

LNG Fuelling

AN LNG JOURNAL PUBLICATION

1st Quarter 2023

German Federal Ministry invests in LNG bunker vessels

The German government is to invest €62 million for the construction of three LNG bunker vessels by shipbuilder Flensburger Schiffbau Gesellschaft (FSG).

The new bunkering vessels will receive the grant funding from the Federal Ministry for Economic Affairs and Climate Action and will be developed by a consortium of shipping firms that includes Nordic Hamburg, Titan Clean Fuels and WESMAR.

"The maritime sector's energy transition and its associated switch to alternative fuels are a huge task," Federal Minister for Economic Affairs and Climate Action, Robert Habeck, commented. "It requires investments in the expansion of bunker infrastructure which will enable the refuelling of maritime vessels with LNG and renewable fuels. I am delighted that, thanks to the efforts of all those involved in the project, we have succeeded in realising the funding of three new innovative bunker vessels."

LNG mandate

The funding uplift from government follows a difficult year for German gas buyers as the Russian invasion of Ukraine disrupted traditional pipeline flows and forced industry to turn to LNG imports *en masse*.

Under the terms of the ministry funding, three bunker vessels,



Federal Ministry for Economic Affairs and Climate Action

each with a capacity of 4,500 cubic metres, will be constructed. They will be used to supply LNG to adjacent vessels in German and European seaports.

"The aim of the project is to build modern and sustainable bunker infrastructure for maritime vessels. The legal basis for all support granted is the Funding programme for the construction of refuelling vessels for LNG and sustainable and renewable fuel alternatives in shipping," the ministry states.

Grant approvals were finalized in December, with the refuelling ships due to be built by 2026. Headquartered in Flensburg, the northernmost district-free city in Germany, Flensburger Schiffbau-

Gesellschaft (FSG) dates to 1872 and specializes in construction of commercial and military vessels.

Significant new capacity

New bunker infrastructure planned for northern Germany is expected to add significant capacity for LNG and liquified biomethane (LBM) initially, and further in the future for synthetic natural gas (SNG), according to projections in from the ministry. The three new bunker vessels will all be designed to facilitate fuel switching where possible or via upgrade.

"Ammonia could take on an important role in the long-term as a climate-friendly marine fuel because it can be efficiently produced via regeneration and its consumption is carbon-free," Habeck notes, "The use of ammonia as marine fuel, however, requires further technological and regulatory developments."

The Ministry will be supported in its aims to expand clean fuel bunkering by the Federal Office for Economic Affairs and Export Control, with additional specialist support from The National Organisation for Hydrogen and Fuel Cell Technology (NOW).



Flensburger Schiffbau-Gesellschaft shipyard

FUELLING NEWS AGENDA

MARKET

Rotterdam Q4 LNG bunker sales slump

2

PROPULSION

Wärtsilä to supply LNG systems for four PIL boxships

3



ROAD TRANSPORT

Pitpoint.LNG opens Alsfield LNG station

4

DESIGN

Accor, Chantiers de l'Atlantique plan record LNG yacht

5

NEWBUILDS

Anglo American expands LNG-fuelled Ubuntu fleet

7

COMMISSIONING

Knutsen, Scale Gas launch first Spanish built LNG bunker vessel

8

AUSTRALASIA

Oceania, PCF plan Hedland LNG bunker hub

9

INVESTMENT

Arroyo takes stake in Seaside LNG

11



SHORT SEA

TT-Line expands fleet with LNG-fuelled Peter Pan

12

LNG ORDERBOOK

LNG bunker vessels

13

LNG small scale fleet

14

Rotterdam Q4 LNG bunker sales slump

LNG bunker fuel sales at the Port of Rotterdam slumped in the fourth quarter, as demand collapsed, according to the latest figures from the Rotterdam Port Authority.

The authority reports LNG bunker sales of 34,412 cubic metres in the fourth quarter of 2022, down from 94,454 cubic metres in the same period the previous year, a decline of more than 63% year on year.

Surging demand for LNG in Europe, in the wake of the Russian invasion of Ukraine, drove prices higher and appears to have dampened enthusiasm for LNG as a bunkering fuel at the Netherlands' largest port.

Biofuel-blended fuel demand grows

Across 2022 as a whole, LNG bunker sales at the port were 328,089 cubic metres, only a little over half the volume of 603,690 cubic metres reported for 2021. Despite the lacklustre perfor-

mance of LNG, the port saw strong bunkering activity overall.

Shipping operators at the port bunkered significantly more fuel in Rotterdam in 2022, with combined demand for fuel oil, gas oil, methanol and LNG up 6.3% compared to 2021. This equated to 10.8 million cubic metres across all fuel types in 2022.

"Notable was the increase in demand for biofuel-blended bunkers. Demand rose from 301,000 tonnes to 790,000 tonnes. For the first time, some sea-going vessels bunkered methanol, but from the summer of 2023, sea-going vessels will arrive on a regular basis to bunker this fuel," a port authority spokesperson said.

Despite the slump, the port continues to drive forward a strategy

to support wider LNG and biofuel bunkering, as it sees LNG prices falling at the start of 2023 and prepares for a less volatile year ahead.

Record global LNG imports

Worldwide LNG imports hit a record high in 2022, rising to 409 million tonnes last year from 386.5 million tonnes in 2021, with wealthy European countries leading the way in securing contracts for the year ahead.

As part of the port authority's plans, it will increase carbon measurement processes to support shippers in meeting new IMO Carbon Intensity Indicator (CII) and Energy Efficiency eXisting ship Index (EEXI) regulations.



Rotterdam LNG terminal

"Two years after the introduction of the bunker licence for bunker fuel suppliers in Rotterdam, the Port of Rotterdam Authority and the Antwerp-Bruges Port Authority announced late last year that it will make bunker measuring systems mandatory," a port authority spokesperson added. "With the measure, the port authorities aim to make the ARA bunker market more transparent, efficient and reliable."

World's largest LNG bunkering vessel completes debut refuelling

The world's largest LNG bunkering vessel has completed refuelling operations at Yantian Port in China, marking the first bonded LNG bunkering in the southern Chinese region.

The *Hai Yang Shi You 301* was delivered by Guangzhou Shipyard International in late 2022, following retrofit work to transform it from an LNG carrier to a functioning bunker vessel.

"Providing LNG refuelling services for ships powered by LNG is an important basis for boosting the development of LNG fuel ships," Xie Junpeng, general manager of Guangzhou Wenchong

Dockyard, said, adding that LNG has now become 'the primary choice' to replace fuel oil for marine power.

Record bunkering operation

The *Hai Yang Shi You 301* bunkered LNG fuel to the dual-fuel container ship *CMA CGM Concorde*, one of a new fleet of Ultra Large Container Vessels (ULCV) that have been

built with a primary focus on using LNG.

"The CMA CGM Group has been acting to protect the environment for many years. It is at the heart of

my convictions and of our strategy," Rodolphe Saadé, Chairman and CEO of the CMA CGM Group, said, commenting that the group had "already begun to respond to climate change by using LNG as a transitional maritime fuel."

The arrival of the *Hai Yang Shi You 301* is expected to enhance the competitiveness of Yantian Port and play a major role in government plans to make the region a centre for further LNG development.

Measuring 184.7 metres in length and with a moulded breadth of 28.1 meters, the *Hai Yang Shi You 301* can load more than 30,000 cubic metres of LNG. The vessel is owned by State-owned CNOOC.

Built in 2021, the *CMA CGM*

Concorde has gross tonnage of 236,583 tonnes and sails under the flag of France.

Accelerating the energy transition

Last year, CAM CGM announced a US\$1.5 billion investment fund designed to accelerate decarbonization across its operations and allocated a sizeable portion of this budget to new LNG and alternative fuelling projects.

"This fund will enable us to make substantial investments in innovative projects to decarbonize our business," Saadé said. "We have allocated the resources needed to accelerate our energy transition and that of the entire shipping and logistics industry."



Hai Yang Shi You 301

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

David Jeffries
+44 (0)20 8150 5293
djeffries@lngjournal.com

Subscriptions

Stephan Venter
Tel: +44 (0) 20 7253 2700
venteri@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."

Wärtsilä to supply LNG systems for four PIL boxships

Finnish engine manufacturer Wärtsilä is to supply the LNG fuel control and propulsion systems for four new container ships under construction by Jiangsu New Yangzi Shipbuilding yard in China.

The four new dual-fuel vessels will each have capacity for 8,200 teu and are on order by Singapore-based Pacific International Lines (PIL).

“We are grateful and pleased to be selected for this project. Our experience and market leading position in the LNG segment was a key factor in securing this new order. Our design also prepares for ammonia fuel, which is an important consideration for these ships,” said Harald Øverland, Sales Manager for Fuel Supply Systems and small scale and bunker vessels, said.



PIL container ship

Integrated propulsion control

Wärtsilä will supply its proprietary Fuel Gas Supply System (FGSS) which will include includes boil-off gas management and bunkering stations, as well as a Fuel Control System (FCS). An integrated propulsion control system (PCS) and alarm monitoring and control system (MCS) will also be installed.

“Our strategy is always to build the most optimised, efficient and integrated vessels possible. For this, we have opted to fit these new vessels for PIL with various technologically advanced and highly reliable Wärtsilä solu-

tions. Wärtsilä also provides valuable customer support through its global service network,” said Mr. He Minghui, Assistant General Manager, Jiangsu New Yangzi Shipbuilding.

All of the ships will be fitted with 7,500 cubic metre membrane tanks to feed main and auxiliary engines.

Highly reliable

Headquartered in Helsinki, Finland, Wärtsilä’s manufactures a range of combustion engines and solutions used across industry, with a focus on future-fuel enabled balancing power plants, hybrid solutions, energy storage

and optimisation technology, and the GEMS energy management platform.

“Our strategy is always to build the most optimised, efficient and integrated vessels possible. For this, we have opted to fit these new vessels for PIL with various technologically advanced and highly reliable Wärtsilä solutions,” He Minghui, Assistant General Manager, Jiangsu New Yangzi Shipbuilding, commented.

The MCS and PCS form part of Wärtsilä’s NACOS Automation platform portfolio and will be complemented by ongoing customer support through Wärtsilä’s global service network. ■

NEWS NUDGES

GSI receives LNG PCTC orders

Chinese shipbuilder Guangzhou Shipyard International (GSI) has secured orders to build LNG-fuelled pure car and truck carriers (PCTC) from H-Line Shipping and BYD Group.

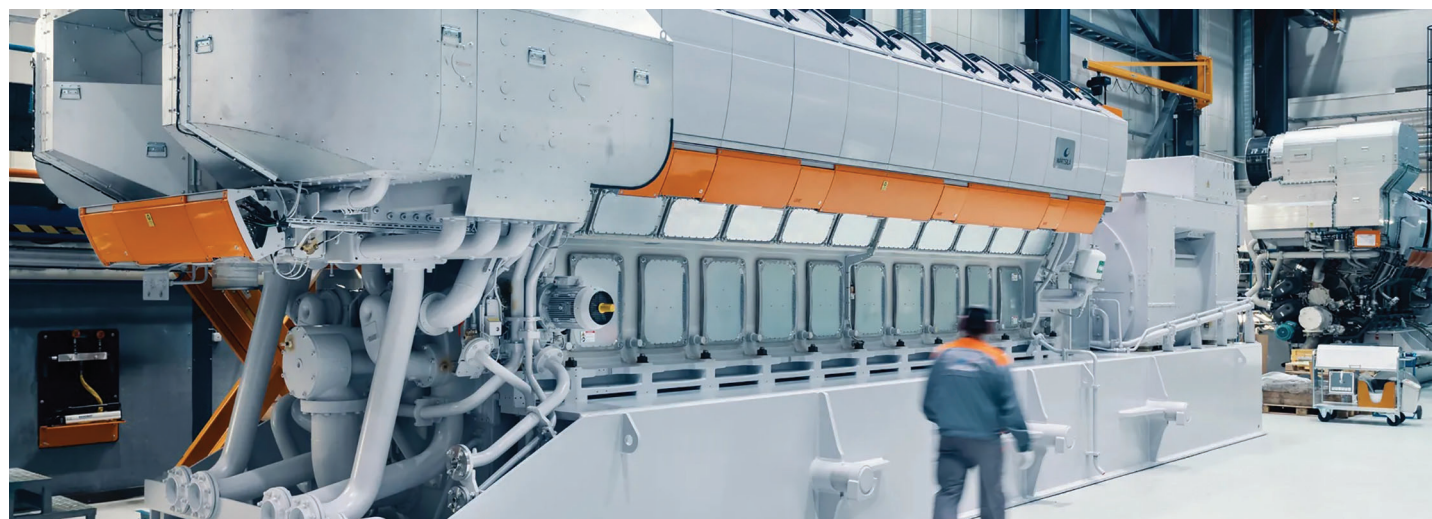
The orders include two LNG dual-fuel PCTCs for H-Line with a capacity of 8,600. The vessels will be chartered to Hyundai Glovis.

Tote hits North American bunkering milestone

Fuelling specialist Tote Maritime has completed the 300th operation with its bunker vessel, *Clean Jacksonville*, the first LNG bunker barge in North America.

The milestone was completed at Jax LNG in Florida by subsidiary Tote Services which operates the barge. The *Clean Jacksonville* also supplies Tote’s Marlin class LNG-powered vessels in Jacksonville, Florida.

The *Clean Jacksonville* was built by Conrad Industries and features a single GTT LNG tank with capacity of 2,200 cubic metres. ■



Wärtsilä propulsion system

Pitpoint.LNG opens Alsfeld LNG station

Gas infrastructure firm Pitpoint.LNG has opened a new LNG refuelling station at Autohof Pfefferhöhe in Alsfeld, Germany.

Operations at the facility commenced in January and the site is equipped with two LNG dispensers, extra cold LNG especially for Volvo Trucks, and refuelling instructions in various languages.

"In addition to LNG, truck drivers will also find Diesel, Ad-Blue and Petrol," a spokesperson for Pitpoint.LNG said, adding that "the truck stop has several facilities like multiple restaurants, a hotel, toilet and shower, 80 parking spots and soon to come a laundry service."

The new station is part of a strategy by the firm to create a European LNG fuelling network for heavy-duty transport and has been selected for its central location on key transit routes, especially between Basel, Switzerland, and Rotterdam, the Netherlands.

LNG training alignment

Last year, the group welcomed a change in Dutch law that meant

that operators of LNG stations are no longer responsible for the LNG truck driver being properly trained to refuel LNG.

"These regulations are now aligned with the regulations in most European countries," a company spokesperson said. "The operator of the LNG stations stays responsible for ensuring safe operations within the LNG station; the operator is responsible for ensuring that LNG installation is only available to users with an exclusive fuel card which has been opened for LNG."

250th bunkering

A joint venture between oil supermajor TotalEnergies and Dutch energy solutions provider SHV, Pitpoint.LNG has developed a wide network of LNG stations across Europe. The firm currently operates eleven LNG stations for trucks in the Netherlands, Belgium and Germany and an LNG refuelling sta-



PitPoint.LNG station Alsfeld, Germany

tion for inland waterway vessels in Cologne, Germany.

In early 2023 celebrated its 250th bunkering at its LNG bunker station in Cologne.

Longer term the firm aims to transition from LNG to bioLNG, calling the fuel 'one of the most promising sustainable solutions for the foreseeable future'.

NGVA rebrands as Gmobility; reports LNG network growth

The Natural & bioGas Vehicle Association (NGVA) Europe has rebranded as Gmobility to better represent the swift development of natural gas vehicle infrastructure in Europe.

The body, which was founded in 2008, and includes members from across the gas and vehicle manufacturing supply chain also launched a new Gmobility cam-

paign, highlighting the central role that bioCNG and bioLNG are expected to play in European transport systems of the future.

"Over the past 15 years, NGVA

has been part of many transformations in the transport industry, including the swift development of natural gas vehicle infrastructure in Europe," Secretary General Matthias Maedge said. "Now, it is time to look into the future that is carbon neutral and completely renewable."

European LNG fuelling network hits new record

The industry association also recently announced that the European network of LNG fuelling stations hit a new record high in January, with a total of 635 stations across the continent. Highlighting the rapid growth in infrastructure in Europe in recent years, an estimated 50 LNG fuelling stations were added to the

map since late September 2022.

Europe is also home to an estimated 4159 compressed natural gas (CNG) fuelling stations, according to the association, making it one of the most advanced gas-refuelling regions in the world.

"Under the new name, we look forward to continuing the work with the EU, the industry, and the civil society to ensure that we use the full potential of Gmobility," Maedge added.

Germany remains the country with the largest number of LNG fuelling stations, hosting 162 in total. This is followed by Italy with 130 LNG filling stations, Spain with 90, France on 70, the Netherlands at 33, Sweden at 28, Belgium at 26, Poland at 24, Finland at 15, and the UK with 14.



LNG fuelling station

Accor, Chantiers de l'Atlantique plan record LNG yacht

French shipbuilder Chantiers de l'Atlantique has partnered with luxury hotel group Accor to develop a novel hybrid vessel, combining wind power and LNG, that is expected to be the world's largest sailing ship.

The new ship, the *Orient Express Silenseas*, aims to push 'the limits of what is possible' and will be built based on a concept design created by Chantiers de l'Atlantique in 2018.

"With a signed letter of intent to order two ships, Chantiers de l'Atlantique is proud to herald a new era in the shipbuilding industry with *Silenseas*," Laurent Castaing, Managing Director of Chantiers de l'Atlantique, comments, calling the concept "the quintessence of our savoir-faire in the fields of naval architecture, the construction of sophisticated hulls, as well as the design of luxurious spaces."

Rich Heritage

Taking its name from the famous Orient Express train, the new vessel is expected to hit the water in 2026 and will feature three rigid sails with a surface area of 1,500 meters each. These will be hoisted on a balestron rig, with three tilting masts reaching more than 100

meters high, able to ensure up to 100% of the propulsion in suitable weather conditions.

This wind power system will be complemented with an LNG propulsion system capable of assisting or completely powering the vessel. The designers also aim to future-proof this system by using green hydrogen "once the technology is approved for ocean passenger ships".

"With *Orient Express Silenseas*, we are beginning a new chapter in our history, taking the experience and excellence of luxury travel and transposing it onto the world's most beautiful seas," Sébastien Bazin, CEO of Accor, said. "This exceptional sailing yacht, with roots in Orient Express' history, will offer unparalleled service and refined design spaces, reminiscent of the golden age of mythical cruises."

Stirling Design

Interior layout and decor will be designed by architect Maxime



Orient Express Silenseas

d'Angeac while Nantes-based design company Stirling Design International will handle the exterior architecture.

Once complete, the ship will measure 220 metres in length, with a tonnage of 22,300 UMS. It will feature 54 Suites, two swimming pools including a lap pool, two restaurants and a speakeasy

bar. Topping the extravagant accommodation will be a sprawling 1,415-square-meter Presidential Suite with a 530-square-meter private terrace.

Around 70-80% of financing for the project will come from commercial banks, with the remainder provided by Accor and a majority equity partner. ■



The vessel will feature three rigid sails

NEWS NUDGES

Slow start to 2023 for newbuild orders

The first month of 2023 saw no new confirmed orders for LNG-fuelled ships, according to the latest figures from certification agency DNV.

'The year has come off to a slow start for orders on alternative fuelled vessels, however February is already looking more promising,' said Martin Wold, Principal Consultant in DNV's Maritime Advisory business.

More competitive gas prices in January are expected to boost demand over the course of the year. The total number of LNG-fuelled ships ordered in 2022 fell compared to 2021, from 240 to 222. ■



Gastech



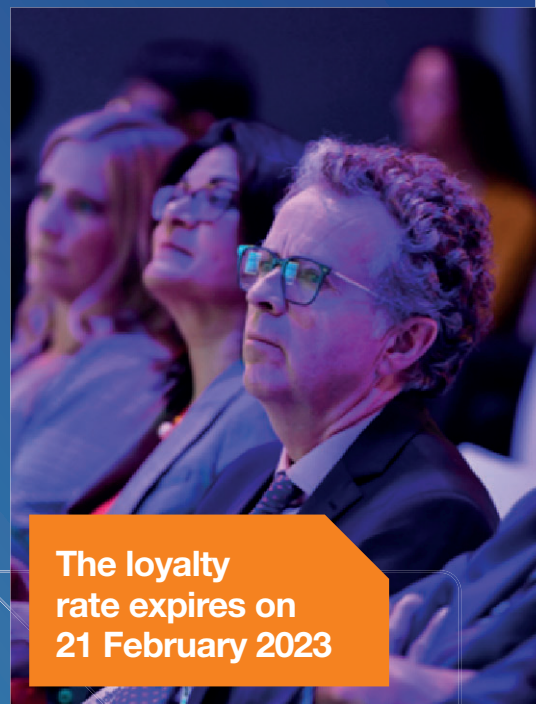
Hydrogen



ClimateTech

EXHIBITION & CONFERENCE
SINGAPORE EXPO | SINGAPORE | 5-8 SEPTEMBER 2023

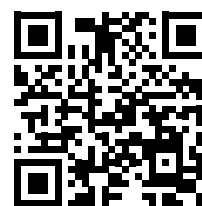
Delegate registration is now open



The loyalty rate expires on 21 February 2023

Book your delegate pass at the loyalty rate to hear from more than 600 expert speakers, including policy makers from the world's leading energy economies, the industry's pre-eminent leaders, and technical experts from the global natural gas, LNG, hydrogen, low-carbon solutions, and climate technologies industries.

SCAN TO REGISTER AS A DELEGATE



delegates@gastechevent.com gastechevent.com @gastechevent #Gastech [in](#) [f](#) [t](#)

4,000
delegates

300+
CEOs, Ministers
and business
leaders speaking

600+
technical and
commercial
speakers

40,000+
international
attendees

100+
countries
represented

Held in



Supported by



Organised by



Anglo American expands LNG-fuelled Ubuntu fleet

Mining giant Anglo American has started operation of the first of its LNG-fuelled *Ubuntu* bulk carriers, built by China's Shanghai Waigaoqiao Shipbuilding (SWS).

SWS launched the first two vessels *Ubuntu Harmony* and *Ubuntu Equality* at a virtual naming ceremony in December and Anglo American loaded the first cargo of iron ore aboard *Ubuntu Harmony* in South Africa in January.

"The metals and minerals we provide play an important role in helping key industries decarbonise," Nolitha Fakude, Group Director of Anglo American for South Africa, said. "Transporting them in a sustainable way is a key part of this effort and the introduction of the Ubuntu fleet - named after the Zulu word meaning 'humanity to others' - helps us accelerate our transition to sustainable ocean freight."

Both vessels are 190,00 dead-weight-tonnes and capable of running on LNG or marine fuel oil.

C-type fuel tanks

Classified by standards agency



Ubuntu Harmony

DNV, the vessels both measure 299.80 metres in length, 47.5 metres in width, and 24.70 metres in depth, with a design draft of 18.25 metres and design draft speed of 14 knots.

"The two vessels are a new generation of dual fuel vessels, of which intellectual property is completely owned by SWS. The two vessels are important achieve-

ments of SWS's overall transition to build green and low-carbon vessels," a spokesperson for SWS said.

Equipped with two C-type LNG fuel tanks, the bulk carriers have fuel gas endurance of up to 20,000 nautical miles, providing capacity for two round-trip routes from China to Australia or one round-trip route from China to Brazil.

"The EEDI is 45% lower than

the baseline, meeting the requirements of IMO Tier IV," a spokesperson for SWS commented. "SWS has successfully delivered six large dual fuel vessels in 2022, including the world's first Newcastle dual fuel bulk carrier and Aframax dual fuel oil tanker, and has mastered the construction techniques of dual fuel vessels."

Net Zero by 2040

The Capesize+ vessels were joined by a further two vessels - *Ubuntu Empathy* and *Ubuntu Humanity* - also built by SWS, and are the first of ten LNG dual-fuelled ships that Anglo American will introduce to its chartered fleet during the course of 2023 and 2024, delivering an estimated 35% reduction in CO2 emissions.

Peter Whitcutt, CEO of Anglo American's Marketing business, said: "We are proud to see the *Ubuntu Harmony* begin its voyage transporting future-enabling products from our mines to our customers around the world. This milestone cements our vision to be a leader in low carbon shipping, a natural extension of our commitment to achieve carbon neutrality across our operations by 2040."

The *Ubuntu* fleet is a key component of the firm's ambition to achieve carbon-neutrality for its ocean freight by 2040, with an interim target to reduce emissions from these activities by 30% by 2030.

“ This milestone cements our vision to be a leader in low carbon shipping, a natural extension of our commitment to achieve carbon neutrality across our operations by 2040 ”

- Peter Whitcutt, CEO, Anglo American Marketing business,



SWS shipyard

Knutsen, Scale Gas launch first Spanish-built LNG bunker vessel

Fuel specialist Scale Gas and shipping firm Knutsen have launched the first LNG bunkering vessel built in Spain, commencing operations at the Barcelona Regasification Terminal.

The new vessel, named *Haugesund Knutsen*, was built by Spanish shipyard Astilleros Armón Gijón, based in the Natahoyo neighborhood of the city of Gijón, and will be operated under charter by Shell Spain.

“The *Haugesund Knutsen* reaffirms Knutsen’s strategic line, which began 15 years ago with the *Pioneer Knutsen*, of betting on small-scale LNG as a tool to reinforce the use of LNG as a marine fuel and thus help in the target of decarbonisation and improvement of the environment in Europe and the Mediterranean,” Trygve Seglem, founder of Knutsen, said.

Public-private partnership

The barge was constructed as part of the European Union’s ‘Connecting Europe Facility’ (CEF) transport aid programme, aimed at strengthening supply chains for a sustainable transport sector.

The CEF programme co-financed €9 million of the development cost via the public-private initiatives CORE LNGas hive and LNGhive2, which involve 21 public partners, including 13 port authorities, and 28 private or industrial partners.

Shell Spain Country Chair, Óscar Fernández, called the launch “a magnificent example of how collaboration between the different players in the sector, together with the support of public administrations, will make it possible to jointly achieve the decarbonisation targets”.

Key role in regional security

The new vessel will bunker LNG at the Port of Barcelona and surrounding region and is expected to play ‘a key role in the region’s security of supply and boosting the use of LNG as the most environmentally friendly fuel for shipping’, according to Enagás, the



Haugesund Knutsen

parent company of Scale Gas.

“The construction of the ship is a step forward in meeting European decarbonisation targets,” Arturo Gonzalo, CEO of Enagás, said, “This initiative is framed within a European project that Enagás is coordinating as part of LNGhive2 strategy, led by Puertos del Estado, aimed at promoting the development of the LNG market as sustainable marine fuel and ensuring supply in ports, in line with European Directive 94/2014

on alternative fuels”.

The new vessel features storage capacity of 5,000 cubic metres, with two bi-lobe tanks of 2,500 cubic metres each, and an LNG supply capacity of 1,000 cubic metres per hour. It has a length of 92.75 metres, a beam of 16.90 metres and a draught of 4.25 metres.

Alongside commissioning the bunker vessel, Enagás also unveiled the adaptation of a Small-Scale jetty at its Regasification Terminal in Barcelona. ■

MOL launches Japan’s first LNG-fuelled ferry

Japanese shipping conglomerate Mitsui O.S.K. Lines (MOL) has launched the *Sunflower Kurenai*, the first of two LNG-fuelled ferries in Japan.

The new ferry entered service in January and will operate on the Osaka-Beppu route between Sunflower Ferry Terminal in Osaka Prefecture and Beppu International Tourist Port in Oita Prefecture.

“It is Japan’s first ferry to adopt the latest environmental-friendly specifications including a high-performance dual-fuel en-

gine, which can run on both LNG and heavy fuel oil,” a spokesperson for MOL said.

Greater capacity

The route is operated by Ferry Sunflower, a subsidiary of MOL, and is expected to reduce emissions of CO₂ by about 25%, and sulphur oxide by virtually 100%.

“Compared to earlier ferries, the new ferry offers greater transport capacity and convenience for both cargo and passenger transport. In freight transportation, it has greater capacity to load trucks and provides a larger, more comfortable room for truck drivers,” MOL said in a statement.

The vessel incorporates several large open public areas onboard, including a three-layer atrium, designed to promote and enhance the company’s ‘Casual Cruise Concept’.

Decarbonized society

The new vessel is one of four new LNG-fuelled ferries ordered by MOL and in the near term will be joined by sister vessel *Sunflower Murasaki*. Following this, two next generation LNG-fuelled ferries are planned to enter service in 2025,

replacing vessels currently plying the Oarai-Tomakomai route operated by MOL Ferry.

“MOL will further expand the adoption of LNG-fuelled vessels, accelerate its efforts to reduce total greenhouse gas (GHG) emissions, and contribute to the realization of a low-carbon, decarbonized society through the concerted efforts of the entire Group,” a spokesperson explained.

A subsidiary of Mitsui, one of Japan’s largest corporate groups, MOL has been a long-term supporter of LNG as a transport fuel, operating multiple LNG-fuelled vessels across its merchant fleet. Since 2017, MOL has operated a dedicated Bunker Business Office in order to accelerate LNG initiatives and solutions for refuelling vessel. ■



The Sunflower Kurenai

Oceania, PCF plan Hedland LNG bunker hub

Sustainable shipping firms Oceania Marine Energy and Pilbara Clean Fuels (PCF) have signed a memorandum of understanding to jointly develop LNG bunkering infrastructure at Port Hedland, Western Australia.

The new hub will be based within the world's largest iron ore export port and aims to create a 'low-carbon footprint' LNG production facility that can convert pipeline natural gas into bunker fuel.

"Oceania and PCF's collaboration heralds the beginning of a new decarbonisation initiative in Western Australia, enabling a much-needed lower-carbon fuel source for shipping," Nick Bentley, managing director of Oceania, said. "The Oceania and PCF collaboration is aimed at providing a supply capability for low-carbon footprint LNG, for the first time available on-route to the Australia Asia iron ore shipping fleets."

Base capacity 0.5 Mtpa

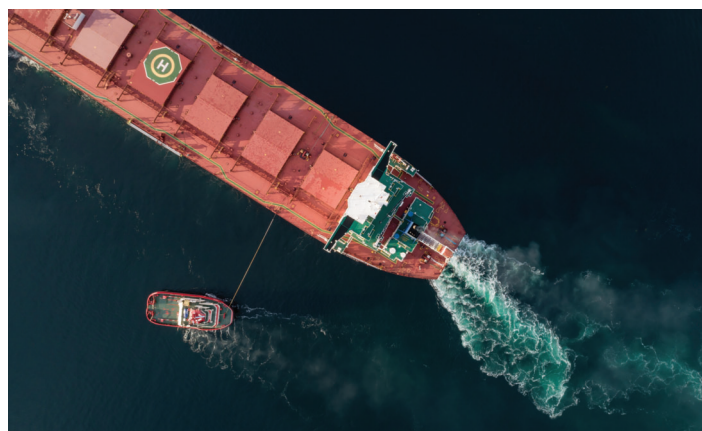
Under the terms of the MoU, PCF will conduct a conceptual study for the plant with a base case capacity of 0.5 million tonnes per annum (Mtpa) and potential to expand to more than 1 Mtpa.

"We are pleased to have formed the collaborative relationship with OME," Robert Malaba, managing director of PCF, commented. "The partnership provides a truly end-to-end development and implementation capability for LNG marine bunkering at Port Hedland. We believe the reduced GHG life-cycle profile of the concept, compared to the status quo, will fuel lively debate among stakeholders concerning the overall economic and environmental benefit and 'value-add' to WA's iron ore resources through this attractive application of the State's natural gas."

Initial plans for the new site will be based on ship-to-ship bunkering of vessels while at anchor off Port Hedland.

Reducing GHG life-cycle emissions

In order to reduce the carbon footprint of fuel from the site,



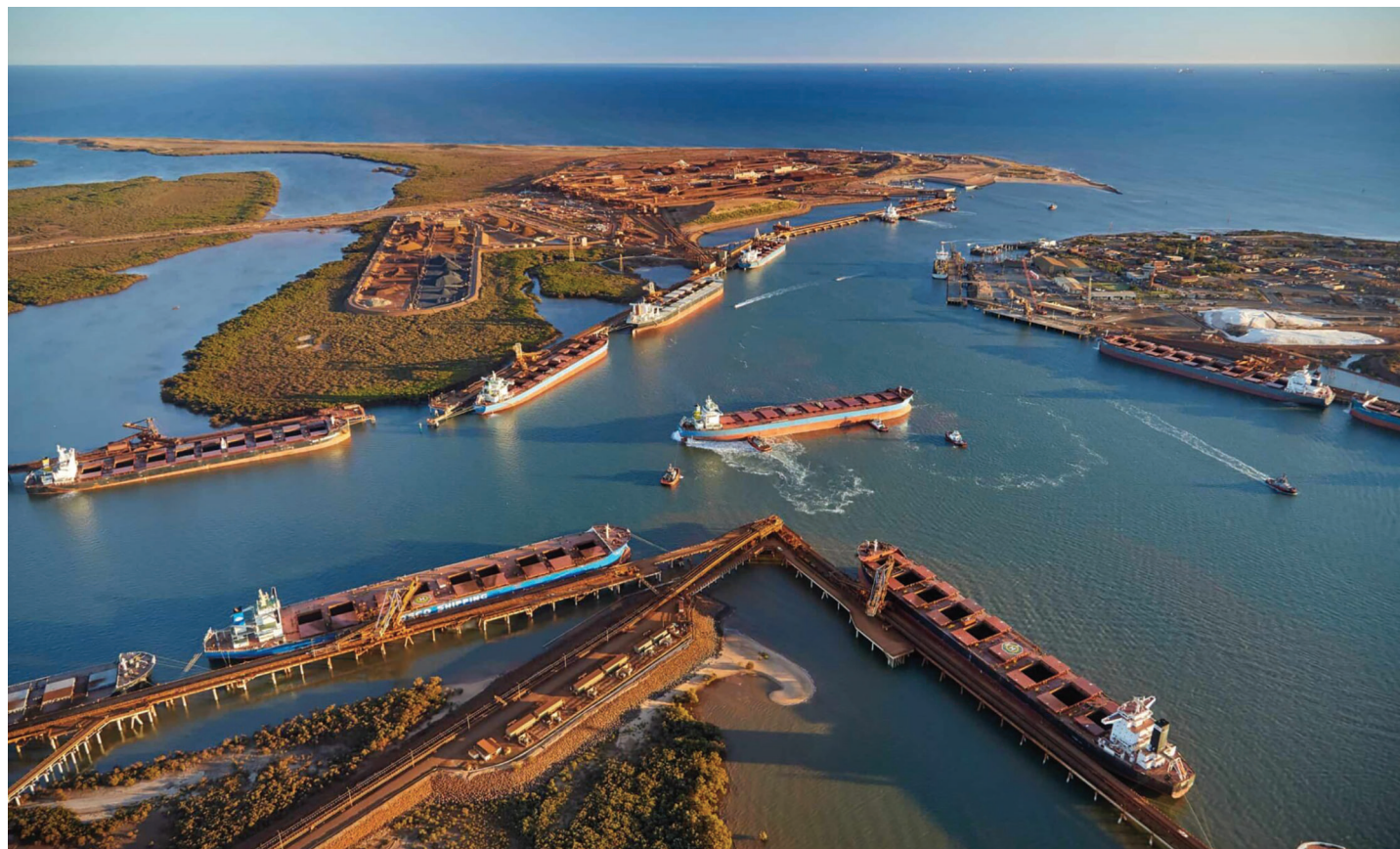
LNG ore carrier refuelling

the partners aim to design a fully electrified plant, with power supplied from renewable sources. The resultant eLNG is therefore expected to have significantly lower overall GHG life-cycle emissions.

In the first phase, Oceania will charter an LNG bunkering vessel to serve the burgeoning fleet of LNG-fuelled iron ore carriers docking at Port Hedland. The purpose-

designed bunker vessel will be chartered from Norwegian LNG specialist Kanfer Shipping as the first step in building Oceania's fuel bunkering business in Western Australia.

"Together we are excited to participate in Australia's primary green corridor for shipping, supporting significant emission reductions across the mining and maritime sectors," Bentley adds. ■



Port Hedland



NEXUS OF CLEAN™

"Chart's vision is to be the global leader in the design, engineering and manufacturing of cryogenic process technologies and equipment for the Nexus of Clean™ — **clean power, clean water, clean food and clean industrials**, regardless of molecule."

A handwritten signature in black ink, likely belonging to Jill Evanko.

JILL EVANKO / CEO / CHART INDUSTRIES

CLEAN
CLEAN
CLEAN
CLEAN

 CHART DELIVERS CLEAN SOLUTIONS FOR



Power



Water



Food



Industrials



Learn more at chartindustries.com

Arroyo takes stake in Seaside LNG

Investment manager Arroyo has acquired a stake in maritime logistics firm Seaside LNG, backing the firm's strategy to develop shore-side LNG liquefaction and bunkering infrastructure.

The partners will target the creation of new LNG platforms and services in the US and build on Seaside LNG's existing liquefaction assets in Jacksonville, Florida.

"We believe this investment represents a differentiated opportunity for Arroyo to own and operate infrastructure assets that are strategically positioned to help facilitate the global marine industry's transition from traditional heavy fuel to cleaner LNG, in compliance with IMO 2020," Brandon Wax, Managing Director at Arroyo, commented.

Headquartered in Texas, Arroyo Investors is an independent investment manager focused on power and energy infrastructure assets in North America and Chile, with nearly US\$2 billion of equity capital investments since inception.

LNG bunkering knowhow

Seaside LNG owns the LNG bunkering barge *Clean Canaveral* via its subsidiary Polaris New Energy. With a capacity of 5,500 cubic meters, it was the largest Jones Act LNG bunker barge when it launched last year and has since completed several landmark refuelling operations in Florida.

"We're excited to help lead the maritime industry's transition to a lower carbon future," Mac Hummel, Chief Executive Officer of Seaside commented. "The environmental benefits of LNG as a next generation fuel for our maritime customers are well established."

Credit Suisse Securities acted as exclusive financial advisor to Arroyo for the deal, financial terms of the investment were not disclosed.



Clean Canaveral bunker barge

Liquefaction capacity

As well as the *Clean Canaveral*, the firm also owns a 50% stake in the JAX LNG liquefaction facility in Jacksonville, which currently has capacity of around 360,000 gallons per day.

"As an economic and environmentally friendly fuel supply alternative, we believe LNG is a key component in the transformation

of the energy landscape and Seaside LNG is well positioned to lead the way by supplying LNG to its customers," Wax added.

Seaside Holdings operates the subsidiaries Northstar Jacksonville and Polaris New Energy. JAX LNG is a joint venture between NorthStar Jacksonville and Pivotal LNG - a subsidiary of BHE GT&S, a Berkshire Hathaway Energy company. ■

Molgas integrates Air Liquide's French fuelling network

Spanish fuel group Molgas Energía has begun the process of integrating 24 refuelling stations into its network, following their acquisition from industrial gas firm Air Liquide.

The purchase strengthens Molgas' growing network in France and is part of a strategy to supply LNG to 'those places that gas pipelines do not reach'.

"With this acquisition Molgas becomes one of Europe's leading suppliers of LNG/CNG/Biomethane for vehicular use," Juan

Menchero, COO at Molgas Energía, said. "Sincere welcome to the employees, clients and providers to Molgas."

Out of the 24 new facilities, 17 operate as dual LNG and CNG refuelling stations. Prior to the acquisition Molgas had more than 50 public gas stations in Portugal,

Spain, France and Italy.

"We take another huge step in the strong European growth momentum of CNG distribution through the integration of Air Liquide's Filling Station network in France," Fernando Breda, Country Manager for Molgas Portugal, said, adding that Molgas network was "strategically distributed by the main European Routes, thus providing our international customers with a wide and unique capillarity in the offer of vehicular natural gas."

LNG value chain

Headquartered in Madrid, Molgas operates across the LNG value chain delivering industrial, cogeneration, vehicular and maritime projects as well as distributing fuel and supplying storage solutions.

The firm has logistic facilities

in each of the main European LNG Terminals and bunkering

ports. It is owned by French private equity firm InfraVia Capital Partners. In November last year, professional services group KPMG advised InfraVia Capital Partners on the refinancing of Molgas, leading to financial close on a debt package of more than €200 million.

This significant funding round included a term loan to refinance existing debt and undrawn capex lines and was backed by a group of lenders including ABN Amro, BNP Paribas, Credit Agricole, Sabadell and Santander.

Rafael Aguilar, partner at KPMG Abogados team, led the advisory team, noting that the funding was "partly expected to be used to finance an expansion into the biogas market, as well as a working capital facility." ■



Air Liquide refuelling station

TT-Line expands fleet with LNG-fuelled *Peter Pan*

German shipping company TT-Line has expanded its LNG-fuelled fleet, with the addition of a new ferry vessel serving Baltic routes.

The new vessel is named *Peter Pan* and moored for the first time at the Skandinavienkai in Travemünde on Germany's Baltic coast at the start of the year. It is the second 'Green Ship' introduced by the Lübeck-based ferry operator and brings the total fleet to nine ships.

"Our goal and our responsibility is to meet the increased demand for transport as green, i.e. as environmentally friendly and energy-saving as possible. Our sustainable investments do not stop with the commissioning of *Peter Pan* but go so far that we are also constantly improving the environmental balance of our existing fleet," Bernhard Termühlen, MD TT-Line, said.

First bunkering in Pengerang Anchorage

The new vessel was delivered from China Merchants Jinling Shipyard in Nanjing at the end of last year, completing its first ship-to-ship bunkering operation in Malaysia in December with the assistance of fuelling specialist Avenir LNG.

Measuring 230 metres in



TT-Line Green Ship *Peter Pan*

length, the vessel has capacity for up to 800 passengers and more than 200 semitrailers, trailers and containers. Its sister vessel, the *Nils Holgersson*, entered service in April last year.

"On board our new ships, we can offer our guests a modern

and at the same time environmentally friendly ferry experience," Andreas Schaerli, COO of says TT-Line, said. "Identical to her sister ship, the new *Peter Pan* also impresses with a well-thought-out interior design. Passengers have at their disposal 245

modern and spacious cabins of different categories."

Energy efficiency

Both of the sister vessels also include a range of technology to maximise energy efficiency and improve fuel consumption, with more than 90% of systems coming from European suppliers. Innovations include energy-efficient air conditioning and heat recovery systems, and LED lighting that consumes 80% less power.

The ships designers have also incorporated artificial intelligence systems to calculate the most efficient speed, based on the weather, draught, water depth, bunker consumption and the expected arrival time.

The new Green Ship is the sixth TT-Line vessel to bear the name *Peter Pan*, with the former *Peter Pan* now renamed as *Tinker Bell*. The firm operates up to 18 departures daily, connecting the German ports of Travemünde and Rostock, with the Polish port of Świnoujście, the Lithuanian port of Klaipėda and Trelleborg in southern Sweden.

“Our goal and our responsibility is to meet the increased demand for transport as green, i.e. as environmentally friendly and energy-saving as possible

- Bernhard Termühlen, MD TT-Line

NEWS NUDGES

China trials fuel tank replacement bunkering

The first successful refuelling of LNG by the novel tank replacement method has been completed in China, with two vessels bunkering fuel in Xuzhou, northwestern Jiangsu province.

The process involved the LNG-fuelled containerships Hongyuan Xuzhou and Hongyuan

Wuhan and replacement of movable fuel tanks, each containing 17 tonnes of LNG.

"This kind of movable LNG fuel tank supplying gas to cargo ships is like replacing batteries for new energy vehicles," Miao Xiaochao, Team Leader of CNOOC Jiangsu LNG Tank Replacing Project Team, reportedly said. "This model is the first in China. The whole process only

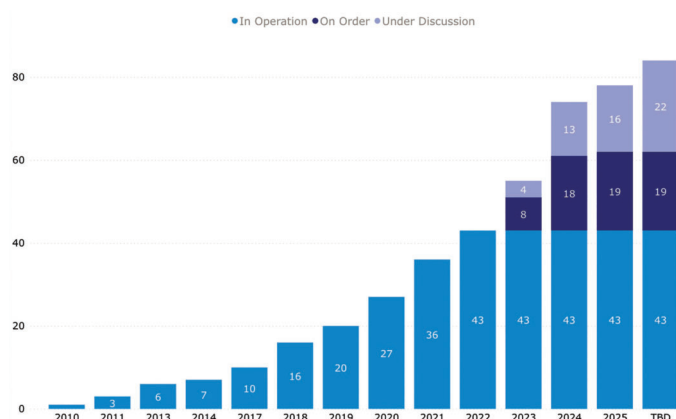
takes 15 to 30 minutes, which is 60% to 70% shorter than the traditional filling method."

The new method is particularly beneficial for inland transport where a lack of available stations on China's main rivers has limited LNG uptake. Following refuelling the ships set sail on the Jiangsu section of the Beijing-Hangzhou Grand Canal.

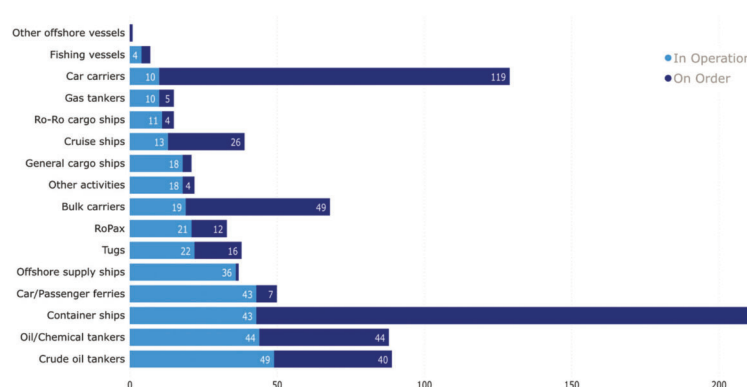
PLANNED NEWBUILD LNG BUNKER VESSELS

Vessel Name	Delivery Year	Project status	Country	Home Port
K LNG Dream	2023	Decided	South Korea	
Korea Gas (KOGAS) LNG bunker vessel	2023	Decided	South Korea	
Shell LBV Gulf of Mexico	2023	Decided	United States	Gulf of Mexico
Fratelli Cosulich Mediterranean Sea	2023	Decided	Italy	Mediterranean Sea
Peninsula/Enagas LNG bunker vessel	2023	Decided	Gibraltar	Port of Algeciras
Korea Line/Shell LBV	2023	Decided	Singapore	Singapore
Brassavola	2023	Decided	Singapore	Singapore
Ecobunker Tokyo Bay	2023	Decided	Japan	Yokohama
OljOla & Stena JV Methanol BV	2023	Under discussion	Europe	Northern Europe
FSU and LNG Bunker Barge, Port of Coega, South Africa	2023	Under discussion	South Africa	Port of Coega
FSU and Bunker Barge	2023	Under discussion	South Africa	Port of Coega / Algoa Bay
Cryopeak LNG	2023	Under discussion	Canada	Vancouver
Crowley/Shell LNG bunker barge	2024	Decided	United States	U.S. East Coast
Seaspan LNG bunker vessel 2	2024	Decided	North America	Vancouver
Seaspan LNG bunker vessel	2024	Decided	Canada	Vancouver
TBN	2024	Decided	China	Yangtze River
Seaspan LNG bunker vessel 3	2024	Decided	North America	Vancouver
Polaris ATB No. 2	2024	Decided	United States	Jacksonville, FL
KEYS Bunkering West Japan LBV	2024	Decided	Japan	Kyushu and Setouchi regions
Fratelli Cosulich Mediterranean Sea 2	2024	Decided	Italy	Mediterranean Sea
Methanol BV	2024	Decided	Singapore	Singapore
Domestic LNG Bunkering Vessel in China	2024	Decided	China	To be decided (China)
Domestic LNG Bunkering Vessel in China	2024	Under discussion	China	To be decided (China)
Titan Krios	2024	Under discussion	Belgium	Zeebrugge
Petronas LNGBV	2024	Under discussion	Malaysia	
LNG bunker barge GALP	2024	Under discussion	Portugal	
Oceania Marine Energy LBV	2024	Under discussion	Australia	Dampier
Eagle LNG caribbean LNGBV	2024	Under discussion	America	Jacksonville, FL
Kanfer Shipping LNG bunker vessel 1	2024	Under discussion	--	Not yet decided
Poseidon Med II bunkering barge	2024	Under discussion	Europe	Revithoussa
Titan Hyperion	2024	Under discussion	Netherlands	TBD
Net Zero hive Canarias	2025	Decided	Spain	Canary Islands
LNG bunker vessel Swinoujscie	2025	Under discussion	Poland	Swinoujscie
Woodside Western Australia LNG bunker vessel	2025	Under discussion	Australia	Dampier
Oceania Marine Energy	2025	Under discussion		Dampier
TBN 3	TBD	Under discussion	Germany	Germany
FlexFueler 003	TBD	Under discussion	Belgium	Zeebrugge
Q-LNG ATB Bunker Barge 8000	TBD	Under discussion	United States	TBD
FlexFueler 004	TBD	Under discussion	Germany	Lubeck
TBN 2	TBD	Under discussion	Germany	Germany
TBN 1	TBD	Under discussion	Germany	Germany

Growth of LNG bunker fleet



LNG fleet by ship type



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	Seapeak Unikum	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 Skargas	Anthony Veder
2017	Coral EnergyICE	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

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
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	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	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	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	???
2024	Keys TBN	3,500	LNG	Japan	Yes	Keys Bunkering West Japan Co
2024	Seaspan TBN 1	7,600	LNG	Canada	Yes	Seaspan ULC
2024	Fratelli Cosulich TBN	8,000	LNG	Mediterranean	Yes	Fratelli Cosulich
2024	Anhui Changjiang TBN	14,000	LNG	China	Yes	Anhui Changjiang LNG
2025	Seaspan TBN 2	7,600	LNG	Canada	Yes	Seaspan ULC
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG