

LNG Transition

LNG AS A TRANSITION FUEL

2nd Quarter 2024

Oman progresses plans for renewable LNG hub

Authorities in Oman have accelerated plans to transform the sultanate into a regional hub for energy transition infrastructure, approving a landmark contract for a project that will combine solar and LNG.

The Engineering, Procurement and Construction (EPC) contract for the Marsa LNG bunkering project was awarded to French engineering group Technip Energies by developers TotalEnergies and OQ. It is valued at between €500 million and €1 billion and will involve development of a natural gas liquefaction train with an LNG production capacity of 1 million tonnes per annum.

"We are proud to open a new chapter in our history in the Sultanate of Oman with the launch of the Marsa LNG project, together with our partner OQ, demonstrating our long-term commitment to the country," Patrick Pouyanné, Chairman and CEO of TotalEnergies, comments.

Renewable power

The design is noteworthy as it will use electric motors, powered by renewable electricity, instead of conventional gas turbines. A dedicated 300 MWp photovoltaic solar plant will be built to cover 100% of the annual power consumption of the LNG plant.

"This very innovative project illustrates our pioneer spirit and showcases the relevance of our

integrated multi-energy strategy, with the ambition of being a responsible player in the energy transition," Pouyanné adds. "By paving the way for the next generation of very low emission LNG plants, Marsa LNG is contributing to making gas a long-term transition energy."

The firm predicts that this will position the facility as 'one of the lowest GHG emissions intensity LNG plants ever built worldwide', with a GHG intensity below 3 kilograms of CO₂ per barrel of oil equivalent (kg CO₂e/boe). This compares with average emission intensity of LNG plants at around 35 kg CO₂e/boe.

"The world's net-zero trajectory will require LNG as a critical source of energy, while addressing emissions abatement," Arnaud Pieton, CEO of Technip Energies, said. "TotalEnergies and OQ's progressive Marsa LNG project is an example of how we can decarbonize the LNG value chain by



Map of Omani LNG development

powering its production with renewable energy and using it as a marine fuel to reduce emissions linked to maritime transportation.

Mabrouk North-East

Under the terms of the Sale and Purchase Agreement signed by the developers, Oman LNG will offtake 0.8 Mtpa of LNG for ten years from 2025. The project will be developed by the joint company Marsa Liquefied Natural Gas, which is 80% owned by TotalEnergies and 20% by OQ.

The new complex will receive feedstock from the Mabrouk North-East field on onshore Block 10, with an estimated flow of 150 Mcf/d of natural gas. It will be built in the port of Sohar and feature a nameplate capacity of 1 million tonnes per year for LNG liquefaction.

"The LNG production is expected to start by first quarter 2028 and is primarily intended to serve the marine fuel market in the Gulf," a spokesperson for the partners said. "LNG quantities not sold as bunker fuel will be off-taken by TotalEnergies and OQ." ■



Artist's rendition of Marsa LNG infrastructure

FUELLING NEWS AGENDA

OUTLOOK

Shell: Asian energy transition to drive LNG surge

2

SUPPLY

DNV warns of LNG supply crunch as global fleet grows

3



DEVELOPMENT

Hapag-Lloyd milestone boosts LNG as transition fuel

4

TECHNOLOGY

AUSEA deploys drones to tackle methane slip

5

REGULATION

EU-ETS scheme to reshape LNG portfolio optimization

7

FLEETS

Seaside LNG adds Tortuga tug to fleet

8

INDIA

Gail invests in LNG fuelling infrastructure

9

US EXPORTS

Japan, US strengthen LNG export ties to support energy transition

11



PORTS

Rotterdam plans Maasvlakte LNG bunkering expansion

12

LNG ORDERBOOK

LNG bunker vessels

13

Shell: Asian energy transition to drive LNG surge

Multinational energy giant Shell has forecast that worldwide demand for LNG will rise by more than 50% over the next decade and a half, as Asia drives uptake of the fuel as part of a global energy transition.

According to the 'Shell LNG Outlook 2024' report, global trade in LNG saw a modest increase to 404 million tonnes in 2023 from 397 million tonnes in 2022, but despite this growth, the market remained constrained by tight supplies, exerting upward pressure on prices and sustaining price volatility above historical averages.

Steve Hill, Executive Vice President for Shell Energy, emphasizes China's pivotal position in driving the market over the coming

decade, noting, "China is likely to dominate LNG demand growth this decade as its industry seeks to cut carbon emissions by switching from coal to gas. With China's coal-based steel

sector accounting for more emissions than the total emissions of the UK, Germany and Turkey combined, gas has an essential role to play in tackling one of the world's biggest sources of carbon emissions and local air pollution."

Infrastructure investment

Looking ahead, declining domestic gas production in regions of South Asia and Southeast Asia is anticipated to fuel a surge in LNG demand, driven by the need for



LNG vessel

gas-fired power plants and industrial applications. However, this trajectory hinges on substantial investments in gas import infrastructure across these regions.

"Gas complements wind and solar power in countries with high levels of renewables in their power generation mix, providing short-term flexibility and long-term security of supply," Hill notes, cautioning that many countries in South Asia and South-east Asia still need 'significant investments' in gas import infrastructure.

Energy security

In the context of European energy security, LNG is forecast to remain a critical part of the picture, cemented by the rapid decline in Russian pipeline exports since 2022. New regasification facilities bolstered energy supply security in

Europe, with LNG imports remaining steady in 2023 despite an overall decrease in gas demand.

"Relatively mild winter temperatures in countries that rely on gas for heating, combined with high gas storage levels, stronger nuclear power generation and a modest economic recovery in China, all helped balance the global gas market in 2023," Hill adds.

Overall, Shell reports that these factors helped bring down and stabilise gas prices in Europe and East Asia last year, compared to the record highs and unprecedented volatility seen in 2021 and 2022. Despite this stabilisation, gas prices and volatility remain at an elevated level when compared to the preceding 2017-2020 period, indicating persistent threats to LNG pathways.

Titan completes first LNG operation in UK

Dutch fuelling specialist Titan has completed its first refuelling operation in the UK, transferring an LNG cargo in Dundee, Scotland.

The bunkering operation was completed on behalf of international infrastructure group Dredging, Environmental and Marine Engineering (DEME) and involved transfer of 345 tonnes of LNG to the vessel *Living Stone*.

"The seamless execution of this operation underscored the efficiency and professionalism of both the Titan crew and the crew of the receiving vessel. The collaboration between the parties involved, including the Dundee port authorities, played a pivotal role in the success of this delivery," Titan said.

Long-term charter

Bunkering was carried out by the

LNG supply vessel *Alice Cosulich*, a barge measuring 113 metres in length, with a moulded width of 20 metres, a moulded depth of 13.5 metres, a design draft of 6.35 metres and a load capacity of about 5,300 tons.

"Fratelli Cosulich launched and christened *Alice* at China's CIMC SOE shipyard at the beginning of 2023," a spokesperson commented, adding that the vessel was now under long-term charter with Titan.

The *Living Stone* is a DP3 cable installation and multipurpose vessel that was built in 2017. The vessel is equipped with a total installed power of 15,810 kW and

has a maximum rock loading capacity of 1,200 cubic metres, alongside an active heave compensated crane capacity of 85 tonnes and a maximum cable hold capacity of 2 x 5,000 tonnes.

Headquartered in Amsterdam in the Netherlands, Titan has been a supplier of LNG and liquefied biomethane (LBM), or BioLNG, since 2012. The firm specialises in providing shipping customers with end-to-end clean fuel solutions, including project planning, supply and delivery, as well as risk management and hedging services to mitigate price fluctuations.

"Titan expresses its gratitude to everyone involved, extending



Living Stone bunkering in Dundee

thanks to the skilled crews, Dundee port for their support, and DEME Group for entrusting Titan with this significant operation. This successful venture not only reinforces Titan's commitment to excellence but also establishes a strong foundation for future collaborations in the dynamic UK energy market," a spokesperson for the firm said.

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
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."

DNV warns of LNG supply crunch as global fleet grows

Classification society and registrar Det Norske Veritas (DNV) has reported a new milestone for the global LNG maritime fleet, with the number of LNG-fuelled ships in operation passing 500 in February and double-digit new deliveries in March.

The firm's latest market update however suggests that the rate of growth may lead to some issues for operators going forward supply and demand in the sector risks becoming unbalanced.

"A slow month for alternative fuel orders in March," Martin Christian Wold, Principal Consultant at DNV said. "New deliveries on the other hand continue at high pace, with 11 LNG-fuelled vessels and two methanol-fuelled vessels entering operations in the last month the supply crunch for LNG-bunkering is inching closer..."

Capacity crunch

Rapid growth in new vessels may be positive with respect to the wider energy transition but there is growing concern that on its current trajectory, the LNG bunker market will not have enough capacity to meet theoretical demand for LNG marine fuel.

The number of LNG-fuelled vessels worldwide has seen a significant increase of 181% since 2020, taking the total to 520 LNG vessels in operation. This marks a major rise from 471 in 2023 and 354 in 2022. According to DNV figures, there are currently 195 vessels on order for 2024, with this number set to increase to 348 in 2025 and 514 in 2028.



LNG tanker

Data from the industry coalition group SEA-LNG however indicates that there are only presently 73 LNG bunkering vessels globally, with 45 based in Europe and 19 in Asia. While Northern Europe is in a relatively favourable position, the industry may begin to experience the repercussions of supply shortages globally.

Alternative fuel demand

The International Maritime Organization (IMO) for instance has announced that the Mediterranean will become an emission control area (ECA) from May 1, 2025. This change will lower the allowable sulphur content of marine fuels in the region from the current limit of 0.5% to 0.1% and sources anticipate further tightness in the market as a result of this development.

"Following sky-high alternative fuels new orders in January and February, slightly slower activity was registered in March, with a total of five new vessels with alternative fuel propulsion added to our Alternative Fuels Insights database," Kristian Hammer, Senior Consultant at DNV, said. "Momentum for ammonia continues, with two additional orders bringing the total to five for the first three months of 2024, a clear signal that investment in ammonia is on the rise."

A recent report from S&P showed that that overall bunker demand for 2022 was around 320 million tonnes compared to an expected 328 million tonnes in 2030. The report also highlighted that, LNG accounted for 0.04% of bunker fuel consumption in 2021, a figure which is forecast to increase to

NEWS NUDGES

EU cautions over need for Russian LNG

European Union Agency for the Cooperation of Energy Regulators (ACER) has cautioned that imports of Russian LNG are still necessary, despite ongoing sanctions by member states.

"Reductions in Russian LNG imports should be approached with caution, particularly in light of the imminent expiration of the ship-or-pay transit contract for gas pipeline supply from Russia to Europe via Ukraine by the end of 2024," a spokesperson for ACER said.

This restraint is necessary because the supply of pipeline gas from Russia is expected to decrease by the end of the year, and despite the EU's successful substitution of Russian pipeline gas with LNG, following the Kremlin's full-scale invasion of Ukraine in 2022, the global gas market remains tight.



DNV reported landmark 500 LNG-fuelled vessels

Hapag-Lloyd milestone boosts LNG as transition fuel

Shipping line Hapag-Lloyd has completed the largest ship-to-ship bunkering of bioLNG to date, marking a significant milestone for LNG as a transition fuel.

The refuelling operation was carried out with the container vessel *Brussels Express* and was the first of its kind completed by the firm. Bunkering was carried out in collaboration with environmental commodities trading firm STX Group and fuel supplier Titan Clean Fuels.

"We'd like to thank all the partners involved for another smooth operation," Caspar Gooren, Director of Renewable Fuels at Titan Clean Fuels said. "We have been encouraged by the

demand for [bioLNG] so far, and this major bunkering represents a significant step in shipping's clean fuels transition."

The teams involved successfully transferred a total of 2,200 tonnes of LNG to the *Brussels Express* while it was docked at the port of Rotterdam. Fuel was supplied from Titan's bunker vessel the *Alice Cosulich*.

Fuel bridge milestone

As the world's fifth largest container line, the large scale use of bioLNG by Hapag-Lloyd was seen as a major milestone with Sead Keric, Managing Partner of Renewable Gas at STX Group congratulating Hapag-Lloyd on a "landmark deal in the shipping sector". Keric added that the transac-

tion was "proof of how liquefied biomethane can be a powerful tool on the path to a lower carbon transport sector".

The transaction follows a long-term collaboration between STX and Titan to liquify, store and deliver mass-balanced biomethane in Zeebrugge in Belgium and has been ISSC certified, providing recognition under the European Union's Renewable Energy Directive known as RED II.

Liquefied biomethane can either be delivered directly in the form of physical molecules or "Mass Balanced" whereby biomethane is injected into the gas network and transported to liquefaction plants and LNG terminals using the existing infrastructure through a system of mass balancing.

"Titan recognizes the LNG pathway via [bioLNG] and renewable e-methane as a practical, sustainable and cost-effective route to net-zero shipping emissions available today. We work every day

towards full regulatory compliance for shipowners and operators of deep sea ships," Gooren added.

Step-by-step approach

This approach greatly improves the ability for renewable LNG to act as a drop in or bridge fuel, allowing operators to meet emissions requirements without costly infrastructure replacement, retrofitting or investment in new fleets.

"This pioneering deal demonstrates that bunkering large quantities of liquefied Biomethane is possible and scalable," Jan Christensen, Senior Director Fuel Purchasing at Hapag-Lloyd, commented, "However, there is still more progress required regarding the necessary infrastructure and the regulatory framework. For us, bunkering liquefied Biomethane is another measure in our step-by-step approach to further decarbonize our operations to reach our goal of becoming net-zero by 2045."



Hapag-Lloyd completed the largest STS bioLNG bunkering to date

PTP progresses LNG bunkering roadmap

Malaysia's Port of Tanjung Pelepas (PTP) has progressed its roadmap for LNG as a transition fuel, partnering with shipping line CMA CGM to complete a world first bunkering operation.

The port authority oversaw refuelling of the vessel *Monaco* in February, marking the first LNG bunkering operation for a car carrier owned by CMA CGM.

"This milestone paves the way for further growth in LNG bunkering at PTP, contributing significantly to the decarbonisation of the maritime industry," Tan Sri Che Khalib Mohamad Noh, Chairman of PTP, said.

LNG expansion

Ranked as the world's 15th largest container port, PTP is a major nexus in the global transport system and a key driver for LNG uptake in Southeast Asia. The port has capacity to handle around 13 million teu annually with a heavy

focus on transshipment.

Following the successful refuelling of the *Monaco*, the port authority now plans to expand its LNG bunkering business. PTP's container terminal is a joint venture between APM Terminals and Malaysian infrastructure group MMC.

The bunkering operation was carried out in partnership with state-owned Petronas Trading Corporation Sendirian Berhad (PETCO). Headquartered in Kuala Lumpur, PETCO trades crude oil and petroleum products produced by affiliates and third parties, with wholly-owned subsidiaries PETCO Trading DMCC and PETCO Trading UK operating in Dubai and London and Limited.

"In preparation for the LNG bunkering operation, PTP worked closely since March 2022 with PETCO and CMA CGM, as well as with various other related government agencies to organise table-top exercises (TTX) and workshops, before carrying out the deployment exercise," Mark Hardiman, Chief Executive Officer of PTP, said.

Growth strategy

Hardiman was appointed as CEO of PTP in January this year, and brings 29 years of port sector experience across three continents and seven countries. He has laid



LNG bunkering at PTP

out a strategy to deliver long-term growth and value for all stakeholders, building on the port's position as a leading regional transshipment hub.

"I look forward to working with the board of directors and the team and am confident in our ability to achieve our growth plans and further cement our strong relations with our clients," Hardiman said.

AUSEA deploys drones to tackle methane slip

Tackling methane slip from LNG-fuelled vessels has long been a thorny problem for the maritime sector, but one approach that has gained traction in recent years has been the use of drone technology to monitor emissions.

Meeting this challenge has been the remit of a collaborative effort between TotalEnergies, CNRS, and the University of Reims Champagne-Ardenne, known as the AUSEA project.

“Methane emissions have many dispersed sources,” a spokeswoman for TotalEnergies said, “As a pioneer in detecting and quantifying emissions in real-life conditions, TotalEnergies is using the AUSEA technology to [achieve] our ambition of zero methane by 2030.”

Drone-mounted sensors

With a global warming potential 28 times higher than that of CO₂, methane is a highly potent greenhouse gas but one with a much shorter atmospheric lifetime. While LNG-fuelled engines have improved significantly over the last two decades, a small amount of methane can still escape during the propulsion cycle, a process known as methane slip.

To tackle this, the partners in AUSEA have developed a system that utilises drone-mounted ultra-light CO₂ and CH₄ sensors to monitor operations. This approach ensures access to hard-to-reach

emission points while delivering readings with the highest precision.

“In 2022, a campaign to detect and measure emissions on site in real-life conditions covered 95% of operated sites in the upstream sector. More than 1,200 AUSEA flights were carried out in 8 countries to cover 125 sites,” a project team member explains.

Seamless & autonomous

The drone technology features a diode laser spectrometer and is capable of detecting and quantifying methane emissions with a high

level of accuracy, at greater than one kilogramme per hour.

“The long-term objective is to use the technology as part of a seamless and autonomous system. To achieve this aim, the research teams are looking to develop an unmanned drone navigation system with data automatically streamed to the servers, as well as instantaneous data processing and reporting capabilities,” the team adds.

In addition to the detection campaign at static sites, the developers are in advanced discussions with operators to make the

AUSEA methane observation drone

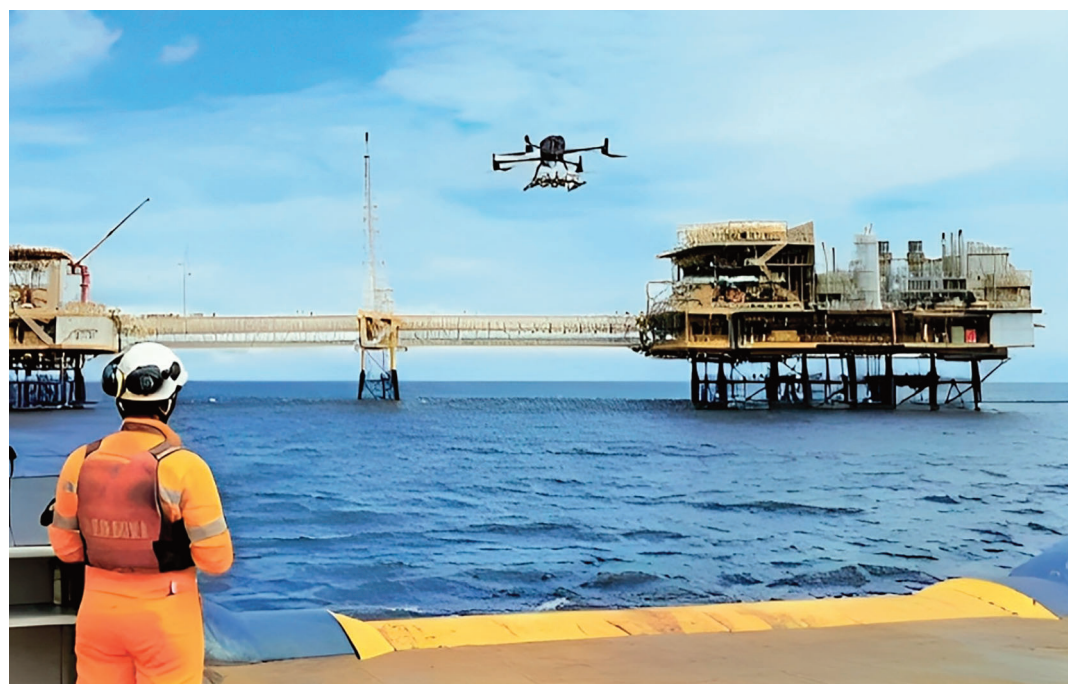
technology more widely available. For shipping lines and transport providers switching to LNG, the implications could be profound as drone technology is increasingly being used to monitor their emissions from a regulatory perspective.

Regulatory pressure

A recent report from the Washington DC-based International Council on Clean Transportation (ICCT), suggests that real-world methane emissions from LNG-fuelled ships surpass current regulatory estimates.

The ICCT study, drawing on data collected by drones, helicopters, and onboard sensors during the two-year Fugitive and Unburned Methane Emissions from Ships (FUMES) project, conducted in collaboration with Danish emissions monitoring firm Explicit and the Netherlands Organization for Applied Scientific Research (TNO), has prompted calls for policymakers to reassess the default methane slip value.

“If methane slip assumptions remain too low, shipowners will be able to use LNG in high-methane-slip engines longer, effectively getting an unfair advantage over lower-emitting fuels and engines,” said Dr Bryan Comer, lead author, and director of the marine program at ICCT.



AUSEA drone monitors offshore platform



Hydrogen



Climatetech

EXHIBITION & CONFERENCE

GEORGE R BROWN CONVENTION CENTER | HOUSTON | 17-20 SEPTEMBER 2024

Co-Hosts



ExxonMobil



Shipping & Marine Houston 2024

Investing in LNG infrastructure and
decarbonizing the marine value chain

The Gastech Shipping and Marine program
showcases the best peer-reviewed technical
papers on infrastructure, marine services,
logistics, and transportation.

**BOOK A
DELEGATE
PASS**



It aims to transform the global energy
shipping landscape by decarbonizing the marine
value chain.

50,000

Attendees

5,000

Delegates

1,000

Speakers

500

Ministers and
global energy
CEOs

125

Countries
represented

800

Exhibitors

20

International
country
pavillions

Host City:



Houston

Supported by:



Bilateral Chamber
bilateralchamber.org

Organized by:

dmg events

gastechevent.com

[@gastechevent](https://twitter.com/gastechevent)

[#Gastech](https://hashtagevent.com)

[in](https://www.linkedin.com/company/gastech) [ig](https://www.instagram.com/gastech) [f](https://www.facebook.com/gastech) [X](https://www.x.com/gastech)

EU-ETS scheme to reshape LNG portfolio optimization

New EU directives on shipping will result in a more fragmented LNG landscape within the maritime sector, according to new findings from market research firm Timera Energy.

Studying the impacts of the new European Union's Emissions Trading System (EU-ETS) carbon scheme on the LNG industry, the firm suggests that a plethora of solutions and responses are likely to emerge as regulation kicks in over the coming years.

"The impact of the scheme on vessels is not 'one size fits all' - it will vary across time and vessel types," a spokesperson from Timera said, "Additional costs incurred depend on EUA price, carbon emissions of propulsion fuel, fuel used, vessel capacity & speed, voyage distance and routing (laden & ballast legs)."

Since January 1, 2024, the scheme has encompassed shipping activities within the EU, with a schedule set to tighten regulation over the next few years. The scheme is to be phased in over

three years, increasing the charging burden for vessel owners as follows: 40% of emissions cost in 2024, 70% in 2025, and 100% by 2026.

This regulation covers all ships over 5,000 gross tonnage in size travelling within Europe and vessels operating within Europe now bear the cost of purchasing EUA carbon certificates, a development set to influence global price spreads and cargo flows.

LNG portfolio optimization

A case study conducted by Timera provides a detailed analysis of the potential cost implications for LNG shipping under the new EU-ETS carbon scheme, focusing on a 3.6 trillion British thermal units (tBtu) LNG cargo using the current EUA carbon curve and assuming a 0.15%/d



LNG tanker in harbour

boil off (all for propulsion) with no additional fuel oil requirement.

The research further explores the potential impacts on LNG market price spreads and cargo flows, as well as the broader implications for LNG portfolio optimization and value capture to show incremental shipping cost impact for a voyage from the US Gulf Coast to the GATE terminal in the Netherlands

at current EUA prices (~56 €/t) compared to 100 and 150 €/t.

The research suggests that these incremental cost numbers, while not seeming huge relative to the all-in price of LNG, can have a material impact on LNG market and will likely increase European LNG prices versus other destinations (e.g., Asia). Moreover, the volatility of carbon EUA prices over the last few years adds another layer of complexity to the LNG shipping landscape under the new EU-ETS carbon scheme.

"The most important impact of these marginal changes is on LNG portfolio optimisation and value capture," an analyst for Timera notes, "Even relatively small changes in shipping costs and cross basin spreads can have a substantial impact on cargo routing & margins."

Timera further predicts that as the LNG market continues to evolve and competition increases, value capture at the margin will become increasingly important for maintaining a competitive edge. ■



STS bunkering operation

NEWS NUDGES

Avenir orders bunker vessel duo from CIMC SOE

Fuel supplier Avenir has ordered two LNG bunkering vessels from Chinese shipyard, Nantong CIMC SinoPacific Offshore & Engineering.

The newbuild bunker supply vessels will each have capacity of

20,000 cubic metres and feature new Type C tank designs. The vessel design will enable lower boil off rates, hull form optimisation, and subcoolers to minimise emissions and cargo losses, as well as maximising compatibility and versatility for loading and discharging LNG and BioLNG.

"We are pleased to be return-

ing to SOE for our newbuilding programme and continuing our relationship with the shipyard where we successfully built our last four vessels," Jonathan Quinn, Managing Director, commented. "We look forward to welcoming these two new state-of-the-art vessels to our fleet in 2026 and 2027. With the demand

for LNG and BioLNG as a bunker fuel set to grow over the next decade, these vessels will play a vital role in ensuring security of supply and decarbonising global shipping markets."

The order is part of a major investment programme by Avenir to increase the fleet by up to 80% in terms of total capacity. ■

Seaside LNG adds *Tortuga* tug to fleet

Fuel solutions provider Seaside LNG has expanded its LNG-fuelled capacity in the US, having taken delivery of a new tug from Alabama shipyard Master Boat Builders.

The *Tortuga* is the firm's second tug from the shipyard and will connect with the barge *Clean Everglades*, which was delivered in late 2023, to form an articulated tug barge (ATB) unit.

"Seaside LNG/Polaris New Energy is leading the way in LNG maritime distribution, with the largest LNG bunker fleet in the country," Garrett Rice, president of Master Boat Builders, said. "We are proud to partner with an innovative company at the forefront of providing clean, dependable, competitively priced fuel for the shipping industry and look forward to working with them in the future."

Advanced technology

The new tug measures 33 metres in length and features two Caterpillar 3512E main engines, each producing 2,000 horsepower. The *Tortuga* also features two Berg model MTA 523 Z-drive thrusters and a JAK 400PHL-L coupling sys-

tem, supplied by Beacon Finland, which allows the tug to power the *Clean Everglades* and form the ATB unit.

"*Tortuga* will operate out of Jacksonville, Fla. alongside sister vessel *Polaris* – also constructed by Master Boat Builders, and delivered in 2022," a spokesperson for the firm said.

The *Clean Everglades* was built by Fincantieri Bay Shipbuilding of Sturgeon Bay, Wisconsin. The same ATB coupling system is used for a sister unit, comprising ocean tug *Polaris* and *Clean Canaveral*.

Strategic partnerships

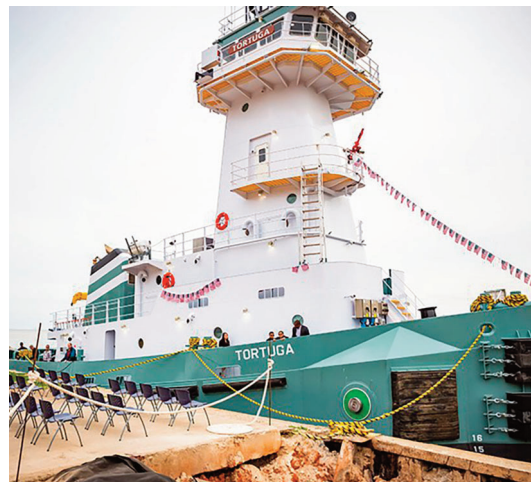
Of four LNG bunker vessels currently operating in the US, Seaside LNG controls three of them, *Clean Canaveral*, *Clean Everglades* and *Clean Jacksonville*, which it acquired from TOTE Maritime Puerto Rico, a subsidiary of TOTE Maritime Group, last year.

In November, the firm an-

nounced it would reposition *Clean Jacksonville* to the Port of Galveston in Texas, as part of a long-term LNG supply agreement with Carnival Corp.

Houston-based Stabilis Solutions will supply firm LNG deliveries from its liquefaction facility in Texas under the two-year contract with Carnival.

"Working with Tote, we have been able to provide more efficient deliveries of LNG on the U.S. East Coast while bringing the *Clean Jacksonville* to Galveston to expand our capabilities geographically," Tim Casey, CEO of Seaside LNG, said. "Our expectation is to continue to grow our fleet both on the East Coast and in the Gulf



The *Tortuga* LNG ATB

of Mexico."

Alongside its wholly owned subsidiary Polaris New Energy, Seaside owns a 50% stake of JAX LNG, a small-scale LNG production facility operating two trains in Jacksonville. Polaris New Energy maintains the largest fleet of Jones Act-compliant bunkering vessels in the US, including *Clean Canaveral*, *Clean Jacksonville* and tug *Polaris*, and *Clean Everglades* and tug *Tortuga*. ■

Seaspan expands Pacific Northwest LNG bunkering

Canadian shipping line Seaspan Energy has launched the second of three new LNG bunkering vessels, the *Seaspan Lions*, strengthening its position as fuel supplier on the West Coast of North America.

The *Seaspan Lions* was named after the twin peaks of the North Shore, known as Ch'ich'iyú Elxwíkn to the indigenous Squamish Nation. The firm launched the first of the three sister ships, the *Seaspan Garibaldi*, in January.

"Solving the LNG infrastructure gap on the West Coast will play a vital role in creating new markets for lower-emission fuels and a

more sustainable maritime industry," said Ian McIver, President of Seaspan Energy. "We understand the importance of providing low carbon bunkering solutions for ship owners who want to decarbonize their operations and we are committed to supporting the transition to cleaner, lower-emission marine fuels in British Columbia, Canada and the world.

Operational emissions reduction

The launch of the *Seaspan Garibaldi* made the firm the first company to provide LNG bunkering in the Pacific Northwest and the trio of vessels are scheduled to deliver fuel from Panama to Canada.

Each of the three vessels features capacity for 7,600 cubic metres of fuel and measure 112.8 metres in length, 18.6 metres in width, and five metres in draft. Construction has been undertaken by Nantong CIMC Sinopacific Offshore & Engineering shipyard in China, with the third vessel due for delivery in 2025.

"The bunkering ship design will integrate the latest ship technology, improve the capacity of the power storage system, and further

reduce operational pollution emissions and greenhouse gas emissions," a spokesperson for CIMC SOE said. "In addition, the ship is equipped with relevant thrusters which has excellent manoeuvrability and can be applied to LNG loading, unloading and bunkering services under different conditions. The performance indicators of the ship have reached the international advanced level."

All three vessels have been designed by Canadian naval architects Vard Marine based on requirements developed in partnership with the Port of Vancouver, Canada's largest port, and FortisBC, the owner of the Tilbury LNG facility in British Columbia. All three ships will be Canadian-flagged ship and classified by standards agency by Bureau Veritas. ■



The *Seaspan Lions*

Gail invests in LNG fuelling infrastructure

Indian state-run gas utility Gail has announced plans to invest in new LNG fuelling infrastructure across the country, as part of a wider strategy to switch road transport from diesel to gas.

The firm will invest an initial 6.5bn rupees (~ US\$78 million) to construct new LNG fuelling stations on key highways and close to mining and industrial zones, aiming to boost sustainable fuel solutions for road transport and reduce carbon emissions in the sector.

The company's goal is to secure over half of the market share in the retail LNG sector within the next five to six years and is part of a strategic plan to grow its natural gas portfolio. The firm aims to promote the shift from diesel to LNG, tapping into a vast market on the subcontinent.

"This will help Gail in the retail LNG sector, leading to an increase in natural gas portfolio," a spokesperson for the firm explained. "By converting transport fuel from

diesel to LNG, reduction in carbon footprint is envisaged."

Gail is one of India's largest natural gas firm, boasting comprehensive operations that span the entire value chain from exploration and production, to processing, transmission, distribution and LNG trading.

LNG 'critical' to policy development

According to a recent report from the National Institution for Transforming India (NITI Ayog), LNG is one of the most compelling alternative to diesel trucks. The report anticipates that LNG Heavy-Duty Vehicles (HDV) will constitute 10 percent of total HDV sales per annum by 2032.

"India's rapidly expanding



GAIL India building

trucking market, which is expected to more than quadruple, from 4 million trucks in 2022 to roughly 17 million trucks by 2050, offers immense scope for lowering emissions and encouraging investments for growth," Suman Bery, Vice Chairman of NITI Ayog, said. "The forward-looking 'Panchamrit' commitments and the updated Nationally Determined Contributions (NDCs) underscore the fact that India is a critical part of the global solution."

The report was developed in partnership with the Embassy of Netherlands as part of a bilateral cooperation agreement that aims to coordinate energy policy between the two countries.

"The Government of the Netherlands and NITI Aayog have joined forces and signed a Statement of Intent," Marisa Gerards, Ambassador for the Netherlands, commented, adding that the report was prepared jointly with the

support of Shell and provided an in depth "analysis of benefits, challenges and future prospects of LNG", recognising the fuel as "a first step in decarbonization of transport and logistics sector".

Gas network

GAIL signed a memorandum of understanding with Shell Energy India, a subsidiary of LNG Shell, in 2023 to collaborate in multiple areas, including the use of LNG for road transportation.

The firm will be able to draw on its huge network of natural gas pipelines in India. The firm currently owns and operates over 16,000 kilometers of gas pipelines and also holds a stake in India's largest LNG importer, Petronet LNG, which is actively working on establishing LNG filling stations.

GAIL purchases LNG volumes under long-term agreements with various countries, including Qatar and the United States. ■



GAIL operates over 16,000 kilometers of gas pipelines

NEWS NUDGES

Rystad recognises LNG as 'fuel of choice' for energy transition

Business intelligence group Rystad Energy has backed LNG as the 'fuel of choice for lower-carbon shipping', noting that LNG bunkering showing no signs of a slowdown.

In a recent research note, the firm states that numerous factors are driving the surge in

LNG bunkering demand, including stricter regulations, economic benefits and expanding infrastructure.

"Based on data for the end of March, LNG bunkering sales in 2024 are off to a strong start, with 1.9 million cubic meters already sold," Junlin Yu, Senior Analyst at Rystad Energy, said. "This is close to the total volume sold in 2022, suggesting the

potential for a significant increase by year-end. If so, total LNG bunker sales could surpass 7 million cubic meters by end-2024, highlighting the importance of LNG to maritime business and trade."

The firm adds that car carriers have emerged as a significant driver of LNG adoption, alongside container ships and LNG carriers, with more than

75% of new car carrier orders in 2023 for dual-fuel LNG engines.

Despite question marks remaining around just how environmentally friendly LNG is as a shipping fuel, Rystad sees price competitiveness, abundant supply and well-developed infrastructure continuing to give it an advantage over the alternatives. ■



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

Japan, US strengthen LNG export ties to support energy transition

Japan and the US have forged closer ties in the sphere of LNG development this quarter following high level meetings between Prime Minister Fumio Kishida and US President Joe Biden in Washington.

The two leaders met in in Washington to for a bilateral summit to discuss strategic cooperation and the wider energy transition. Both governments have emerged as leading players in the LNG industry, with the US rising to become the world's largest exporter and Japan ranked as one of the largest importers.

"The United States remains unwavering in its commitment to support the energy security of Japan and other allies, including its ability to predictably supply LNG while accelerating the global transition to zero-emissions energy," Biden said in a joint statement issued after their bilateral summit.

Export moratorium raises concerns

Despite the united front presented by the leaders there have been

concerns in Japan as a result of moves by the Biden administration in January to halt the approval of new export licenses for US LNG. The proposed legislation is still under review but aims to consider the impact of LNG exports on the Biden administrations climate commitments.

Japan is the world's largest provider of international public finance for LNG export capacity, having invested \$39.7 billion in projects since 2012. In the fortnight leading up to Kishida's meeting with Biden, Japan approved over \$2.7 billion in financing for new gas projects, including the contentious Block B gas project in Vietnam and the San Luis Potosi and Salamanca gas plants in Mexico.

Alongside these investments, Japan is also a key financier of US infrastructure, with Japanese

banks ranked as the top three private financiers of US LNG export infrastructure. Japan's export credit agencies have invested over \$8 billion into the Freeport and Cameron LNG export terminals along the Gulf Coast.

Clean energy technologies

The role of LNG in driving the energy transition was reiterated by both governments as they highlighted that investment will be part of a wider focus on decarbonisation and new, clean energy technology.

The leaders added that they would be "working with other fossil energy importers and producers to minimize methane emissions across the fossil energy value



Prime Minister Fumio Kishida and President Joe Biden

chain to the fullest extent practicable', with a goal to advance "widespread adoption of innovative new clean energy technologies, and seek to increase the globally available supply of sustainable aviation fuel or feedstock, including those that are ethanol-based, that show promise in reducing emissions."

Venture Global shakes up LNG sales model

Energy export firm Venture Global LNG has announced plans to expand its sales operations by purchasing a fleet of vessels to target markets directly.

The firm has acquired nine LNG carriers to transport cargoes, with plans to employ between 50 and 100 new staff to manage this new fleet.

"We're long LNG, and we mostly right now view this as just selling LNG rather than traditional traders, where they buy LNG from some producers and sell it to others," Mike Sabel, CEO of Venture global, said. "Over time, we'll look for opportunities where we will trade cargoes between basins,

and that'll develop naturally."

The move makes the firm the first American LNG producer to purchase its own fleet.

Contract dispute

The fleet of new LNG carriers are all South Korean-built and will allow Venture to cut out middlemen in some of its key trades as tensions grow over allocation of fuel. Some of the firm's largest existing customers, have complained that Venture has missed obligations

to contracted buyers while simultaneously selling at higher profit to local spot markets.

In January Shell and BP called on US energy regulators to start legal proceedings to disclose privileged documents revealing why Venture Global has delayed full commercial start-up of its Calcasieu Pass export plant in Louisiana.

Calcasieu Pass first started producing almost two years ago and has sold more than 250 shipments into local spot markets but it has yet to send a single cargo under long-term contracts.

Transition models

As a result, this latest shift towards direct sales and ownership of LNG carriers will be closely watched by industry. By taking control of its transportation logistics, the company aims to achieve

greater flexibility and agility but faces numerous challenges as well.

As LNG develops into a key transport fuel for the energy transition, pressure is mounting on traditional business models, with competition to enhance supply chain efficiency, reduce costs, and better meet the demands of a global clientele growing.

The first two of Venture's new vessels are scheduled for delivery later this year and will make a sizeable dent in capex spending. While the firm declined to comment on costs, similar vessels are currently trading at around US\$280 million each. Management will be hoping that the opening of its second plant, at Plaquemines, in Louisiana, will drive new revenues.

Venture Global is on track to become one of the biggest US LNG exporters this year.



Calcasieu Pass LNG export facility

Rotterdam plans Maasvlakte LNG bunkering expansion

Authorities at the port of Rotterdam have advanced plans to expand LNG bunkering capacity at the port, launching a tender for new ship loading services.

The proposed development will be at Gate terminal in the Maasvlakte area at the mouth of the Rhine. This massive man-made extension of the Europoort port and industrial facility within the Port of Rotterdam is already home to one of Europe's largest LNG import terminal and bunkering hubs.

"Gate terminal is exploring market demand through a non-binding call for expression of interest in small scale ship loading services for a new to be constructed jetty," a spokesperson for the port said, noting that this project will be known as 'jetty 4'.

Rapid growth

The tender process commenced in early March with all participants required to submit their interest by mid-April.

"Currently Gate terminal offers small scale ship loading, mainly for the marine bunkering market, at a dedicated small-scale jetty," the authority commented. "Considering the current high occupancy of the jetty and a positive outlook for the LNG bunker-market in Northwest Europe, an additional jetty is required to support growth for small scale loading."

The current jetty 3 is now nearing capacity as the number of LNG-fuelled vessels has risen sharply in the last year. Earlier this year, classification society DNV announced that the number of vessels in oper-



Maasvlakte

ation capable of LNG-bunkering is now over 500, a new milestone. Some 40 LNG-fuelled newbuild vessels have already been delivered in 2024, according to DNV.

Detailed engineering

Gate terminal was the first Dutch LNG import terminal and has been operational since 2011. Today the site has an annual throughput capacity of 12 billion cubic metres of gas per year, covering approximately a third of Dutch national gas consumption.

The terminal has three storage tanks, three jetties, three loading sites for lorries and an area in which LNG is converted into natural gas. Nederlandse Gasunie and

Royal Vopak are initiators and partners in Gate terminal.

"Based mainly on the outcome of this market consultation, Gate terminal will decide on moving towards detailed engineering and filing of the permit request," a spokesperson for the jetty 4 project said. "Participants are kindly requested to provide their best estimate of required jetty capacity

and term of contract."

The new jetty is seen as an important step in reducing GHG emissions from the marine sector, not only facilitating services for LNG but also Bio-LNG and synthetic LNG. It will also be designed to provide shore power to docked vessels, helping to reduce NOX and GHG emissions during their stay at the jetty. ■

NEWS NUDGES

US launches freight transport transition strategy

The Biden administration has unveiled the first National Zero-Emission Freight Corridor Strategy, highlighting key pathways to decarbonize the transportation sector.

The landmark strategy aims to ensure that at least 30% of medium- and heavy-duty vehicle sales are zero emission by 2030 and 100% of sales by 2040. Authorities aim to prioritize development of infrastructure along certain freight corridors and hubs in four phases.

"For over a century, petroleum-fuelled freight has transported vital food and re-

sources to American families but at the same time, these vehicles have also contributed to lower public health, especially in densely populated communities," Jennifer M. Granholm, US Secretary of Energy, said. "The Biden-Harris Administration is addressing this issue head-on with innovative strategies to transform freight so it not only supports American families and businesses, but also protects the environment for future generations."

In alignment with the Joint Office's National Zero-Emission Freight Corridor Strategy, the Federal Highway Administration is announcing the designation of National EV Freight Corridors along the National Highway Freight Network and other key roadways. ■

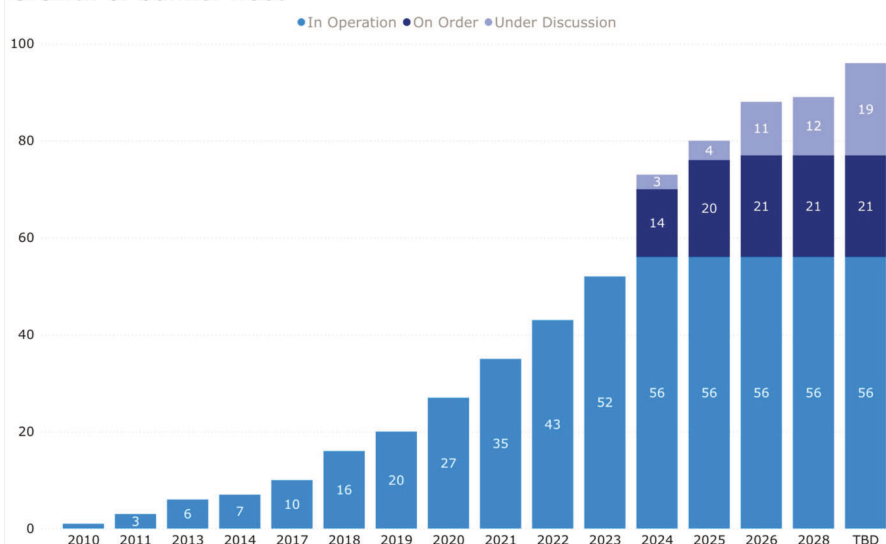


Gate terminal

PLANNED NEWBUILD LNG BUNKER VESSELS

Vessel Name	Delivery Year	Project status	Country	Home Port	Fuel
K LNG Dream	2024	Decided	South Korea		LNG
LNG Erasmus	2024	Decided	Europe	ARA	LNG
KEYS Azalea	2024	In operation	Japan	Kyushu & Setouchi regions	LNG
Paolina Cosulich	2024	In operation	Italy	Malacca Strait	LNG
Brisen	2024	Decided	Europe	Northern Europe	Methanol
TBN	2024	Under discussion	Netherlands	Rotterdam	Methanol
Floating Living Lab	2024	Decided	Singapore	Singapore	LNG
Consort Bunkers 1	2024	Decided	Singapore	Singapore	Methanol
Consort Bunkers 2	2024	Decided	Singapore	Singapore	Methanol
Consort Bunkers 3	2024	Decided	Singapore	Singapore	Methanol
Brassavola	2024	In operation	Singapore	Singapore	LNG
Maple	2024	In operation	Singapore	Singapore	Methanol
Titan Hyperion	2024	Under discussion	Netherlands	TBD	LNG
Hai Yang Shi You 302	2024	Decided	China	To be decided (China)	LNG
Crowley/Shell LNG bunker barge	2024	Decided	United States	U.S. East Coast	LNG
Seaspan LNG bunker vessel	2024	Decided	Canada	Vancouver	LNG
Seaspan LNG bunker vessel 2	2024	Decided	North America	Vancouver	LNG
Seaspan LNG bunker vessel 3	2024	Decided	North America	Vancouver	LNG
TBN	2024	Decided	China	Yangtze River	LNG
Ecobunker Tokyo Bay	2024	Decided	Japan	Yokohama	LNG
Titan Krios	2024	Under discussion	Belgium	Zeebrugge	LNG
Net Zero hive Canarias	2025	Decided	Spain	Canary Islands	LNG
Axpo LBV	2025	Decided	Italy	Coast of Naples	LNG
Woodside Western Australia LNG bunker vessel	2025	Under discussion	Australia	Dampier	LNG
Consort Bunkers 4	2025	Decided	Singapore	Singapore	Methanol
Consort Bunkers 5	2025	Decided	Singapore	Singapore	Methanol
Consort Bunkers 6	2025	Decided	Singapore	Singapore	Methanol
Fratelli Cosulich Methanol BV	2025	Decided	Singapore	Singapore	Methanol
Petronas LNGBV	2026	Under discussion	Malaysia		LNG
Scale Gas Algeciras	2026	Decided	Spain	Algeciras	LNG
Oceania Marine Energy	2026	Under discussion		Dampier	LNG
Oceania Marine Energy LBV	2026	Under discussion	Australia	Dampier	LNG
Osaka Bay LBV	2026	Under discussion	Japan	Osaka/Himeji	LNG
FSU and LNG Bunker Barge, Port of Coega, South Africa	2026	Under discussion	South Africa	Port of Coega	LNG
LNG bunker vessel Swinoujscie	2026	Under discussion	Poland	Swinoujscie	LNG
Domestic LNG Bunkering Vessel in China	2026	Under discussion	China	To be decided (China)	LNG
Kanfer Shipping LNG bunker vessel 1	2028	Under discussion	--	Not yet decided	LNG
TBN 1	TBD	Under discussion	Germany	Germany	LNG
TBN 2	TBD	Under discussion	Germany	Germany	LNG

Growth of bunker fleet



Bunker fleet by region

