Meanwhile, I strongly encourage and advocate the continued focus on safe and sustainable bunkering for all these fuels through support for the important work and leadership of the Society in these aspects." Mark Bell, General Manager of SGMF.

The SGMF is headquartered in London and includes 148 members worldwide with a combined LNG-fuelled fleet of 251 vessels in operation and 431 LNG-fuelled ships and LNGVs on order. It also includes the participation of major bunkering hubs such as Antwerp, Rotterdam and Singapore.

"Bunkering LNG involves a range of potential hazards, but when good practice is applied and followed, the risks can be effectively mitigated. The overall aim of this new publication is to ensure that gas-fuelled ships can be bunkered safely, reliably, efficiently, and in an environmentally responsible way. It has only been made possible through the partnership, cooperation, support and open information from our members," Bell concludes. ■



LNG refuelling operation



Publication offers best practice guidance

Cryonorm, Liqvis sign Mercury II extension

Fuelling specialists Cryonorm Systems and Liqvis have signed a collaboration agreement to develop a series of public LNG fuelling stations in Europe.

The new contract is an extension of the previous MERCURY I EPC agreement signed by the firms in 2018.

"We highly appreciate the good collaboration with Liqvis and proud to be awarded with the MERCURE II contract. Based on the operational feedback and open discussions between the teams, both companies contributed to the current station design offering highest availability and optimized design to fit several plots. These stations will further contribute to achieving the climate targets for heavy goods vehicles," Piet Tel, Owner and CEO of Cryonorm Group, said.

Skid-mounted fuelling stations

The original Mercury I contract signed in 2018, covers the development of 16 LNG stations and the new extension will add a fur-

ther 16 skid-mounted public LNG fuelling stations in Germany and France.

Manning Director of Liqvis, Sebastian Gröbblinghoff, predicts the deal will strengthen the business partnership with Cryonorm, noting "Expanding the LNG fuelling station network across Europe requires the co-operation with a strong, reliable and competent equipment manufacturer. We are happy that with Cryonorm we have found such a partner that also shares our vision of driving the promotion of alternative fuels as well as the decarbonisation of heavy-duty transport."

The new stations will be constructed by Cryonorm and will follow the model of the 12 LNG-fuelling stations the firm has already built for LIQVIS. French developer Liqvis operates a variety of LNG infrastructure for heavy goods vehicles and has been operating LNG



Liqvis LNG fuelling station

filling stations in Germany since 2017. The firm is a wholly owned subsidiary of international energy group Uniper SE, which has roughly 35 gigawatts of installed generation capacity in Europe and Russia as well as global energy trading and a broad gas portfolio.

BioLNG demand growing

The firms expect that initial demand will primarily come from long-haul transportation with interest in BioLNG growing over the medium term as it becomes "one

of the most important fuels" for sustainable transport "in the near future."

Headquartered in the Netherlands, Cryonorm is a designer and supplier of bespoke Cryogenic Systems and vaporizers. The firm recently established subsidiary CryoTek Services was to cover after sales services in Germany.

A recent report by the Gas for Climate initiative suggests that BioLNG production in Europe is set to grow eightfold to 9.5 terrawatt-hours by 2023. ■

Snam4Mobility, OG plan bioLNG refuelling station

Fuelling specialists Snam4Mobility and OrangeGas (OG) have signed a partnership agreement to jointly develop a new bioLNG refuelling station in Germany.

The partners will work together to build the station in Paderborn in North Rhine-Westphalia and expect to commission the facility in 2023. It will deliver bioLNG and bioCNG, a format the firm dubs bioLCNG.

"With this agreement, we are launching an important partnership to help decarbonise light and heavy transports in Germany, by leveraging our expertise in building and managing refuelling stations and combining our strengths

with those of OG along the biomethane value chain", Alessio Torelli, CEO of Snam4Mobility, said.

Clean refuelling network

Launched in 2018, Snam4Mobility is a subsidiary of Italian energy infrastructure group Snam and aims to promote the growth of Italy's natural gas for transport distribution network.

Under the terms of the agree-

ment the new Paderborn station will be built by Snam4Mobility and will be operated by OG within its network of service stations. It will provide both liquefied and compressed biomethane for light- and heavy-duty transports in Germany.

"The experience that Snam4Mobility has in Italy makes them the ideal partner to further expand our international clean refuelling network and fits perfectly with our ambition to be the largest independent clean fuel retailer in Europe. Four new bioLCNG stations will be opened in Germany this year, with the aim of opening a total of twenty stations in the next three years," Wiltze Bakker, Head Network Development Europe at OG, said.

This agreement marks the first project outside of Italy for Snam4Mobility.

Further expansion

OG expects the new German bioLNG stations will be an important addition to its growing network of Clean Fuel Stations in Germany, Sweden and the Netherlands. The firm currently offers 100% bioCNG at all its CNG stations and from the beginning of 2023, OG will only offer 100% bioLNG at its LNG stations as well.

"The cooperation with Snam4Mobility is a great step forward to further expand our bioLNG and bioCNG network in Germany," Bakker states.

Headquartered in the Netherlands, OG is a Dutch owner and operator of refuelling infrastructure across Europe, including Bio-CNG, electric fast chargers, Hydrogen, LNG, Liquid Biogas and CO2 for environmentally friendly cooling. ■



Snam4Mobility and OG will develop new refuelling infrastructure

Fincantieri begins construction of record LNG bunker barge

Construction has started on the largest-ever LNG bunkering barge in the US, at Fincantieri Bay Shipbuilding in Wisconsin.

The project has been undertaken on behalf of shipping and fuelling firm Crowley. The first piece of steel for the vessel was cut at Fincantieri's facility in Sturgeon Bay in the northwest of Lake Michigan on January 6.

"We are excited to get this project started, and equally pleased that it builds on our relationship with Crowley and Shell," said Craig Perciavalle, Vice President & General Manager of Fincantieri Bay Shipbuilding. "Our team is committed to giving our customers the best value, and we are happy to get started on this important project."

Largest Jones Act-compliant vessel of its kind

The new vessel will be 416 feet in length and will have the capacity for 12,000 cubic metres of LNG. Once complete it will be the largest Jones Act-compliant vessel of its kind, and the second Jones Act-compliant bunker barge Shell has under charter in the country.

Dario Deste, head of Fincantieri's U.S. operations, said the team working on the project had "done a tremendous job of manag-



Artist's rendition of the LNG bunker barge

ing the build cycles of several large and important vessels during the pandemic. Even with COVID-related supply chain challenges globally, we continue to meet our customers' timelines. Delivering on schedule is a point of pride for Fincantieri."

In 2020, the Shipbuilders Council of America recognized Fincantieri Bay Shipbuilding as one of the safest U.S. shipyards.

Landmark vessel

Crowley is the largest independent operator of tank vessels in the US and will operate the vessel under a long-term charter with Shell NA LNG.

"In partnership with Shell, this

vessel will expand the availability of LNG to vessels and help advance the transition to lower-emission fuels as the industry seeks to reduce emissions," Tucker Gilliam, vice president, Crowley Shipping, said. "We congratulate the men and women of Bay Shipbuilding on the start of this innovative, landmark vessel that will help the maritime industry meet demand for cleaner operations with reduced emissions."

Tahir Faruqi, general manager, Global DLNG for Shell, also applauded the start of fabrication, stating that the bunker vessel would "support the shipping sector's continued progress toward decarbonization".



Fincantieri Bay Shipbuilding facility

NEWS NUDGES

Gasnam reports LNG bunkering growth in Spain

Gas and fuel association Gasnam has reported strong growth in LNG bunkering activity in Spain last year, with 950 LNG bunker operations completed in the country in 2021.

This represents a 27% increase compared to the 741 bunkering operations completed 2020, and this in turn was an almost four-fold increase over 2019. Eleven Spanish ports provided LNG refuelling services in 2021, including: Algeciras, Almeria, Bilbao, Cadiz, Cartagena, Ferrol, Gijón, Huelva, Malaga, Motril and Tenerife.

The port of Barcelona emerged as the leading hub for LNG bunkering operations with a total of 230 operations transferring a total of 60,951 cubic metres of LNG, equivalent to 42% of the national total. The port of Valencia ranked second in terms of volume with 27,174 cubic metres transferred and 240 operations completed. Denia achieved third place with 13,650 cubic meters of LNG transferred and 166 operations.

Headquartered in Madrid, Gasnam is a sustainable transport association comprising 142 partners in Spain and Portugal. Its members span multiple sectors, including energy, automotive, engineering, freight, passenger transport, ports, shipping companies, shipyards, universities, and administrations.

Rotterdam posts Q4 LNG bunker growth

Authorities at the Port of Rotterdam have reported strong LNG bunker sales for Q4 2021, with volumes reaching 603,690 cubic metres, a rise of 187%.

Biofuels also posted strong growth, with annual volumes reaching 301,051 cubic metres, based on total sales, including all conventional fuel/biofuel blends.



CLEAN & SUSTAINABLE COOLER BY DESIGN®

Chart is at the forefront of the transition

to a low carbon future through technology, equipment and services delivering hydrogen, LNG and biogas for energy and transportation. Our carbon capture technology also removes harmful pollutants including SO_x, NO_x and mercury.

www.ChartIndustries.com
LNG@ChartIndustries.com

CHART
Cooler By Design.®

CMA CGM, SIPG sign LNG bunker partnership

Container shipping line CMA CGM has signed a landmark agreement with Shanghai International Port Group (SIPG) to bunker vessels with LNG at Yangshan Port.

The deal will see a new LNG bunker barge, with 20,000 cubic metre capacity, deployed by SIPG at Yangshan to refuel Ultra Large Container Vessels (ULCV) operated by CMA CGM.

Rodolphe Saadé, CEO of the CMA CGM Group, called the agreement “an important milestone” in CMA CGM’s energy transition roadmap, making the firm “the first shipping line to bunker LNG in China.”

“We are glad that this premiere Chinese LNG bunkering operation could be made possible thanks to the very positive cooperation and excellent teamwork between CMA CGM and SIPG. It paves the way for further developments to the benefit of our Group and the Shanghai region,” Saadé added.

SIMOPS bunkering

Under the terms of the partnership, SIPG will deliver Simultaneous Operations (SIMOPS) LNG

bunkering service for CMA CGM’s vessels for a period of 10-years. Operations are set to commence from the first quarter of 2022.

“Shanghai Municipal Party Committee and Shanghai Municipal Government attached great importance to the bonded LNG bunkering for international ships at Shanghai Port, and strong support has been given by relevant departments and units in Shanghai. Bonded LNG bunkering for international ships is greatly related to fostering the world-class business environment of Shanghai as a harbour city and improving the service functions of Shanghai port,” Gu Jinshan, Chairman of SIPG, said.

The new service will support CMA CGM 15,000-TEU dual-fuel vessels operating on its Pearl River Express (PRX) line, sailing from China to the Port of Los Angeles

Long-term partnership

The new service will be the first



CMA CGM Jacques Saadé

operation of its kind in Shanghai port, and in China, and is part of a strategy by the Chinese government to transition marine transport to more sustainable fuels.

“It is of great significance to enhance the overall competitiveness of Shanghai international shipping centre. Today’s agreement signing ceremony will further enhance and strengthen our long-term partnership between SIPG and CMA CGM,” Jinshan commented.

SIPG has already invested in a

number of measures, such as cold-ironing and diesel-oil transition to create an environmentally-friendly port and continues to develop green ports in line with the national goal of “dual carbon” proposed in the 14th Five-year Plan.

CMA CGM has also underlined its long-term commitment to LNG and dual-fuel vessels, announcing that its plans to launch an “e-methane ready” fleet, consisting of 23 vessels already in service, with a total of 44 vessels by the end of 2024.



Yangshan Port

NEWS NUDGES

Dalian scoops LNG containership order

Shipping line MSC is reported to have ordered six dual-fuel containerships from Dalian Shipbuilding Industry.

The order will see the subsidiary of China State Shipbuilding Corporation (CSSC) fabricate the new-panamax vessels at its site in China’s Liaoning Province. MSC gained the title of the world’s largest containership carrier based on capacity at the end of last year, and this agreement is expected to take MSC’s orderbook to 72 vessels, with a total capacity of 1.1 million TEU.

MSC and CSSC declined to comment but the deal is believed to be valued at roughly US\$1 billion.

Titan LNG to supply new Corsica Linea LNG ferry

Fuel supplier Titan LNG has secured a tender to supply LNG for French ferry operator Corsica Linea at the port of Marseille.

The agreement will initially be fulfilled by truck-to-ship operations, prior to the launch of a new LNG bunker vessel, *Krios*, in 2023.

“This partnership marks the significant expansion of Titan’s operations into the Mediterranean which will enhance the availability of LNG, bioLNG, and in the longer run hydrogen-derived LNG in the region,” a spokesperson for Titan LNG said.

Pathway to full decarbonisation

Bunkering operations will initially serve Corsica Linea’s new ro-pax ferry, *A Galeotta*, which will begin sea trials in May and enter service shortly after.

“Having access to LNG and bioLNG infrastructure and bunkering allows us to take a significant positive step towards the decarboni-

sation of our fleet,” Pierre Antoine Villanova, CEO, Corsica Linea states. “When choosing LNG, the ability to act now on greenhouse gas emissions in the Mediterranean Sea stood out. We also recognised the pathway to full decarbonisation using LNG, bioLNG and hydrogen-derived LNG as a strong, clear and flexible option. Our exciting new ferry, *A Galeotta*, will be able to switch between LNG and bioLNG, and even blend the two, with no changes required onboard.”

The *A Galeotta* is currently under construction at the Visentini shipyard in Italy.

Mediterranean expansion

In 2020, Titan LNG secured funding via the EU’s Connecting Europe Facility to develop LNG bunker barges in Zeebrugge, Lubeck and Rotterdam.



Corsica Linea ferry

Niels den Nijs, CEO, Titan LNG, sees the move as the start of an expansion across the Mediterranean region, commenting “expanding infrastructure will help consolidate LNG as a leading sustainable marine fuel across the region. As a result, we hope to see more shipowners investing in LNG and bioLNG. I am delighted to be able to announce this partnership

and I look forward to further expansion of LNG in the Mediterranean region and beyond.”

Headquartered in the Netherlands, Titan LNG is a technology developer and full-service supplier of LNG to the marine and industrial markets in Northwest Europe, specialising in flexible LNG solutions for combined truck-to-ship bunkering and LNG Bunkering pontoons. ■

Stena selects Wärtsilä for newbuild LNG-fuelled ferries

Finnish engine manufacturer Wärtsilä has signed a contract with Swedish ferry operator Stena RoRo to supply LNG propulsion systems for three new ferries.

The agreement will see Wärtsilä provide dual-fuel engines and propulsion machinery for three vessels, currently under construction at at China Merchants Jinling Shipyard in Weihai in the east of Shandong province in China.

“We are delighted to help Stena RoRo bring the latest new vessels in its E-Flex series to market, and to work once again with Wärtsilä to ensure these vessels have highly efficient and environmentally sustainable propulsion,” Ni Weisong, Vice General Manager

at CMJL Weihai Shipyard, said.

46DF and 20DF engines

Under the terms of the deal, Wärtsilä will deliver supply Wärtsilä 46DF dual-fuel main engines, Wärtsilä 20DF dual-fuel auxiliary engines, two gearboxes, two controllable pitch propellers (CPP), the tunnel thrusters, and the fuel gas supply system for each vessel.

“We have earlier supplied a similar scope of solutions for Stena newbuild projects, and it is especially gratifying to receive this

repeat order. The cooperation between our companies and with the shipyard has been excellent, and we look forward to another successful outcome,” says Roger Holm, President, Wärtsilä Marine Power.

The engines and ancillary machinery will be supplied in 2024 and 2025.

E-Flex class

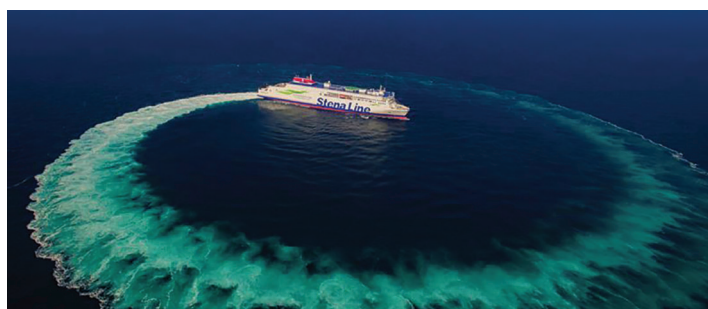
The newbuild vessels will form part of a series of E-Flex class ferries ordered by Stena RoRo for European line service. Wärtsilä will work closely with Stena RoRo to ensure that one of the vessels meets DNV’s Silent-E class notification.

“This recognises that underwater noise from the vessel is controlled to protect vulnerable environments and involves careful configuration and design of propulsion and onboard equipment to offer low noise while maintaining high efficiency,” a spokesper-

son for Wärtsilä explained.

Alongside the propulsion systems, Wärtsilä will also supply its Nacos navigation and automation technology, as well as integrated control alarm and monitoring system MCS Platinum together with the performance monitoring system. All three vessels will also feature Wärtsilä’s Smart Panoramic Edge Camera System, eliminating blind spots and creating a 360°, birds-eye view of the ships surroundings, offering a significant advantage when docking.

“We are very familiar with Wärtsilä’s ability to supply reliable and highly efficient solutions in line with our operational and sustainability requirements. In particular, their experience and leading know-how in LNG technologies is especially important to us as we move to decarbonise our services,” Per Westling, Managing Director of Stena RoRo, commented. ■



Stena Line vessel

Singapore posts robust LNG bunker demand for 2021

Authorities in Singapore have reported strong LNG bunker growth in 2021, with the nation retaining its position as one of the world's leading bunkering ports.

Singapore's Maritime and ports Authority (MPA) posted a total registered bunker sales volume of 50.04 million tonnes in 2021.

"Singapore commenced regular ship-to-ship LNG bunkering operations from March 2021 and will continue to diversify our fuel offerings in line with our push for maritime decarbonisation," a spokesperson for the port said.

Post-pandemic growth

The robust bunkering volumes included 50,000 tonnes of LNG bunker sales and 49.99 million tonnes of conventional bunkers sales.

"The Port of Singapore remained open and connected to the world in 2021 despite the ongoing COVID-19 pandemic," a spokesperson commented, adding that bunker sales also remained strong, "crossing 50 million tonnes for only the second time."

Norwegian classification society, DNV and consultancy Menon Economics, recently ranked Singapore as the top Leading Maritime City of the World for a fifth consecutive time, a decision the MPA called 'a strong testament of Singapore's performance' in the port sector and as an international maritime centre in shipping services and maritime technology.

LNG has been a central element of Singapore's wider energy transition roadmap and the country has invested heavily in developing bunkering capacity, seeking to accelerate its transformation over the course of the last two years.

Minister for Transport S. Iswaran said: "Maritime Singapore has shown itself to be resilient despite the challenges of the pandemic over the past two years. I am confident that the continued strong tripartite partnership between the Government, industry and unions will see us through the recovery phase and allow Maritime Singapore to emerge even stronger." said Minister Iswaran.

Minister for Transport S. Iswaran said: "Maritime Singapore has shown itself to be resilient despite the challenges of the pandemic over the past two years. I am confident that the continued strong tripartite partnership between the Government, industry and unions will see us through the recovery phase and allow Maritime Singapore to emerge even stronger." said Minister Iswaran.

Decarbonisation roadmap

Alongside the 2021 bunker performance, Iswaran also outlined four

key goals that will guide government efforts to advance the maritime sector - resilience, digitalisation, decarbonisation and talent. The Minister also called for greater consultation with industry and unions on the refreshed Sea Transport Industry Transformation Map (ITM).

Launched in 2018, Singapore's The Sea Transport ITM aims to strengthen Connectivity and Inter-Linkages, drive Growth through Productivity Enhancements and Innovation and develop a Future-Ready Maritime Workforce. In line with this strategy, the MPA last year implemented new measures to support LNG fuelling, reducing port dues for qualifying vessels.

"The use of more sustainable fuels is an important element of the decarbonisation strategy," Chee Hong Tat, Singapore's Senior Minister of State for Transport and Foreign Affairs, said, calling 'a viable transitional fuel' to support the shipping industry in its long-term goal to deliver alternative zero-carbon fuels.



Minister for Transport S. Iswaran

NEWS NUDGES

NYK orders four LNG-fuelled Capesize

Japanese shipping line Nippon Yusen Kaisha (NYK) has ordered four LNG-fuelled Capesize bulk carriers to transport coal and iron ore.

The vessels will be built by Japanese shipbuilders Nihon Shipyard and Namura Shipbuilding and Chinese shipbuilder Shanghai Waigaoqiao Shipbuilding. Delivery is scheduled for April 2024 to March 2026.

BHP refuels world's first LNG-powered Newcastlemax

Mining firm BHP has refuelled the world's first LNG-powered Newcastlemax bulk carrier in Singapore.

The Mount Tourmaline arrived at Jurong Port to be refuelled as part of a five-year bunkering contract between BHP and Shell. Weighing 209,000 deadweight-tonnes, the vessel was constructed by China's Shanghai Waigaoqiao Shipbuilding and will operate transporting iron ore between Western Australia and Asia.

BHP CCO Vandita Pant, said: "This vessel delivers significant improvements to energy efficiency and emissions intensity, as well as reduced overall GHG emissions in our value chain."



LNG refuelling in Singapore

Port of Marseille Fos completes LNG containership bunkering first

Authorities at the Port of Marseille Fos in the south of France have completed the first ship-to-containership LNG bunkering operation at the site.

The milestone bunkering operation was carried out by fuel supplier TotalEnergies and shipping line CMA CGM and saw around 6,000 cubic metres of LNG transferred to the *CMA CGM Bali*.

"TotalEnergies is delighted to successfully complete Marseille's first LNG bunkering operation of a containership via the *Gas Vitality*. Her deployment underscores the Company's commitment to support

the French port's ambition to be an LNG bunkering hub for the Mediterranean region," Jérôme Leprince-Ringuet, Vice-President Marine Fuels at TotalEnergies, said.

Growing role for LNG

Refuelling operations were carried out by TotalEnergies' *Gas Vitality*, the first LNG bunker vessel based in France.

"This landmark operation also demonstrates our continued support to the growing role of LNG in shipping's energy transition. In line with TotalEnergies' climate ambition, we will continue to work hand-in-hand with our industry partners to develop and scale up new, lower-carbon and ultimately, zero-carbon fuel solutions for shipping," Leprince-Ringuet added.

With capacity of 15,000 TEU, the *Bali* is one of the largest vessels ever bunkered at the port and part of a vast investment by CMA CGM to develop the largest fleet of LNG-fuelled containerships in the world.

Collaborative teamwork

Based at Marseille Fos, the *Gas Vitality* is owned by Mitsui O.S.K. Lines and is the second chartered

LNG bunker vessel to TotalEnergies.

"This entire operation underlines a solid collaborative teamwork across the French maritime industry including the involvement of local port authorities to enable the vessels' safe operatorship, and the commitments of all the parties to support the growing role of LNG in the shipping's energy transition," a spokesperson for TotalEnergies said.

Headquartered in Courbevoie, France, TotalEnergies is one of the seven "supermajor" oil companies and has been a leading proponent of LNG as a fuel of the future. In 2022, TotalEnergies also commenced operations of a third LNG bunker vessel to serve Singapore, where the Company was awarded a LNG bunker supplier license for a five-year term starting January 1. ■



CMA CGM Bali at the Port of Marseille Fos

Avenir LNG signs bunker time charter with Shell

Integrated distributor Avenir LNG has signed a time charter party agreement with Shell for an LNG bunkering supply vessel to serve North American markets.

The firm will charter the *Avenir Achievement*, a newbuild bunker vessel with capacity for 20,000 cubic metres of fuel.

"We are delighted to have executed this agreement with Shell for the *Avenir Achievement* and to play an important role in expanding Shell's LNG bunkering capabilities," Peter Mackey, CEO of Avenir LNG Limited, said.

Three-year term

The time charter to scheduled to begin in the first quarter of 2023 and last for a period of three years with an option to extend up to five years.

"This deal marks another major achievement in Avenir's development as we fix the last vessel in our current newbuilding programme. We are thrilled to welcome a world-class organisation like Shell as the latest customer for Avenir LNG," Mackey added.

The vessel will be chartered by

Shell subsidiary Shell NA LNG and the *Avenir Achievement* will be equipped with Boil-Off-Gas reliquefaction and simultaneous operations (SIMOPs) capabilities.

The charter deal including options brought Avenir's overall vessel charter revenues backlog to US\$81.0 million a spokesperson for the firm said, adding that the vessels advanced technology made it "the world's largest, most efficient and versatile LNG Bunker Supply Vessel." In January this year, the firm's bunker vessel *Avenir Aspiration* completed its first LNG supply operation at the Higas LNG terminal in Sardinia.

Tosca bunker first

Headquartered in the London, Avenir LNG is a fully integrated small-scale LNG distributor, supplying LNG to off-grid industry, power generation and marine transport. Last year, the firm completed its first LNG ship-to-ship



Avenir LNG vessel

operation at the anchorage area of Pengerang in Malaysia. The 7,000 deadweight-tonne product tanker *MT Tosca* was refuelled by the bunker vessel *Avenir Advantage*, in collaboration with fuel specialist Liquind Marine.

Christian Schneider, managing director of Liquind Marine, praised the "successful execution" of the firm's first LNG bunkering outside of Europe, stating "we have clearly shown our commitment to

supporting our customers in their transformation towards using more sustainable fuels. Our commitment is not limited to areas where we have own infrastructure but includes partnerships and the use of third-party assets."

The operation was the first collaboration between the companies and was completed in partnership with Malaysian energy firm Petronas which operates the *Advantage*. ■

Newbuild demand propels Svanehøj orderbook

Danish pump specialist Svanehøj has reported that soaring demand for LNG-fuelled newbuilds last year resulted in a four-fold increase in sales of fuel pump solutions, with further steep growth forecast.

The firm saw demand for LNG dual-fuel shipbuilding boost its order intake to almost US\$122 million, a 50 per cent increase over the previous record set in 2014.

"We see a significant increase in orders of fuel pump systems for LNG-fuelled boxships, cruise ships and PCTC vessels. Furthermore, we have received a very large number of orders for LPG carriers, where we supply pump systems for both cargo and fuel," Søren Kringelholt Nielsen, CEO of the firm commented.

Shipbuilding demand

Svanehøj manufactures a variety of pump solutions for LNG-fuelled vessels and signed major contracts with Samsung Heavy Industries and Daewoo Shipbuilding & Marine En-

gineering last year. These agreements involved LNG fuel pump systems for 22 Ultra Large Container Vessels and Kringelholt predicts they are the first of many.

"We see clear indications that many of the ships to be built in the coming years will be built to run on LNG. Therefore, we expect further growth in this segment", Nielsen notes.

Headquartered near Aalborg in the north of Denmark, Svanehøj has a history as a pump maker that stretches back almost a century and today specializes in designing multi-gas pumping systems for sustainable solutions.

Doubling turnover

This year, the firm launched a new strategy with a target to



Svanehøj workers

double its turnover to US\$152 million by 2026. In addition to fuel pumps for LNG, LPG, and future synthetic e-fuels, the firm also sees great potential in developing pump solutions for the infrastructure to be built around Power-to-X and carbon capture and storage (CCS).

"A market for new fuel types will emerge, driven by the large-scale investments in Power-to-X," Nielsen comments. "We have already taken this into account with our fuel pump, which is fully compatible with e-fuels such as green

ammonia and methanol. In this way, we address shipowners' uncertainty with a future-proof pump solution. Regardless of the propellant."

The firm recently signed a contract with a Fuel Gas Supply System (FGSS) integrator in Japan to deliver fuel pumps for six LNG-fuelled Pure Care and Truck Carriers. The FGSS will install the systems on behalf of NYK, as part of the shipping lines strategy to switch to LNG fuel as a bridge solution until future zero-emission ships can be realised.



Denmark's Svanehøj boosts LNG business with new acquisition

LNG Journal Subscription Package



LNG Journal is a ten-in-one subscription product with end-to-end insight into liquefied natural gas. The LNG Journal platform includes:

LNG JOURNAL	Monthly Online + optional print magazine
LNG UNLIMITED	Online every Tuesday + PDF
GAS TO POWER JOURNAL	Online every Friday + PDF
LNG MARKET TRACKER	Online every Wednesday + PDF
LNG SHIPPING NEWS	Online every second Thursday + PDF
LNG MONTHLY MARKETS	Online Monthly + PDF
LNG CHINA	Online every second month + PDF
LNG NORTH AMERICA	Online every second month + PDF
LNG FUELLING	Online every quarter + PDF
DAILY UPDATES and Newsletters	

Subscription Contacts

For new subscriptions or general subscription queries please contact:

Stephan Venter | venter@lngjournal.com
+44 207 017 3407

To renew an existing subscription or to upgrade your package, please contact:

Gabi Weck | gabi@lngjournal.com

Sign up now for an Online Subscription from only US\$1095; €835 or £755

Discount options are available for multi-users

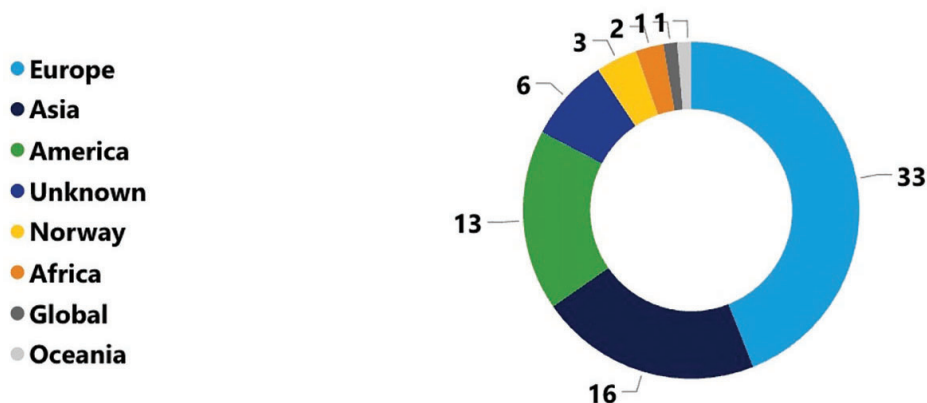
Contact us for more information or to arrange a free trial

LNG BUNKER VESSELS

Vessel Name	Home Port	Project status	Delivery year	Country	LNG Tank Capacity	Owner	Operator
Yidu inland river LNG bunker barge	Yidu port	In operation	2014	China	500	Xilan Natural Gas Group	Xilan Natural Gas Group
Gas Vitality	Marseille	In operation	2021	France	18600	MOL	V Ships
FlexFueler 001	Amsterdam	In operation	2019	Netherlands	1480	Titan LNG	Titan LNG
FlexFueler 002	Antwerp	In operation	2021	Belgium	1480	Titan LNG	Titan LNG
Titan Hyperion	TBD	Decided	2022	Netherlands	8000	Titan LNG	Titan LNG
Titan Krios	Zeebrugge	Under discussion	2023	Belgium	4200	Titan LNG	Titan LNG
PRO1	Houston	Under discussion	Q42022	United States	7600	LNG PRO Bunkers	TBN (Probunkers group company)
PRO2	Hong Kong	Under discussion	Q12023	Hong Kong	7600	LNG PRO Bunkers	TBN (Probunkers group company)
Coralius	Risavika	In operation	2017	Norway	5600	Sirius Veder Gas	Sirius Rederi
Coral Methane	Rotterdam	In operation	2018	Netherlands	7551	Anthony Veder	Shell
Crowley/Shell LNG bunker barge	U.S. East Coast	Decided	2024	United States		Crowley Maritime Corporation	Shell
New Frontier1	Rotterdam	In operation	2017	Netherlands	6500	Shell	Shell
SeaspanLNG bunker vessel	Vancouver	Under discussion	2023	Canada	7600	SeaspanLNG	SeaspanLNG
Petronas LNBV		Under discussion	2024	Malaysia	13000	Petronas	Petronas
Peninsula/Enagas LNG bunker vessel	Port of Algeciras	Decided	2023	Gibraltar	12500	Peninsula/Enagas	Peninsula/Enagas
Green Zeebrugge	Zeebrugge	In operation	2017	Belgium	5200	NYK	NYK
Kairos	Lithuania	In operation	2018	Lithuania	7500	Bernhard Schulte	Nauticor
Naturgy LNG bunker vessel	Barcelona	Under discussion	2022	Spain	6000	Naturgy	Naturgy
Gas Agility	Northern Europe	In operation	2020	Netherlands	18600	Mitsui OSK Lines Ltd	Mitsui OSK Lines Ltd
SM JEJU LNG2	Busan	In operation	2020	South Korea	7500	Korea Line	Korea Line
Korea Gas (KOGAS) LNG bunker vessel		Decided	2023	South Korea	7500	KOGAS	KOGAS
Pioneer Knutsen		In operation	2020	Norway	1100	Knutsen OAS Shipping	Knutsen OAS Shipping
LNG bunker barge shell	Barcelona	Decided	2022	Spain	5000	Scale Gas / Knutsen JV	Knutsen OAS Shipping
Q-LNG 4000	Port Canaveral, FL	In operation	2020	United States	4000	Q-LNG	Harvey Gulf International Marine
Q-LNG ATB Bunker Barge 8000	TBD	Under discussion	TBD	United States	8000	Q-LNG	Harvey Gulf International Marine
Dmitry Mendelev		In operation	Q3 2021	Europe	5800	Shturman Koshelev LLC	Gazpromneft Marine Bunker Ltd
FueLNG Bellina	Singapore	In operation	2020	Singapore	7500	FueLNG (JV Keppel and Shell)	FueLNG
Fratelli Cosulich Mediterranean Sea	Mediterranean Sea	Decided	2023	Italy	8000	Fratelli Cosulich	Fratelli Cosulich LNG
Fratelli Cosulich Mediterranean Sea 2	Mediterranean Sea	Decided	2024	Italy	8000	Fratelli Cosulich	Fratelli Cosulich LNG
Clean Jacksonville	Jacksonville Jax LNG	In operation	2018	United States	2200	TOTE	FOSS Maritime
Xiniao Putuo Hao	Zhoushan	Decided	2022	China	8500	ENN Energy	ENN Energy
Optimus		In operation	Q4 2021	Europe	6000	Eesti Gaas	Elenger
Ecobunker Tokyo Bay	Yokohama	Decided	2022	Japan	2500	Ecobunker shipping	Ecobunker shipping
Kaguya	Chubu region (Central Japan)	In operation	2020	Japan	3500	CLS (JV established by K Line, JERA, NYK and Toyota Tsusho Corp.)	CLMF (JV by CLS partners)
Oizmendi	Huelva	In operation	2018	Spain	600	Cepsa	Cepsa
Seagas	Stockholm (Louden)	In operation	2013	Sweden	187	Gasum	AGA
Avenir Accolade		In operation	2021	Brazil	7500	Avenir LNG	
Avenir Achievement	Caribbean-US Region	Decided	Q2 2022	America	20000	Avenir LNG	
Avenir Advantage		In operation	2020	Malaysia	7500	Avenir LNG	
Avenir Allegiance	Not yet decided (being built in China)	Decided	2022	China	20000	Avenir LNG	
Avenir Ascension	Oristano, Sardinia	Decided	2022	Europe	7500	Avenir LNG	
Avenir Aspiration	Oristano, Sardinia	In operation	2021	Europe	7500	Avenir LNG	
Bergen LNG	Bergen	In operation	2021	Norway	850	Bergen Tankers	

Vessel Name	Home Port	Project status	Delivery year	Country	LNG Tank Capacity	Owner	Operator
Brassavola	Singapore	Decided	2022	Singapore	12000	Mitsui OSK Lines Ltd	
Bunker Breeze	Algeciras	In operation	2018	Spain	1200	Suardiaz Energy Shipping	
Clean Canaveral	Jacksonville, FL	In operation	2021	United States	5400	Polaris New Energy	
Coral Anthelia		In operation	2013	Jamaica	6500	Anthony Veder	
Coral EnergICE	Risavika	In operation	2018	Europe	18000	Anthony Veder	
Coral Energy	Risavika	In operation	2013	Europe	15000	Anthony Veder	
Coral Favia		In operation	2010	Russia	10000	Anthony Veder	
Coral Fraseri	Unknown	In operation	2019	Global	10000	Anthony Veder	
Coral Fungia		In operation	2011	Russia	10000	Anthony Veder	
Coral Furcata		In operation	2011	--	10000	Anthony Veder	
Cryopeak LNG	Vancouver	Under discussion	2022/3	Canada	4000	Cryopeak	
DEPA Limassol	Limassol	Under discussion	2022	Greece	4000	DEPA	
DEPA Piraeus	Piraeus	Under discussion	2022	Greece	4000	DEPA	
Domestic LNG Bunkering Vessel in China	To be decided (China)	Decided	2024	China	12000	CNOOC	
Domestic LNG Bunkering Vessel in China	To be decided (China)	Under discussion	2024	China	6000	CNOOC	
FlexFueler 003	Zeebrugge	Under discussion	TBD	Belgium	1480	Titan LNG	
FlexFueler 004	Lubeck	Under discussion	TBD	Germany	1480	Titan LNG	
FSU and Bunker Barge	Port of Coega/Algoa Bay	Decided	2022	South Africa	144994		
FSU and LNG Bunker Barge, Port of Coega, South Africa	Port of Coega	Decided	2022	South Africa	10000	DNG Energy	
Kanfer Shipping LNG bunker vessel 1	Not yet decided	Decided	2023	--	6000	Kanfer Shipping	
Kanfer Shipping LNG bunker vessel 2	Not yet decided	Decided	2023	--	6000	Kanfer Shipping	
LNG bunker barge GALP		Decided	2022	Portugal		GALP	
LNG bunker vessel Swinoujscie	Swinoujscie	Under discussion	2023	Poland		Polskie LNG	
LNG London	Rotterdam	In operation	2019	Netherlands	2998	LNG Shipping (Victrol & Sogestran)	
Polaris ATB No. 2	Jacksonville, FL	Decided	2024	United States	5500	Polaris New Energy	
Port of Algeciras LNG-Bunkering Vessel	Port of Algeciras	Under discussion	2023	Spain	12500	Enagás	
Poseidon Med II bunkering barge	Revithoussa	Decided	2022	Europe	4000	Venture led by DEPA	
Shell LBV	Singapore (tbc)	Decided	2022	Singapore	18000	Korea Line LNG	
Shell LBV Gulf of Mexico	Gulf of Mexico	Decided	2023	United States	18000	Pan Ocean	
SM JEJU LNG1		In operation	2019	--	7500	Jeju LNG 1 SA	
Small LNG bunkering vessel in South Korea		Decided	2023	South Korea	500	Ministry of Oceans and Fisheries	
Woodside Western Australia LNG bunker vessel	Dampier	Under discussion	2023	Australia	12000		

BUNKER VESSELS BY AREA OF OPERATION



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 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

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
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	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	Xin Ao Pu Tuo Hao	8,500	LNG	China	Yes	ENN
2021	Avenir Ascension	7,500	LNG		Yes	Avenir LNG
2021	Avenir Allegiance	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	PE TBN	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	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
2023	Cryopeak TBA	4,000	LNG	West Canada	Yes	Cryopeak
2023	Knutsen 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
2023	Krios	4,200	LNG	Benelux	Yes	Titan LNG
2023	Fratelli Cosulich TBN	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	K Line TBN	18,000	LNG	Korea	Yes	K Line
2023	PNE TBN	5,500	LNG	USG	Yes	PNE
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2024	TBN	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	???
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG