LNG Transition

LNG AS A TRANSITION FUEL 4th Quarter 2024

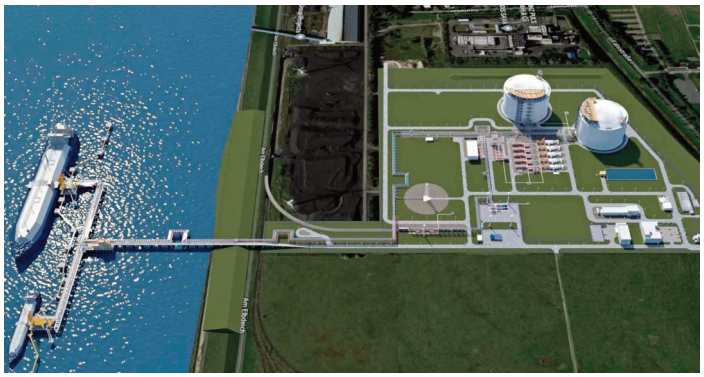
LNG facilities eye repurposing for green fuel transition

As the technology behind alternative low-carbon fuels matures, interest is growing in repurposing LNG terminals to strengthen their role as hubs in the energy transition.

By expanding the range of processes handled at these hubs, hubs, operators could potentially make signifcant cost reductions over the long-term, while also catering to emerging demand for new commodities.

In recent years, liquid hydrogen, methanol and ammonia have all emerged as leading contenders for low-carbon replacements but these all have very different physical properties and in most cases are many years away from technical maturity. Despite this, there remain numerous overlaps and energy and ship brokerage Poten & Partners points to a strong business case for greater integration of these future fuels at existing LNG facilities.

"A number of proposed terminals are considering how their facilities could be designed to be 'Hydrogen Ready'," notes a spokesperson from Poten & Partners. "This is seen as a potential option to mitigate the risks of LNG assets being stranded and to facilitate an easier switch to carbon-neutral fuels."



Brunsbuttel LNG terminal plans to integrate green hydrogen

Up to $400 million savings

According to Poten & Partners, the repurposing of LNG facilities could deliver substantial cost savings, up to $300-400 million for ammonia and $100 million for liquid hydrogen. However, these would typically involve significant capex investment upfront and detailed forward planning in terminal design.

"There will need to be extensive design checks or redesign of static equipment, replacement of rotating equipment and replacement of control and safety systems," Poten & Partners explains. "The effective capacity of the terminal will also be reduced."

For ammonia, restrictions on the fill limit, of around 62%, and lower heating value per cubic meter compared to LNG, at around 57%, reduce the effective storage capacity of an LNG tank to just 35%of its design capacity.

Despite these technical hurdles, ongoing advances in technology, coupled with the growing demand for carbon-neutral fuels, are expected to drive further innovation in terminal design and fuel handling processes.

"While there are no instances yet to date of existing LNG import terminals being converted to receive a carbon neutral fuel… terminal designers are considering options for receiving alternative fuels," spokesperson for Poten and Partners comments. "The viability of such conversions will be driven by the supply chain economics and regulatory view of the alternative fuels at the time owners seek to implement the conversion."

Vertical integration

For liquid hydrogen, the scope for reusing infrastructure is mostly limited to terminal land, the jetty structure, and ship berth dredging. The extreme low temperature required for liquid hydrogen storage creates additional challenges in terms of material compatibility and thermal insulation, however some sites, such as the Brunsbüttel terminal in Germany, located on the North Sea and Kiel Canal, are already integrating hydrogen.

"We are advocates of LNG [but] we want to make sure we are prepared for the next technological advancement," Javier Moret, Global Head of LNG at RWE, part of the joint venture developing Brunsbüttel. "In the future hydrogen will play a key role as a climate-neutral fuel in the energy mix."

In October this year, Norwegian chemical company Yara International officially opened its new ammonia import terminal in Brunsbüttel, adding capacity to import up to 3 million tonnes of low-CO2 ammonia annually.

The imported ammonia can be delivered directly for cracking into low-emission hydrogen via electrolysis using renewable electricity or using carbon capture and storage (CCS). ■

FUELLING NEWS AGENDA

Asda invests in BioLNG refuelling to accelerate decarbonization

UK supermarket chain ASDA has announced plans to invest in two new bio-LNG refuelling facilities as part of its energy transition goals.

Asda already operates the largest fleet of LNG-fuelled trucks in the UK, comprising almost 800 vehicles and is a strong supporter of the fuel as a lower-carbon alternative to diesel.

"LNG trucks are currently the leading alternative fuel option for operators like ourselves, and... our continued investment in a UK-wide LNG distribution network forms an essential part of our objective to reduce overall carbon emissions across our operations and towards building a sustainable business for the future,' John Rogerson, Central Fleet Operations Manager at Asda, states.

Gasrec partnership

Asda has worked closely with Gasrec, a major fuel provider for commercial vehicles in the UK, to establish the new stations in Warrington and Dartford. With this expansion, Asda now boasts thirteen fully operational Bio-LNG stations strategically located across the UK.

"We have forged a strong relationship with Asda, and it's a real pleasure to be able to deliver these two latest facilities for them as they continue to expand their growing gas fleet and invest in a cleaner and greener fuel source,' James Westcott, Chief Commercial Officer of Gasrec, emphasized.

Founded in 2003, Gasrec is headquartered in London and has built multiple refuelling stations across the UK, including the largest LNG refuelling station in Europe.

"As one of the UK's largest retailers, Asda understands the urgency in the need to cut emissions from its fleet as we all work towards a more sustainable transport sector. Bio-LNG remains a leading alternative to diesel for long-haul operations and will continue to be so for the foreseeable future," Westcott added.

ASDA bioLNG refeulling facility

Supply Chain Finance

This investment in bioLNG infrastructure follows Asda's recent initiative to launch a sustainability-linked enhancement to its Supply Chain Finance scheme, in partnership with HSBC UK. Set to launch in January 2025, this facility will use financial incentives to encourage better sustainability practices within Asda's supply chain.

The supermarket chain also revealed it had reduced operational carbon emissions in 2023 by 41%, against a target to achieve a 50% reduction by 2025. Publishing results in its annual ESG report earlier this year, the group highlighted the figures in comparison to baseline 2015 levels. ■

China LNG trucking surge displaces diesel

Low gas prices in China are fuelling a rapid switch from diesel to LNG for trucking and long-distance transport as the country seeks to reduce oil imports.

Significant increases in domestic gas production in recent years have been coupled with strong pipeline gas volumes from Russia, Turkmenistan and Myanmar. As a result, Chinese trucking companies are increasingly choosing LNG over diesel, driven by both economic and strategic factors.

This transition aligns with the Chinese government's broader strategic goals. And has been backed by heavy investment in LNG infrastructure.


Demand for LNG trucks has surged in China

Price differential

Data from Beijing-based research firm CV World shows that LNG trucks accounted for 42% of China's heavy-duty truck sales in the first eight months of 2024, a sharp rise from just 9% in 2022.

In northern regions, where LNG infrastructure is well-established, diesel trucks are now a rare sight and analysts at investment bank CICC estimate that LNG trucks could displace around 9.2 million tonnes of diesel demand this year, marking a significant reduction in China's overall diesel consumption.

This shift has been driven in large part by a steep price differential, with LNG about 23% cheaper than diesel in many locations. Currently, China pays around $8 per million British thermal units (MMBtu) for pipelined gas, significantly less than the cost of importing seaborne LNG.

Peak diesel

Looking ahead, the growth of LNG trucking, along with the rise of electric vehicles, is expected to dampen China's demand for diesel and possibly accelerate the country's overall peak oil timeline.

The International Energy Agency now projects that China's diesel demand will plateau as soon as next year, and some domestic analysts believe the peak may have already been reached, as diesel usage dropped by nearly 6% in July compared to the same month last year.

Challenges remain, however, as China's economy faces headwinds from its ongoing property crisis and structural weaknesses, which could hinder the pace of LNG adoption in trucking. The upfront capital investment required for LNG vehicles and infrastructure can be a significant barrier, especially for smaller operators, especially as global demand for LNG hits prices. ■

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EverLoNG completes second carbon capture campaign

The *SSCV Sleipnir* from Heerema Marine Contractors has successfully completed EverLoNG's second ship-based carbon capture (SBCC) demonstration, marking a significant milestone for the technology.

The crew of the *Sleipnir* received a certificate from HMR following completion of the landmark initiative on behalf of international research initiative EverLoNG. The milestone market the world's first carbon capture initiative on a semi-submersible crane vessel.

"Innovation is challenging, especially in offshore conditions," Meike Kolthof, Manager Sustainability at Heerema Marine Contractors, commented. "Last week I could share my appreciation towards the *Sleipnir* Crew by handing over this special certificate to Captain Willem van Herwaarden."

Over 80% Capture Rate

The campaign, which approached 500 operational hours, utilized a prototype CO2 capture unit developed in the Netherlands by Carbotreat and VDL Carbon Capture. Early results from the tests show that the unit performed above expectations, achieving a capture rate exceeding 80%, with approximately 1.5 tons of CO2 liquefied and stored onboard.

EverLoNG project coordinator, Marco Linders of TNO, noted that "successful conclusion of the Sleipnir campaign represents another important step towards decarbonising the global maritime fleet. The EverLoNG engineers and partners have overcome challenging circumstances to deliver these results and their efforts are to be applauded."

Full-chain capture

The European EverLoNG project is a three-year research initiative that brings together the maritime, R&D and engineering sectors and has been co-funded by the ERA-NET ACT3 programme.

The first EverLoNG campaign, conducted aboard the Seapeak Arwa, an LNG-powered carrier chartered by TotalEnergies, concluded in February 2024, achieving a CO2 capture rate of 85%.

Long-term the project aims to develop full-chain carbon capture, utilisation and storage (CCUS) networks – connecting SBCC with CO2 transport links, geological CO2 storage and markets for CO2 use.

Future work package will focus on assessing the impact of SBCC on various shipping infrastructures, exploring retrofitting options for different vessel types, life cycle analysis of captured CO_2, from storage to potential reuse, safety regulations and stakeholder engagement to boost SBCC acceptance across the maritime industry.

The EverLoNG consortium is a collaboration between 16 partners from five countries, comprising Germany, the Netherlands, Norway, the UK and the US. It is supported by an Advisory Board of representatives from port authorities, marine and shipping contractors, industry organisations and CCUS project developers. ■

Marco Linders

Herema SSCV Sleipnir

NEWS NUDGES

LNG bunkering market poised for growth

The global LNG bunkering market is forecast to grow at a CAGR of 45.2% from 2020 to 2027, according to findings by Allied Market Research.

The research firm predicts that the market will reach US$5.14 billion by 2027.

"IMO regulation on the sulphur content in the marine fuel and increase in offshore gas exploration & production activities are the key factors boosting the LNG bunkering market growth," a spokesperson for the firm said.

The firm expects the Asia-Pacific region will grow at the fastest rate, registering a CAGR of 45.9%, throughout the forecast period. Continued growth in LNG bunkering infrastructure development activities in Europe a is also expected to contribute toward strengthening of the LNG bunkering market there. ■

BW LNG joins Procureship platform

Solutions provider BW LNG has joined the Procureship digital e-procurement platform, aiming to optimize procurement capabilities for its LNG fleet.

The novel e-procurement platform relies extensively on automation and machine learning to guide purchasing capabilities.

"By adopting Procureship's technology, we are confident that our fleet will benefit from improved efficiency and streamlined operations, allowing us to meet the growing demand for LNG and cleaner energy options globally," Stefan Dahlström, Head of Procurement of BW LNG, commented. "This collaboration will enable us to make more data-driven decisions, reduce costs, and provide better value for our services."

Procurement capabilities

BW LNG is a subsidiary of Norwegian BW Group, and the addition of its 34-vessel fleet to the Procureship platform takes the total number of vessels to more than 2,000. BW joins over 85 fleet owners and operators, including Angelicoussis Group, Oldendorf Carriers, Starbulk Group, Technomar, Zeaborn Ship Management, and TB Marine Ship Management on the platform.

"Procureship is proud to be supporting BW LNG by ensuring their vessels have the procurement capabilities they need to keep their vessels moving, reducing their time spent in port and enabling their team to make smarter and quicker decisions that can support their day-to-day operations," Grigoris Lamprou, Co-Founder and Chief Executive Officer of Procureship, notes.

BW Group is a prominent global maritime company specializing in shipping, floating infrastructure, deepwater oil and gas production, and innovative sustainable technologies. Established in 1955 by Sir YK Pao, BW operates a fleet of over 450 vessels, including 200 LNG and LPG carriers, forming the world's largest gas fleet.

BW Helios LNG carrier

Machine learning edge

In addition to its shipping expertise, the group is heavily invested in renewables, with projects in solar, wind, energy storage, biofuels, and water treatment. Recently, BW LNG signed a multi-year agreement to convert one of its LNG carriers into a floating storage unit (FSU) for an LNG terminal in Jordan, enhancing energy security in the Middle East.

With its integration into Procureship, BW LNG aims to position itself to leverage digital advancements to enhance sustainability and operational efficiency across its fleet. This partnership is expected to significantly reduce lead times and enhance transparency, aligning with broader group commitments to innovation and environmentally responsible practices in the maritime sector. ■

Gazocean selects Ascenz Marorka digital platform

French ship management firm Gazocean has selected Ascenz Marorka's Smart Shipping platform as part of a strategy to simplify onboard operations.

Ascenz Marorka signed a deal to implement its Smart Shipping platform across Gazocean's fleet of six vessels, utilising automatic data collection from onboard sensors to produce performance and environmental reports.

"We are honored to support Gazocean in their digitalization efforts and pursuit of operational excellence," Anouar Kiassi, Managing Director of Ascenz Marorka, said "We have always placed great emphasis on the human factor in digital initiatives, which makes this collaboration particularly meaningful. It aims to improve crew working conditions by alleviating their administrative tasks, allowing them to concentrate on essential operations."

Headquartered in Marseille, Gazocean managed 11 vessels and completed 74 trips, in 2023, transporting a total of 11,320,772 units of gas.

Operational excellence

The new solution will be used to manage vessel performance and monitor LNG cargoes and aims to reduce the administrative burden on the crew, allowing them to focus on critical operational tasks.

"Digitalization and innovation are key levers in supporting our operational excellence and achieving both economic and environmental objectives," Régis Adnet, Chairman of Gazocean, commented "Through this initiative, we also aim to simplify the daily tasks of our crews and enhance our company's attractiveness in an increasingly competitive sector."

Alongside onboard monitoring, the platform will also assist shore-based teams through enhanced data quality and reduced time spent on manual checks and report formatting. The contract also covers Weather Routing services and access to Ascenz Marorka's Fleet Center.

Gazocean will install the Smart Shipping platform

Customised KPIs

French LNG fuel specialist GTT launched the Ascenz Marorka brand in 2023, formed from the collaboration of two of its subsidiaries: Ascenz, a Singaporean electronic fuel management company and Marorka, an Icelandic vessel performance management firm.

The brand brings together over 30 combined years of experience and its Smart Shipping platform incorporates real-time data capture to build actionable and relevant KPIs customised for each stakeholder based on type of operation. This data is then used to feed analytics and AI tools that not only monitor vessels but can also suggest follow up actions for improvement. ■

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ABS outlines future for nuclear-powered LNG carriers

A new report from classification society American Bureau of Shipping (ABS) has outlined the 'transformational impact ' of advanced nuclear technology to power LNG carriers.

The bold proposal considers the use of small modular nuclear reactor technology to power an LNG carrier and includes detailed risk assessments and design frameworks.

"While this technology is well understood on land, adapting it for marine application is in its infancy," Patrick Ryan, ABS Senior Vice President and Chief Technology Officer, said. "However, this study and the other research we have carried out clearly highlight its significant potential to address not only shipping's emissions challenge but to deliver a range of other operational advantages to the industry".

HTGR technology

Exploring the use of a high-temperature, gas-cooled reactor (HTGR) on the design, operation and emissions of a 145,000m3 LNG carrier design was modelled by ABS and co-author Herbert Engineering Corporation (HEC).

The study has already provided ABS and the industry valuable insights into heat and energy management, shielding, weight distribution, and other design elements for an LNG carrier utilizing nuclear propulsion. The next step will be to identify design challenges that can guide future rule development.

"ABS is committed to helping the industry evaluate its suitability for use in a range of use cases and LNG carriers is just one of a range of potential applications we are exploring," said Ryan.

LNG carrier

Zero refuelling

Early indicators form the research show that HTGR technology will likely enable faster transit speeds and facilitates zero-emission operations. While there would be no need for refuelling, the HTGR technology would require replacement approximately every six years.

The U.S. Department of Energy has awarded ABS a contract to investigate the obstacles to adopting advanced nuclear propulsion in commercial vessels and earlier this month, ABS launched the industry's first comprehensive rules for floating nuclear power plants at Idaho National Laboratory.

Research partners in the project will now collaborate to deepen the industry's understanding of the feasibility and safety considerations associated with nuclear propulsion. ■

Illustration of a small modular nuclear reactor

NEWS NUDGES

Titan predicts FuelEU boost for LNG bunkering

Dutch fuel specialist Titan predicts that introduction of the FuelEU Maritime legislation will strengthen the LNG bunkering market in Europe, with growth firming next year.

With LNG bunker sales at the port of Rotterdam having topped 200,000 cubic metres in every quarter so far this year Titan expects LNG demand to rise in 2025.

"'If you look into the percentage of volumes versus other fuels, it's there. It's not earth shattering just yet, however, if you combine that with the orderbook of LNG-powered or LNG-capable vessels, this is bound to become a very interesting picture going forward," Michael Schaap, Titan's Commercial Director said in comments to Bunkerspot.

Titan anticipates a significant uptick in demand for LNG, and especially bio-LNG, as the FuelEU Maritime regulation takes effect in January. Designed to reduce greenhouse gas (GHG) emissions from shipping, the regulation will introduce financial incentives that make low-emission fuels more attractive and driving pooling of LNG-compliant ships.

The bio-LNG supply chain is anticipated to expand rapidly, with European liquefaction capacity set to increase fourfold in the next three years, reaching 40 plants from the current ten. ■

GTT receives AiP for methane carrier design

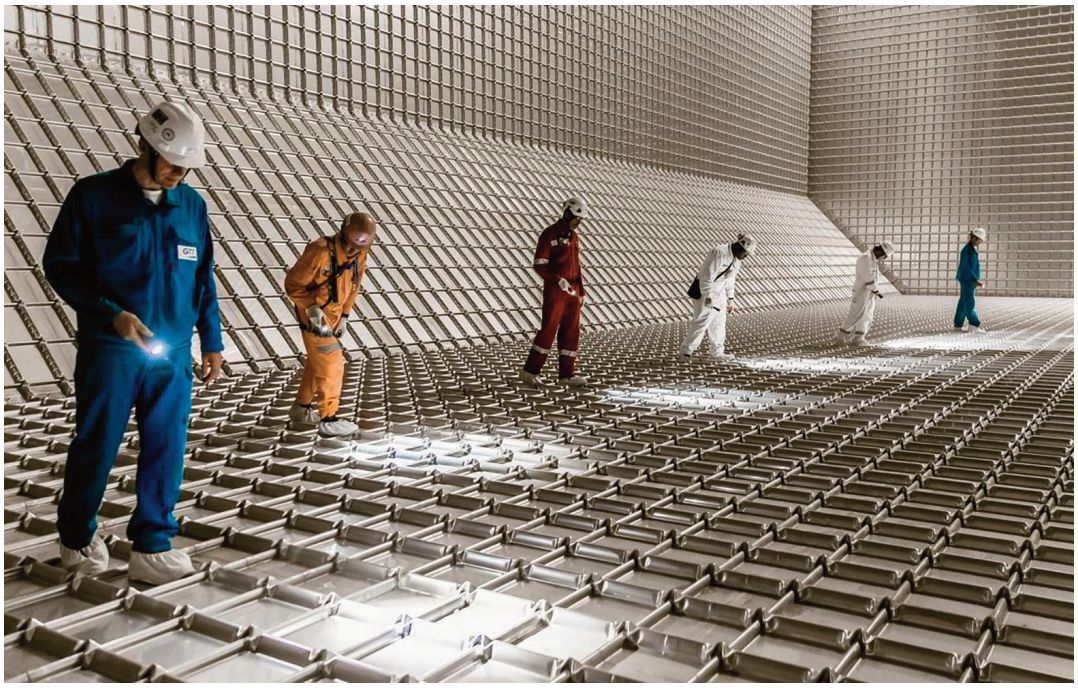
French LNG containment system specialist GTT has received an Approval in Principle (AiP) from ClassNK for an innovative methane carrier design.

The blueprint for the 30,000 cubic metre system features two identical tanks utilizing GTT's Mark III Flex membrane containment technology.

"Due to their intermediate size, the 30,000 m³ LNG carriers are particularly suitable for transporting LNG to regional markets or to terminals with reduced capacity," a spokesperson for GTT said. "They offer an ideal compromise between optimized cargo capacity and operational flexibility, while keeping operating costs under control."

This AiP confirms the feasibility and potential of the concept, highlighting the growing number of pathways for LNG operators to transition to alternative fuels like methane. Further efforts are now underway to prepare the design for potential future commercial production.

"Extensive studies, including a detailed analysis of liquid movements, have confirmed the advantages of this design. By reducing mechanical loads on the cargo containment system, this approach allows for unrestricted fill levels and removes the need for specific limitations often imposed by structural strength criteria.



GTT membrane containment system

Ballast Split

The new design developed by GTT incorporates an advanced tank configuration, featuring widened lower bevelled angles, and employs the "Ballast-Split" principle. This system separates the ballast tanks into a lower bottom and upper lateral tanks, enhancing the ship's stability in all operational conditions.

During ballasting, water is first pumped into the upper tanks, reducing the metacentric height while maintaining stability and decreasing rolling acceleration. This configuration effectively mitigates sloshing forces, especially during low filling levels, a critical aspect for feeder-type transportation.

Headquartered in Saint-Rémy-lès- Chevreuse in north-central France, GTT is one of the world's largest manufacturers of membrane containment systems for the storage and transportation of marine LNG fuel.

Strong performance

In October, GTT announced 12 orders for container ships and one bunkering vessel order during the third quarter of 2024 and 55% rise in revenue for the first nine months of 2024, compared to the same period last year.

"The growth in demand for LNG is generating additional needs for LNG carriers, supported by ongoing investments in liquefaction plants and the increase in shipyard construction capacity," Jean-Baptiste Choimet, Chief Executive Officer of GTT, said, noting that "commercial performance of our core business is particularly strong". ■

LNG carrier

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LNG export boom threatens oversupply by 2026

LNG markets could be poised for an unprecedented influx of supply, as a ramp up in export capacity turbocharges the sector, according to global asset manager RBC Capital.

The firm now forecasts that the market will enter an extended period of oversupply towards the end of 2026 as global liquefaction capacity booms.

"A wave of new LNG supply — the biggest yet— is set to reshape the global market in the coming years, with broader implications than prior growth given increasing inter-linkages between regional gas markets following the Russia-Ukraine conflict," RBC analysts predict.

Balancing market

Following years of tight supply and demand, several major export facilities are now nearing completion with significant nameplate capacity set to be added over the next 24 months.

As a result, a move towards oversupply may well change the dynamics of the sector with lower prices shifting decision-making processes across industries. In China, for instance the lower price of LNG this year has driven a surge in uptake for the fuel in the trucking sector, displacing diesel.

"China's role as a balancing market is expected to increase over the medium term, especially when considering the country's active role in securing LNG contracts. Nevertheless, China is unlikely to have the same balancing role as Europe had in the past due to its limited underground storage capacity, less flexibility in piped import contracts and low liquidity of domestic gas hubs," Gergely Molnar, Energy Analyst at the International Energy Agency (IEA), notes.

Liquefaction growth

An ability to transition to LNG in diverse industries is expected to absorb some of the excess supply as operators seek to minimise costs through a range of options from improved storage to LNG peak-shaving.

RBC predicts that global liquefaction capacity will increase by approximately 50% by the end of the decade, with the US and Qatar holding on to their status as the world's largest suppliers. Together these two exporters are expected to deliver nearly 50% of market share by 2030.

Anan Dhanani, Equity Research Analyst at RBC Capital Markets ~expects these two exporters will deliver nearly 50% of market share by 2030, noting that growth in output will "not only backstop European consumption but also capture an expected growth in consumption rates, particularly in Asia." ■

LNG export facility

AES to launch Panama LNG bunkering

US utility AES Corporation is set to launch LNG bunkering services for vessels on the Panama canal next year, having issued an Expression of Interest to the shipping community.

The proposed offering will be operated by Panama LNG Bunkering, a subsidiary of AES, in partnership with Canadian firm Seaspan Energy. The *Seaspan Garibaldi*, a 7,600 m³ bunker vessel will serve the waters of Panama, catering to LNG-powered vessels transiting the Panama Canal and Atlantic ports.

"We're eager to engage with shipping lines, vessel owners, and operators seeking bunkering slots for 2025," Ricardo Díaz, LNG Marketing and Origination Manager for AES, said.

AES expects to schedule spot contracts for the full calendar year with the launch of first LNG bunkering operations set for March 2025.

Panama LNG bunkering set for next year

Smooth integration

As one of the most vital arteries of global trade, the Panama Canal is a sought after location for LNG bunkering services. AES hopes to bolster its position as a key player in the maritime fuel market while promoting cleaner energy alternatives.

"By initiating these early discussions, AES seeks to facilitate a smooth integration of LNG bunkering into client operations, helping stakeholders meet environmental goals and adapt to evolving fuel requirements for vessels transiting the Panama Canal and docking at Panamanian ports," the firm notes.

Costa Norte

Last year, AES announced a partnership with Seaspan to develop LNG bunkering services focused around the Costa Norte LNG terminal in Colon, Panama. The terminal will offer temporary storage and reloading using Costa Norte's 180,000-cbm storage tank, allowing different market operators to store their LNG temporarily and withdraw it on demand.

"The collaboration with our shipowner partner and the innovations at our Costa Norte Terminal position us as leaders in driving sustainable, efficient and affordable solutions to meet the growing demands of the market," Miguel Bolinga, president of AES Panama, said. ■

PIL adds LNG power to South America route

Shipping firm Pacific International Lines has added two new LNG-fuelled container vessels to its fleet, following a naming ceremony at Jiangnan Shipyard in China.

The vessels each have capacity for 14,000-TEU containers and will be the largest vessels in PIL's fleet as well as the first to fully run on LNG.

"It is a happy occasion for us to name the first two of our 14,000 TEU LNG dual-fuel vessels. Taking delivery of these highly efficient vessels which run on LNG from their maiden voyage is a major milestone in our sustainability journey. They will contribute to reducing our carbon footprint as part of our strategy to transition to net zero emissions by 2050," Lars Kastrup, CEO of PIL, commented.

The vessels were named *Kota Eagle* and *Kota Emerald*, with the names chosen to convey PIL's aim to be a sustainable shipping line which 'co-exists harmoniously with nature and the environment'.

***Kota Eagle* completes first bunkering at Yangshan port**

Mark III LNG containment

Measuring 335 metres in length and with a width of 51 metres, both vessels are equipped with GTT's Mark III LNG containment system and feature a high container intake as well as various energy saving technologies such as superior hull coatings, an optimised hull form and variable frequency drive motors.

"The use of digitalisation on the vessels such as Artificial Intelligence (AI) and Internet of Things (IoT) will increase the automation of tasks as well as enable better monitoring and planning of the vessels' operations and routes through PIL's Centre for Maritime Efficiency. With a large number of specialised reefer electrical outlets onboard, the vessels have the flexibility to take on more refrigerated containers," a spokesperson for the firm commented.

Far East to Latin America

Originally ordered in 2022, they were the first dual-fuel LNG container vessels ordered by an Asian container line at the time. PIL currently has a further 11 new dual-fuel ships on order.

"This is a very special and exciting moment for us as it is the first batch of newbuildings after our restructuring and we are grateful to all of those who have supported PIL through the challenging times, allowing us to be here today," S.S. Teo, Executive Chairman of PIL, said.

Once delivered, *Kota Eagle* and *Kota Emerald* will be utilised for Far East to Latin America trade on PIL's West Coast Central and South America Service 2 route. As part of a brand refresh launched this year, the new vessels, will sport a red hull to signify 'the company's passionate approach in providing people-centric solutions'. ■

Kota Eagle* and *Kota Emerald


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Busan welcomes LNG milestone

The Korean maritime sector celebrated a milestone last month with the arrival of the first LNG-powered cruise ship at the Port of Busan.

The *Silver Nova* docked at the International Passenger Terminal, marking the next step in the port's transition to greener energy sources and underscoring South Korea's commitment to sustainable maritime practices.

"In line with the paradigm shift in ship fuel for the decarbonization of international shipping, the cruise ship industry is increasing the proportion of LNG-powered cruise ships that can reduce CO2 emissions by 20% to 30% compared to standard ship fuel," a spokesperson for the Ministry of Oceans and Fisheries (MOF) said.

The addition of LNG infrastructure is expected to strengthens the country's position as a hub for eco-conscious tourism, opening up new economic opportunities in sustainable travel, catering to the rising demand from travellers.

Evolution-class

Ordered in 2018 and completed in 2023, *Silver Nova* is the 12th ship in Silversea Cruises' fleet and debuted the firm's new Evolution-class, designed with a strong focus on eco-friendly cruising.

It is the world's first hybrid luxury cruise ship, powered by a mix of LNG, a fuel cell system, and batteries, which enable emissions-free operation while in port. Built by Meyer Werft in Germany, Silver Nova boasts a distinct asymmetrical design.

Measuring 244 metres in length and 30 metres in width, the vessel has a capacity of 728 passengers serviced by 556 crew members.

Long-term strategy

The arrival of the 54,000-ton eco-friendly fuel-powered cruise ship was announced by the MOF and Ministry of Culture, Sports and Tourism (MOCST) and hailed as a significant expansion of cruise port infrastructure and development of tourism.

"In response to these environmentally friendly trends, the MOF has been taking measures, such as supplying fuel to LNG ships via a ship-to-ship mode in August of this year and building eco-friendly infrastructure," an MOF spokesperson added.

South Korea has rapidly advanced its position as a key player in global LNG markets in recent years, driven by a commitment to energy diversification. As the world's second-largest LNG importer, the government's long-term energy strategy emphasizes the transition to LNG, which is seen as a crucial component in reducing greenhouse gas emissions and enhancing energy security. ■

The *Silver Nova*

Mitsubishi targets LNG capacity growth to fuel energy transition

Japanese multinational Mitsubishi expects its LNG capacity to reach more than 17 million tonnes by the start of next decade, as it doubles down on investment in the transition fuel.

The group's trading division has forecast growth in annual output of around 5 million tonnes per year, due largely to its investments in key production projects in Malaysia and Canada.

Currently, Mitsubishi has stake in 12 LNG projects, which have a collective output capacity of 110.4 million tonnes per year, with operations in Brunei, Malaysia, Australia, Oman, Russia, Indonesia, the US, and Canada

Mitsubishi's LNG production capacity is set to increase from 12 million tonnes per year now to 14 million tonnes per year by 2025. The upcoming LNG Canada project, expected to ship its first cargo by mid-2025, will then expand this further.

Petronas partnership

Mitsubishi's commitment to LNG was emphasized through its strengthened partnership with Malaysia's state-owned Petronas in September. A newly signed agreement will see Mitsubishi acquire a 10% equity stake in Malaysia LNG Tiga for the next decade, as well as extend its 10% stake in Malaysia LNG Dua starting in 2025.

"Mitsubishi Corporation looks forward to providing continuous support in growing and nurturing access to global LNG market for Petronas' future volumes with LNG being the fuel of choice in the age of energy transition," Katsuya Nakanishi said. "At the same time, we are excited to unlock further value through our collaboration with Petronas as well as with the Sarawak State Government, with whom we have achieved many historical milestones in Malaysia."

Positive impact

The Petronas LNG complex, in collaboration with Mitsubishi, has supplied LNG to Japanese buyers since 1983. Located in Sarawak, the complex has an annual production capacity of 29.3 million tonnes, making it one of the largest LNG production sites in the world. Mitsubishi's ongoing investments in Malaysia extend beyond LNG, covering sectors such as automotive, food, and steel, with the company's total investment in the country reaching approximately RM5 billion last year.

"Our relationship with Mitsubishi Corporation began with our first joint venture agreement in 1978 and we are therefore excited about strengthening our ties further, especially in the era of energy transition where LNG is the natural fuel alternative," Tengku Muhammad Taufik, President and CEO of Petronas, said. "I look forward to more exciting endeavours, as we leverage opportunities together and address challenges that will positively impact our organisations and nations."

LNG Complex in Bintulu, Sarawak

Japan remains the second-largest LNG importer globally, trailing only China. In 2023, the country imported 66 million tonnes of LNG for domestic consumption. However, as renewable energy and nuclear power usage increase, Japan has increasingly been trading surplus LNG volumes internationally.

Mitsubishi's recent sale of two Australian metallurgical coal mines has also accelerated its focus on LNG as well as contributing to a 33% rise in net profit for the six months ending in September, resulting in net profit forecast for the fiscal year remains at 950 billion yen. ■

TotalEnergies adds LNG bunkering capacity

French energy group TotalEnergies has expanded its LNG bunkering capacity, with the addition of a new vessel on charter from Spanish shipowner Ibaizabal.

The new vessel will be capable of supplying LNG to a wide range of vessels and the firm suggests it 'might be deployed in Oman, where the Company is developing the Marsa LNG project'.

Louise Tricoire, TotalEnergies Senior Vice President, Aviation and Marine Fuels, said, "We are very proud of this agreement with Ibaizabal, which reinforces our position as a main player in LNG bunkering".

The Gas Agility

Long-term relationship

Currently under construction by Hudong-Zhonghua Shipbuilding in China, the new vessel will be delivered by the end of 2026 and will expand TotalEnergies' fleet of deployed LNG bunker vessels to four in total.

Jorge Zickermann, CEO Ibaizabal Group, comments, "Ibaizabal is honoured to be chosen to carry out this Project as it falls within our strategy of decarbonizing the maritime industry, together with a leading company in the LNG field, while enhancing the already long-term relationship in shipping with TotalEnergies."

TotalEnergies current fleet includes the *Gas Agility*, positioned in the Port of Rotterdam, the *Gas Vitality*, operated from the Port of Marseille and the *Brassavola* located in the Port of Singapore.

Increasing demand

TotalEnergies is a strong supporter of LNG as a transition fuel for the maritime sector, noting that it ' is a sustainable, affordable and immediately available way of reducing emissions' in the shipping sector.

"With new LNG-fuelled vessels coming on stream at a rapid pace, we are committed to playing our part in responding to the sector's increasing demand for this fuel which can help global shipping meet its decarbonization ambitions," Tricoire adds.

Headquartered in Paris TotalEnergies is the world's third largest LNG player with a global portfolio of 44 Mt/y in 2023 and an integrated position across the LNG value chain. This includes production, transportation, trading, and LNG bunkering as well as access to more than 20 Mt/y of regasification capacity in Europe.

TotalEnergies anticipates growing international demand for LNG marine fuel with a rise of around 15% in the global fleet over the coming years.

"Worldwide, there are 1,000 LNG-powered ships in operation or on order, and the LNG fleet could reach 1,154 vessels by 2028," a spokesperson for TotalEnergies predicted. "LNG today represents the best alternative solution in terms of emissions, availability and price for reducing the shipping industry's environmental footprint." ■

Hudong–Zhonghua Shipyard in China

NEWS NUDGES

PIL places new LNG boxship orders

In October, PIL announced it had placed orders for a further five LNG-powered containerships, for delivery between 2027 and 2028.

The dual fuel 9,000 TEU containerships will be built by Hudong-Zhonghua Shipbuilding and are estimated to cost US$140 million.

A letter of intent (LOI), for the mid-sized ships outlines that the vessels will be eco-friendly designs, part of PIL's strategy to reach the decarbonization goal of net zero emissions by 2050. The agreement follows an order for five 13,000 TEU containerships placed by PIL with Hudong-Zhonghua in August. ■

WORLD SMALL SCALE LNG FLEET*

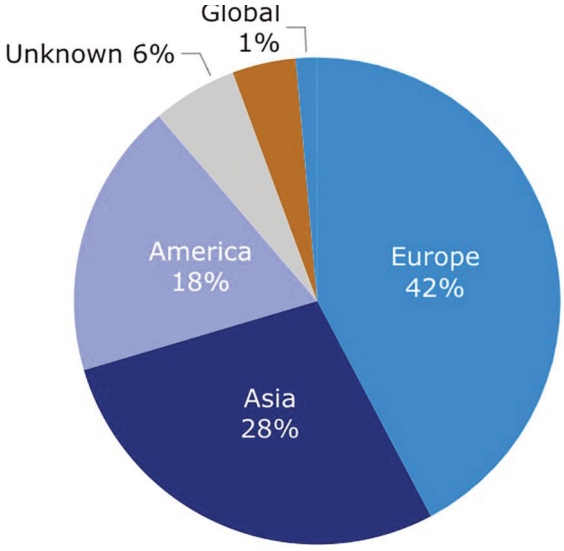
Built	Name	CBM	Cargo Type	Trading Area	Trading in LNG?	Ship Owner / Operator
1974	Seagas	187	LNG	Sweden	Yes	AGA
1988	Kayoh Maru	1,517	LNG	Japan	Yes	Daiichi
1993	Aman Bintulu	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1996	Surya Aki	19,475	LNG	Indonesia - Japan	Yes	MCGC
1997	Aman Sendai	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1998	Pelita Energy	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	Triputra	23,096	LNG	Indonesia - Japan	Yes	MCGC
2003	Pioneer Knutsen	1,100	LNG	Norway	Yes	Knutsen
2003	Shinju Maru No.1	2,540	LNG	Japan	Yes	Shinwa
2005	North Pioneer	2,500	LNG	Japan	Yes	Japan Liquid Gas
2007	Sun Arrows	19,531	LNG	Malaysia - Russia - Japan	Yes	Mitsui
2008	Kakurei Maru	2,536	LNG	Japan	Yes	Hogaki Zosen
2008	Shinju Maru No.2	2,540	LNG	Japan	Yes	Shinwa
2009	Coral Methane	7,551	LNG/LPG/Ethylene	Northwest Europe/Baltics	Yes, sometimes	Anthony Veder
2010	Coral Favia	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2010	Coral Fraseri	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Coral Furcata	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Coral Fungia	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
2011	Titan Vision	12,000	LNG/LPG/Ethylene	Europe	No	Titan LNG
2011	Titan Unikum	12,000	LNG/LPG/Ethylene	Europe	No	Titan LNG
2012	Coral Energy	15,600	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2013	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2015	JS Ineos Ingenuity	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Insight	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Intrepid	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	PetroChina TBN	30,000	LNG	China		PetroChina
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Innvovation	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Inspiration	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	LNG Prime	2,250	LNG	Northwest Europe	Yes	Veka Deen LNG
2017	Coralius	5,800	LNG	Northwest Europe/Baltics	Yes, for Skangas	Anthony Veder
2017	Coral EnergICE	18,000	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2017	Coral Encanto	30,000	LNG	China	Yes	Anthony Veder
2017	JS Ineos Invention	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	JS Ineos Intuition	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	Oizmendi	600	LNG	Spain	Yes	Itsas Gas
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	Green Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	New Frontier 1	6,500	LNG	Northwest Europe	Yes	Shell
2018	Kairos	7,500	LNG	Baltic	Yes	Bernhard Schulte
2018	LNG London	3,000	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 2	6,500	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 3	6,500	LNG	Northwest Europe	Yes	Shell
2018	Bunker Breeze	1,200	LNG	Barcelona	Yes	Suardiaz Energy Shipping
2018	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang
2019	Blue Whale	7,500	LNG	Korea	Yes	Korea Line
2019	Gas Agility	18,600	LNG	NWE	Yes	MOL
2019	Flexfueller 001	1,480	LNG	Amsterdam	Yes	Titan LNG

Data last updated = 6 November 2024 | For more information please visit http://small-lng.com.

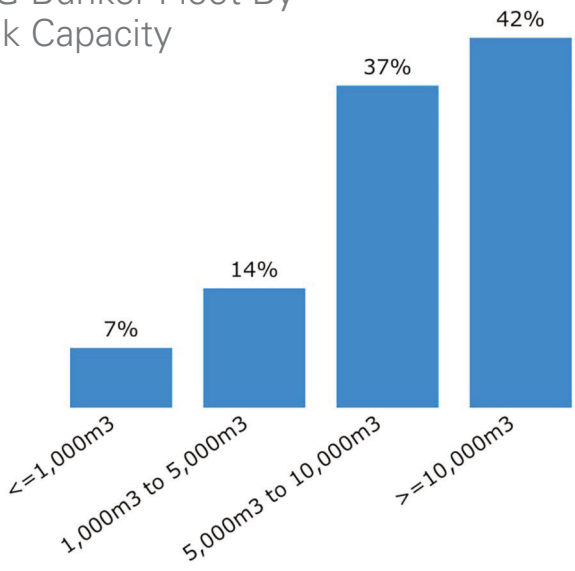
Built	Name	CBM	Cargo Type	Trading Area	Trading in LNG?	Ship Owner / Operator
2020	Avenir Advantage	7,500	LNG	Mediterranean	Yes	Avenir LNG
2020	Avenir Accolade	7,500	LNG	Mediterranean	Yes	Avenir LNG
2020	Avenir Aspiration	7,500	LNG		Yes	Avenir LNG
2020	Kaguya	3,500	LNG	Japan	Yes	CLS
2020	CNTIC VPOWER Global	28,000	LNG	Myanmar	Yes	Dalian Inteh Group
2020	Ecobunker Tokyo Bay	2,500	LMG	Japan	Yes	Ecobunkers
2020	Optimus	6,000	LNG	NWE	Yes	Elenger
2020	FueLNG Bellina	7,500	LNG	Singapore	Yes	FuelLNG
2020	SM Jeju LNG2	7,500	LNG	Korea	Yes	Korea Line
2020	Q-LNG 4000	4,000	LNG	US Coast	Yes	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	Levante LNG	12,500	LNG	Spain	Yes	Knutsen OAS
2023	SM Jeju LNG3	7,500	LNG	Korea	Yes	Korea Line
2023	New Frontier 2	18,000	LNG	USG	Yes	Shell
2023	Krios	4,200	LNG	Benelux	Yes	Titan LNG
2023	Alice Cosulich	8,000	LNG	Mediterranean	Yes	Fratelli Cosulich
2023	Kanfer TBN	6,000	LNG	Worldwide	Yes	Kanfer Shipping
2023	Kanfer TBN	6,000	LNG	Worldwide	Yes	Kanfer Shipping
2023	Clean Everglades	5,500	LNG	USG	Yes	PNE
2023	FueLNG Venosa	18,000	LNG	Singapore	Yes	FuelLNG
2023	LNG Erasmus	8,000	LNG	NWE	Yes	Shell
2023	Energy Stockholm	8,000	LNG	NWE	Yes	Shell
2024	Coral Evolution	30,000	LNG	Australia	Yes	Anthony Veder ?
2024	Progress	12,000	LNG	US Coast	Yes	Crowley Maritime
2024	CNOOC TBN	12,000	LNG	China	Yes	CNOOC
2024	TBN	12,500	LNG	Worldwide	Yes	???
2024	Keys TBN	3,500	LNG	Japan	Yes	Keys Bunkering West Japan Co
2024	Seaspan Garbaldi	7,600	LNG	Panama	Yes	Seaspan ULC
2024	Paolina Cosulich	8,000	LNG	Mediterranean	Yes	Fratelli Cosulich
2024	Huaihe Nengyuan Qihang	14,000	LNG	China	Yes	Anhui Changjiang LNG
2024	Keys Azalea	3,500	LNG	Japan	Yes	Keys Bunkering West Japan
2024	Seaspan Lions	7,600	LNG	Canada	Yes	Seaspan ULC
2024	Hai Yang Shi You 302	12,000	LNG	China	Yes	CETS (CNOOC)
2025	Axpo TBN	7,500	LNG	Italy	Yes	Axpo
2025	Seaspan TBN 3	7,600	LNG	Canada	Yes	Seaspan ULC
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	ScaleGas TBN	12,500	LNG	Spain	Yes	ScaleGas
2026	Vitol TBN 1	12,500	LNG	Worldwide	Yes	Vitol
2026	Total TBN	18,600	LNG	Worldwide	Yes	Total Energies
2027	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2027	Vitol TBN 2	20,000	LNG	Worldwide	Yes	Vitol
2027	Peninsula TBN	18,000	LNG	Europe	Yes	Peninsula

Growth of LNG-fuelled fleet

LNG Bunker Fleet By Region



LNG Bunker Fleet By Tank Capacity



Location of worldwide LNG bunker fleet by region