LNG Transition

LNG AS A TRANSITION FUEL 3rd Quarter 2024

Maersk makes strategic pivot to LNG, boosting transition plans

Danish shipping giant Maersk has revealed a surprise pivot in its support for LNG, shifting away from methanol as it faces cost challenges with scaling the fuel and a clearer pathway for LNG to achieve its decarbonization targets.

Maersk has been a stern critic of LNG in recent years, throwing its support vigorously behind methanol instead. However, slower-than-expected ramp up of green methanol facilities and a dearth of availability of the fuel at key ports has led the major shipping line to ditch its support and embrace LNG.

While details of any deal remain confidential, reports suggest that Maersk is deep in talks with providers to build a fleet of large LNG-fuelled boxships. The firm is reported to have enquiries out with multiple shipyards, with plans to construct a fleet of at least 23 LNG dual-fuelled vessels.

"Two years ago, potential green methanol suppliers were telling us about 2024 deliveries, but now no one can deliver," Xie Wenxuan, China decarbonisation business development manager at Maersk, said.

Transition pathway

The move is seen as a short-term hedge, as Maersk does not want to diverge too far from its competitors and has seen the LNG fuel market as an effective pathway to decarbonisation. This comes as the entire industry seeks to navigate the upcoming period of regulatory uncertainty with new legislation brewing from the International Maritime Organization (IMO) and the European Commission.

Artist's rendition of Maersk containership

Compared with grey methanol, LNG offers more CO2 reduction for shipowners and has far greater energy density as a more efficient fuel, even though methane slip remains a big unsolved issue. Greener bio-methanol and carbon-neutral e-methanol made with renewables, on the other hand, are expensive and scarce. Factoring in energy density, bio-methanol is now three times the cost of low-sulfur fuel oil prices. The industry had hoped that expanding production would lower costs, but progress has been uneven.

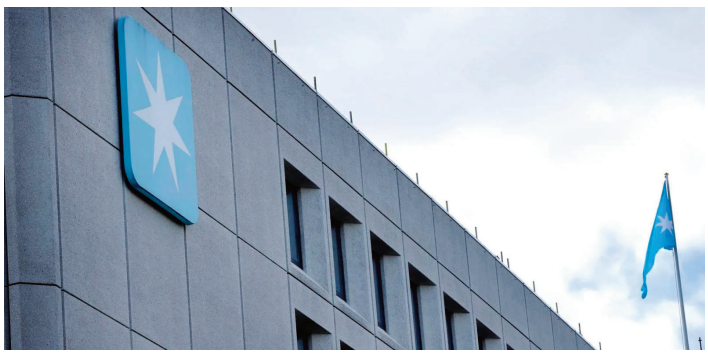
Maersk's green methanol projects in China, for example, face challenges such as overpromising suppliers and production technology difficulties. While China's advanced renewables industry gives it some advantages in producing alternative fuels, other barriers such as technical issues and costs have slowed progress.

Sustainable supply chain

Despite these challenges however, Maersk continues to see methanol as a viable option in the longer term and recently announced its newest methanol-enabled vessel in the US. The ship will be christened at a naming event this summer in Los Angeles in collaboration with sportswear firm Nike.

"Operating one of the largest supply chains in the world, we have a responsibility to advance the innovation and use of more sustainable methods that get us closer to zero carbon and zero waste," a spokesperson for Nike said. "By working with suppliers like Maersk, who share our commitment to sustainability, we are scaling our use of biofuels in ocean transportation, our main first-mile delivery channel."

Capable of carrying more than 16,000 containers, the vessel will be launched at the Port of Los Angeles Outer Harbor in August, making it one of the world's first methanol-enabled vessels. ■



Maersk headquarter building

FUELLING NEWS AGENDA

EIG ramps up LNG acquisitions for low-carbon future

Investment firm EIG has made a series of strategic acquisitions to expand its LNG portfolio as part of a move to decarbonise energy supply chains.

Through its management unit MidOcean Energy, the firm acquired LNG assets in Australia from Tokyo Gas, as well as a 20 percent interest in Peru LNG (PLNG), owner and operator of the first LNG export facility in South America.

"The acquisition of these high quality, cash flowing LNG projects is a significant milestone in MidOcean's strategy to build a diversified, global 'pure play' integrated LNG company that supports the world's transition to a low-carbon future," De la Rey Venter, MidOcean Energy's CEO, said.

LNG vessel docking

New centre of gravity

The deals with Tokyo Gas include interests in the Gorgon LNG, Pluto LNG and Queensland Curtis LNG projects and spans the LNG value chain from upstream operations to midstream, liquefaction and sales. MidOcean will open an office in Perth, Australia, to develop partnerships with existing asset operators, including Chevron, Woodside and Shell.

"We are strong believers in the role of LNG as a key enabler of the energy transition and formed MidOcean to provide partners and investors differentiated exposure to the asset class," R. Blair Thomas, CEO of EIG, notes. "With these foundational assets, MidOcean has entered key projects and markets in Asia, which form the centre of gravity of the global LNG business."

Barrenjoey, Barclays and JP Morgan acted as financial advisors to EIG and MidOcean in connection with the transaction, with White & Case acting as legal advisor.

The firm's entry into the South American market was also hailed as a milestone with the team highlighting an 'ambitious growth strategy' to capture value across the full LNG value chain.

"As the only LNG export facility in South America, PLNG is uniquely positioned in the global marketplace... We look forward to a strong partnership with the PLNG co-venturers and our work towards sustaining PLNG's positive impact for many years to come," Venter added.

Critical enabler

Earlier this year, the firm also announced a strategic investment from Mitsubishi to develop LNG infrastructure and its role as a critical enabler of the energy transition. The partners now aim to create a competitive long-term growth platform in LNG for its investors.

"We are thrilled to have Mitsubishi Corp join as an anchor investor in MidOcean Energy," Venter said. "Mitsubishi Corp has been a pioneer of the global LNG industry and has consistently demonstrated its expertise and foresight in identifying valuable opportunities."

Headquartered in Washington DC, EIG specializes in private investments in energy and energy-related infrastructure on a global basis and has around US$22.9 billion in assets under management. The group's clients include many of the leading pension plans, insurance companies, endowments, foundations and sovereign wealth funds in the US, Asia and Europe. ■

TTP files appeal against EPA Phase 3 ruling

Industry coalition The Transport Project (TTP) has filed a legal appeal against the US Environmental Protection Agency's ruling on gas use for Heavy-Duty Vehicles.

The lawsuit accompanies a Petition for Reconsideration that aims to get the government to reassess its latest Phase 3 ruling on natural gas in the transport supply chain.

"This Final Rule unfairly and capriciously manipulates outcomes to advance favoured technologies,' a spokesperson for the TTP said. "Instead of accelerating the pace of all clean vehicle technology development and reducing greenhouse gas emissions and other harmful pollutants, this regulatory action would slow that progress by discouraging fleets from continuing the phase-in of more natural gas-fuelled trucks."

The TTP contests key data used in the EPA Phase 3 ruling, which suggests that the annual average carbon intensity score of bioCNG was -126.42 gCO2e/MJ last year.

"The EPA Phase 3 Final Rule as written refuses to acknowledge or even attempt to refute those outcomes and validate RNG's carbon-negative impact as an affordable, scalable, and available-now transportation fuel," the coalition states.

LNG pathway

TTP is a national coalition of roughly 200 fleets across the US and has been a long-term supporter of natural gas as an effective pathway to net zero. It represents vehicle and engine manufacturers and dealers, servicers and suppliers, and fuel producers as well as specialised providers focused on decarbonization of North America's transportation sector.

In June, the coalition in partnership with the California Renewable Transportation Alliance announced new findings that showed renewable natural gas (RNG) is already achieving carbon-negativity in Californian road transport fleets.

"California's commercial fleets deploying trucks fuelled by RNG are achieving a cost effective, carbon-negative transportation outcome today without compromising existing business operations," Daniel Gage, President of TTP said. "When used as a transportation fuel, RNG displaces gasoline and diesel in applications that are difficult – if not virtually impossible – to electrify."

Liquefied Compressed Natural Gas (LCNG) fueling site in California

The coalition estimates that renewable natural gas (RNG) accounted for 97% of all on-road fuel used in natural gas vehicles in California in 2023 and sees potential for LNG infrastructure to add further capacity as new facilities come online. ■

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China progresses plans for Yangtze LNG gasification

Authorities in China have advanced plans for the "Gasification of the Yangtze river", taking delivery of the LNG bunker vessel *Huaihe Neng Yuan Qihang*.

The 14,000-cubic-metre vessel was delivered by Chinese shipbuilder Hudong-Zhonghua two months ahead of schedule. It follows the launch of the vessel in January and completion of gas trials in June.

The *Huaihe Neng Yuan Qihang* is the world's first river-to-sea direct LNG bunkering vessel and was developed, designed and built by Hudong-Zhonghua.

Year-round navigability

The pioneering vessel features a dual-fuel powered full-revolving propulsion system, which enables flexible manoeuvring in narrow inland waterway. This is combined with a shallow draught allowing for unlimited ocean navigation, but also providing flexibility for navigability under extreme low water levels in the Yangtze River channel.

"It can pass through the Nanjing Yangtze River Bridge all year round, achieving the dual functions of direct river-sea one-stop LNG refuelling and transportation," a state media spokesperson commented.

The *Huaihe Neng Yuan Qihang* measures 130 metres in length, 23.6 metres in width and 15 metres draught.

The ship features a Type B tank LNG containment system, marking the first application of the system in a domestic LNG transport ship and a breakthrough in Chinese LNG containment system development.

National strategy

The *Huaihe Neng Yuan Qihang* is seen as a key element in the government's "Gasification of the Yangtze river" and "2030 green intelligent standardized ships" programmes. Authorities aims to accelerate green investment along this major trade roue, promoting ecological protection and high-quality development of Yangtze River shipping.

Last year, shipping group CIMC Enric signed a contract with CSC Bulk Shipping for the construction of four 12,500-ton clean energy river-sea through dry bulk carriers as part of the same national strategy.

The Yangtze River is the largest shipping artery of China's inland waterways, with an annual transport volume of up to 3 billion tons, accounting for more than 60% of the total inland waterways.

"CIMC Enric will continue to contribute to the research, development, and application of intelligent technologies such as LNG tank-swap and bunkering, the construction of supporting facilities for green and intelligent vessel operations, and the standardized design and manufacturing of green and intelligent vessels," Gao Wenbao, Vice President of CIMC Enric, commented. ■

Huaihe Neng Yuan Qihang

Yangtze river

NEWS NUDGES

Shell opens first German bioLNG plant

Energy firm Shell has commissioned its first German bioLNG plant at the Cologne-Godorf refinery site.

The new facility features nameplate capacity of 100,000 tonnes per year, and is the largest of its kind in Germany. biomethane for the liquefaction plant will come from the gas grid, with an estimated 1.5 billion kWh of biomethane required.

Shell has partnered with Danish company Nature Energy for procurement, with German fuel used initially followed by imports from Denmark dependent on regulatory approval. German biomethane volumes are currently sufficient to supply around 70% of green production.

"We will endeavour to supply the plant with as much biomethane as possible," Felix Faber, managing director of Shell Germany, said. ■

Nordsol, Prodeval launch pioneering bioLNG plant in Portugal

Dutch technology group Nordsol and biogas solutions provider Prodeval have announced plans to collaborate on construction of a bio-LNG production plant in the south of Portugal.

The proposed facility will utilise organic waste from the olive oil production sector to create clean, renewable energy. Located close to an existing industrial zone, the plant was hailed as a 'significant milestone' in sustainable energy development for the region and the industry at large.

"We are pleased to partner with Prodeval, marking the introduction of our cutting-edge biogas liquefaction technology in Portugal. This collaboration showcases our high-quality standards, technical expertise, and unparalleled energy efficiency within the industry," Léon van Bossum, CEO of Nordsol, said.

Nordsol bioLNG tank

Olive oil waste

The southern region of Portugal is a major producer of olive oil and the potential to capitalise on waste output offers significant upside for the industry. the partners' new bioLNG plant is forecast to produce 10 tonnes of bio-LNG and 21 tonnes of biogenic liquefied CO2 daily from 1100 nm^3/h of biogas, primarily sourced from olive wastewater.

"This is fantastic news," Sébastien Paolozzi, CEO of Prodeval, said. "I'm particularly excited because this project aligns perfectly with our values of promoting the use of biomethane in all its forms. LNG is and will continue to be a significant method for harnessing the potential of biomethane, especially for mobility purpose."

Liquefied biogas from the plant will be used as a local transport fuel as well as providing the potential for connection into the natural gas network. From this entry point, biomethane will be utilized to decarbonize high-temperature / high-pressure industrial processes.

"The bio-LNG production process involves upgrading biogas into biomethane using Prodeval's advanced VALOPUR membrane technology. This biomethane is then liquefied to bio-LNG using Nordsol's innovative, energy-efficient technology, providing a high energy density, sustainable alternative to fossil fuels," a spokesperson for the partners said.

Biogenic CO2 capture

The biogenic CO2 captured in the process will be liquefied using Prodeval's V'COOL FG system, with liquefied CO2 utilized in the food and beverage industry, effectively replacing CO2 derived from fossil fuels.

To maximize efficiency and sustainability, the plant will integrate Prodeval's biogas upgrading and CO2 liquefaction technologies with Nordsol's innovative biomethane purification and liquefaction process, which has been operational in Amsterdam for nearly three years. This project represents Prodeval's third installation for a client in Portugal.

"This project marks a significant stride in renewable energy innovation within the region, reinforcing Nordsol's unwavering commitment to expanding bio-LNG production capacity across Europe with our established technology." van Bossum of Nordsol notes. ■

Honeywell acquires Air Products' LNG business for $1.81bn to accelerate energy transition

Multinational conglomerate Honeywell has acquired the LNG process technology and equipment business of industrial gases supplier Air Products for a record US$1.81 billion, as part of its strategy to accelerate the energy transition.

Under the terms of the agreement, Honeywell will acquire Air Products' LNG pre-treatment solutions and advanced coil-wound heat exchangers (CWHE) as well as related equipment.

"While the world continues to build the renewables-based energy infrastructure of the future, natural gas is a critical lower-emission and affordable transition fuel that will help meet ever-increasing and dynamic global energy demands," Vimal Kapur, Chairman and CEO of Honeywell, states.

CWHEs are known for their high throughput of natural gas, compact footprint, and reliable operations, making them ideal for both onshore and offshore applications. The all-cash transaction is expected to close by the end of the year.

Compound growth

"This highly complementary acquisition will further strengthen our energy transition portfolio, and Air Products' CWHE technology will immediately expand our installed base - creating new opportunities to compound growth in aftermarket services and digitalization through our Honeywell Forge platform," Kapur adds.

This acquisition marks Honeywell's fourth in 2024 and is a key component of its strategy to drive future growth across its portfolio, focused on three megatrends: automation, the future of aviation, and energy transition.

Ken West, President and CEO of Honeywell's Energy and Sustainability Solutions (ESS) segment, noted: "The integration of this talented team and the acquired proprietary technologies will enable Honeywell UOP to bring a full spectrum of scalable solutions and services that help our global customers navigate the complex journey to more sustainable and efficient energy practices."


Air Products LNG heat exchanger

Clean energy pathway

The size of the investment and the status of Honeywell as a major player across multiple industrial sectors adds weight to the outlook for LNG as a transition fuel.

This is closely related to growth in other clean fuels, with LNG seen as the primary pathway to net zero. As a result, Air Products does not see the sale as an abandonment of its previous work but a necessary continuation as it focuses on becoming "a first-mover delivering clean hydrogen at scale to decarbonize industrial and heavy-duty transportation sectors".

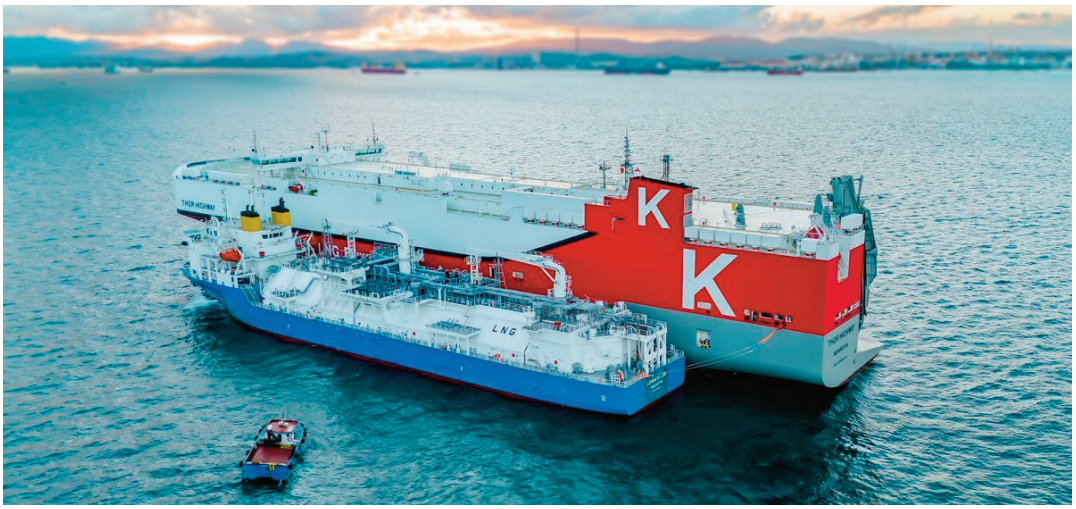
Air Products' LNG business, headquartered in Pennsylvania, employs around 475 people and includes a 390,000-square-foot manufacturing facility in Port Manatee, Florida. This facility is central to the production of CWHEs, which are crucial for efficient LNG processing. ■

Peninsula places LNG at centre of LNG strategy

Growing demand for LNG bunkering in the Western Mediterranean has strengthened marine energy firm Peninsula's strategy around the fuel, with plans to expand its role in decarbonising operations.

The firm's dedicated LNG bunker vessel, *Levante LNG*, began operations at the end of last year, supplying LNG to fleets in the Strait of Gibraltar and Western Mediterranean.

"Certainly, we've seen an uplift in interest in LNG from our customers in recent months," a spokesperson for the firm said. "From supplying the Royal Caribbean Group's cruise vessels *Silver Nova* and *Icon of the Seas* to Eastern Pacific's tanker *Starway*, MSC's containership *Virginia* and, more recently, K Line's *PCC Thor Highway*, our Levante LNG bunker vessel has indeed been busy."



Levante LNG* refuelling the *Thor Highway

Regulatory pressure

The 12,500 cubic-meter bunker vessel, *Levante LNG* was first proposed three years ago, as a joint venture with ENAGAS' affiliate Scale Gas and developed in Hyundai Mipo Shipyard, South Korea.

Since then, regulatory pressure has catalysed LNG's growth trajectory and it is now ranked as the most popular alternative bunker fuel, by standard agency DNV, some way ahead of second place option methanol.

"Last January, we saw the EU Emissions Trading System come into effect for the maritime sector," Peninsula states. "Ship operators are now effectively accruing a bill on their emissions for any voyages with a port of call in the EU, and shipping companies will soon need to surrender EU allowances corresponding to their reported aggregate emissions for 2024."

Flexible routing

The increasing infrastructure for LNG bunkering in Europe is also playing a crucial role in its adoption. As bunkering capacity improves, it becomes easier for ships to access LNG supplies globally, supporting the maritime industry's constant need to reroute and adapt to new logistical challenges.

"This is good news because as demand for LNG bunkering grows, LNG infrastructure is also improving, making it easier for ships to access LNG supplies all around the world," the Peninsula spokesperson adds. "For a global industry that constantly grapples with rerouting, that's crucial."

Looking to the future, Peninsula is optimistic about the continued growth of LNG as a marine fuel. The firm is investing in further expanding its LNG capabilities and exploring innovations in bio-LNG and synthetic LNG. These developments promise to enhance the environmental benefits of LNG even further, supporting the industry's long-term sustainability goals.

"By transitioning to LNG now, which is readily available, ship operators and owners can slash their CO2 emissions by around 25%," Peninsula concludes. ■

Levante LNG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Cuxhaven advances LNG infrastructure strategy

Authorities at the port of Cuxhaven in Northern Germany have completed the first-ever LNG bunkering operation by ship, paving the way for further infrastructure in the area.

The refueling operation was completed on behalf of Dutch dredging specialist Van Oord and carried out by LNG solutions provider Titan, utilizing their bunker vessel *Optimus*.

"Our ship-to-ship bunkering in Cuxhaven represents a pioneering step in the region's LNG infrastructure development, as the port had previously only seen LNG operations conducted via truck and currently only permits LNG bunkering at one berth," a spokesperson for Titan said. "*Optimus* swiftly, safely and successfully delivered LNG to the dredger *Vox Ariane*, operated by long-term client Van Oord."

LNG tanker in harbour

Clean fuels transition

The move is part of a wider strategy in Germany to bolster the role of LNG in the country's energy transition plans. Since the outbreak of war in Ukraine the country has seen a rapid pivot away from pipeline gas, and demand for LNG growing.

"LNG infrastructure development is part of a broader trend, with more ports across Germany adopting LNG operations to support shipping's clean fuels transition," Titan notes.

Cuxhaven is owned by maritime group Niedersachsen Ports and the introduction of improved LNG bunkering capabilities at the site is expected to open up new pathways to maritime decarbonization, via liquified biomethane (LBM) and even renewable e-methane.

Founded in 2012, Titan specialises in end-to-end clean fuel solutions, providing project planning, supply and delivery, as well as risk management and hedging services.

National Ports Strategy

In March this year, Germany's federal government launched its National Ports Strategy, designed to transform the country's ports into sustainable hubs for the energy transition and climate-neutral shipping.

"Aligning the capacities of seaports with the goals of the energy transition is a great opportunity. The examples of Esbjerg and Eemshaven show this," Stefan Thimm, managing director of the Federal Wind Energy Offshore Association (BWO), said.

As part of the new strategy, the government has pledged to finance a 30-hectare expansion of the offshore terminal. This project is estimated to cost for around €300 million, with the state of Lower Saxony allocating €100 million, and the private port industry contributing €100 million through concession fees. ■

STS bunkering operation

NEWS NUDGES

Crown LNG advances Grangemouth FSRU plans

Engineering solutions provider Crown LNG has announced progress on its project to develop a floating storage and regasification unit-based LNG import terminal in Scotland.

The US-lsited firm has now partnered with civil and structural engineering company IKM Engineering & Environmental Consultants (IKM) for the SU$533 million FSRU project. The partners will now work on plans for the proposed facility, to be located in the Firth of Forth near Grangemouth. ■

First Gen Expands LNG collaboration with Tokyo Gas

Filipino energy group First Gen has expanded its partnership with Japanese conglomerate Tokyo Gas, to develop new LNG projects as part of the energy transition.

The new agreement builds on previous collaboration efforts on the Batangas LNG import terminal in the Philippines and will see Tokyo Gas support the development of new LNG terminals and infrastructure across the Philippines.

"Tokyo Gas has supported us all through the development and then the construction. So, they're now excited to become a shareholder," First Gen Executive Vice President Jonathan Russell said.

Tokyo Gas signed new shareholders' and share subscription agreements to take a 20% equity stake in subsidiary firm unit First Gen LNG, the owner and operator of the new LNG infrastructure.

Batangas FSRU

Earlier this year, First Gen LNG awarded its second contract for shipment of LNG to its BW Batangas Floating, Storage and Regasification Unit (FSRU) to CNOOC Gas and Power Trading. The fuel will be used to power gas-fired plants located in the First Gen Clean Energy Complex (FGCEC).

"Today, the First Gen Clean Energy Complex houses our Santa Rita, San Lorenzo, San Gabriel, and Avion natural gas power stations and we've completed testing and commissioning of our LNG terminal and floating storage and regasification unit vessel, the BW Batangas," Federico R. Lopez, CEO of First Gen, explains.

The *BW Batangas* arrived in the Philippines in June last year to commence operations at the second LNG import facility in the Philippines. First Gen's latest deal will see CNOOC deliver LNG fuel to storage tanks at the FSRU that is currently berthed offshore in Batangas City. In August last year, LNG giant Shell supplied the first LNG cargo for commissioning purposes to First Gen's FSRU-based LNG terminal.

LNG transition

First Gen currently operates four gas-fired power plants with a combined capacity of 2,017 megawatts but has ambitious plans to expand this portfolio as part of a strategy that places LNG at the centre of the country's energy transition.

The firm has allocated investment of US$1.27 billion for capital expenditure, with around US$670 million designated for its EDC subsidiary and the remainder to be spent on ongoing LNG projects.

First Gen now aims to reach generating capacity of 13,000 MW by 2030, a sharp increase from its current network of 3,500M. Alongside LNG development the firm is also planning four geothermal power plants with a combined capacity of 82.6 MW, and three battery energy storage system (BESS) projects with 40 megawatt-hours (MWh) of total capacity. ■

Batangas Clean Energy Complex

HAM, Limagas launch LNG joint venture EVA

Fuelling services firm HAM Group has partnered with Peruvian energy group Limagas to launch a new joint venture called Energía de Valor Ambiental (EVA), with the aim of promoting the use of LNG as an energy transiton fuel.

The partners will focus on developing infrastructure to support LNG's use for road transport as well as introducing compressed natural gas (CNG) for passenger cars, light vehicles and trucks.

"With the creation of EVA, HAM Group HAM and Limagas reinforce their presence in Peru, developing an important growth strategy and taking advantage of the possibilities that Peru offers to promote the use of natural gas for vehicles in the country, becoming a benchmark in the Latin American energy field," a spokesperson for HAM said.

HAM mobile LNG service station

Pan-American link

The joint venture aims to build and operate between 10 and 15 service stations before December 2025.

"The first service stations that EVA will open will be located along the Pan-American Highway, a road system that links almost all the countries of the American continent with its more than 17,800 km," the spokesperson continued.

Headquartered in Barcelona, Spain, HAM Group provides LNG, biomethane and alternative energy services including construction of regasification plants, construction of tankers, gas stations, cryogenic tanks, liquefaction plants and biomethane plants, mobile-vehicular and maritime gas stations. The firm estimates that it has designed and built one out of every four LNG service stations in Europe and has undertaken more than 300 projects worldwide.

In 2022, the group acquired a stake in Peruvian firm Limagas Movilidad, expanding its construction and management of vehicular natural gas service stations, as well as other lines of business such as commercialization of LNG for river, rail and mining transport.

The group acquired a 40% stake through its subsidiary HAM Criogénica Peru, and aims to become a benchmark in the Latin American energy field, investing over the next few years in the development of the first Peruvian service stations for LNG, for long-distance transport, and compressed natural gas, for passenger cars, vehicles light and trucks.

Mala LNG start-up

The new LNG refuelling hubs on the Pan-American Highway will be located in Mala, Nazca and Arequipa, with the Mala LNG service station having already begun operation in June.

"It is expected that Nasca and Arequipa will be able to begin offering service during the second half of the year," the firm predicts.

Limagas is a subsidiary of Lipiandes, an Andean multinational company that contributes to sustainable development through the supply of gas and hydrocarbon-based energy solutions across Latin America. ■

New US pollution rules impact LNG project investments

New air pollution rules introduced by the US White house may limit LNG investment in the country, as tighter thresholds threaten to limit construction of new projects.

The regulation around fine particulate matter has been introduced by the Biden government in a bid to improve air quality but will see the Federal Energy Regulatory Commission (FERC) monitor LNG projects more closely.

"FERC is going to have to take this issue seriously and is going to have to analyse whether these projects are in the public interest given this new reality," Tom Gosselin, staff attorney at the Sierra Club, said. "We plan to hold FERC's feet to the fire to ensure that it follows through and satisfies its legal obligations."

Federal Energy Regulatory Commission (FERC)

Investment uncertainty

Under the new rules, FERC will monitor fine particulate matter to ensure it is in the allowed range from 12 to 9 micrograms per cubic meter. The regulation is forecast to have a dampening effect on projects, even in the case where they meet or greatly exceed this limit, as developers are forced to meet tougher administrative barriers.

"Anytime that you introduce uncertainty into the regulatory process it creates challenges," Charlie Riedl of the Center for LNG, comments. "It's difficult to make multibillion dollar investments, which is what these companies are trying to do in building and constructing these facilities... when there is this ambiguity in the regulations."

The latest example has been the CP2 project, under development by Venture Global, in Louisiana. This US$10 billion project is forecast to be one of the largest in the US, and was forced to submit technical details to FERC to prove its air quality impact, following a submission by the Sierra Club.

Calling the request an "eleventh hour data request", Venture Global has been highly critical of the added overhead and delay it has entailed, further highlighting that it could "encourage further baseless claims".

FERC approves CP2

Despite these delays, FERC finally approved the CP2 LNG facility in June, following a further review. This now paves the way for the landmark project, located in Cameron Parish, Louisiana, to begin construction.

Once complete the CP2 facility will have a nameplate capacity of 20 million tonnes per year. initial capacity has already been agreed for 20-year sales contracts, with major energy firms including ExxonMobil, Chevron, JERA, New Fortress Energy, INPEX, China Gas, SEFE, and EnBW signing terms.

"The project will be critical to global energy security and supporting the energy transition, as well as provide jobs and economic growth across Louisiana and the US," Mike Sabel, CEO of Venture Global, said following the FERC decision. "We look forward to a swift non-FTA approval from the US Department of Energy for this project that it critical to both global and national security." ■

Illustration of CP2 LNG facility

NEWS NUDGES

Fairfield chemical carriers expands fleet with LNG dual-fuel tanker

Connecticut-based Fairfield Chemical Carriers has taken delivery of a new LNG dual-fuel chemical tanker.

The vessel, built by Japan's Fukuoka Shipbuilding, marks a significant step in the company's commitment to sustainable shipping practices and is the third in a series of four LNG dual-fuel stainless steel chemical tankers.

The addition follows the all shares acquisition of Fairfield Chemical Carriers by Japan's Mitsui O.S.K. Lines (MOL) for $400 million in March. The move further expands the Japanese shipping lines chemical tanker operations. ■

Florida marks US first double LNG STS operation

Authorities at Port Canaveral in Florida have announced completion of the first double ship-to-ship bunkering operation in North America.

The landmark fuelling operation involved two cruise ships - *Utopia of the Seas* and *Disney Wish* - which have a combined capacity for almost 10,000 guests.

"Two ATB tug-barges provided ship-to-ship LNG refuelling of two LNG-powered homeported cruise ships at Port Canaveral," a spokesperson for the port said, adding that fuel was bunkered "while each vessel was alongside their cruise terminals."

Pivotal moment

Refuelling operations were carried out by bunker vessels *Clean Canaveral* and *Clean Everglades*, with fuel supplied by JAX LNG, a joint venture between Pivotal LNG and Seaside. *Clean Everglades* was delivered to Seaside LNG in October last year and is similar in design, capacity and appearance to its sister ship, the LNG barge *Clean Canaveral*.

LNG has been at the centre of planned development at the port for some time, but a lack of infrastructure has prevented simultaneous bunkering of ships. The use of dual bunker vessels now enables more port calls, and greater uptake of LNG.

"Port Canaveral holds the distinction of being North America's pioneering port for LNG fuelling of cruise vessels. By the close of 2024, we will have four homeported ships fuelled by LNG," Cory Dibble Director at Port Canaveral, says, "Our role is centred on operational support for fuelling LNG-powered vessels."

North 8 berth

To achieve its long-term aims around LNG, the port authority is investing in a new multi-user cruise terminal at the Port's existing North 8 berth.

LNG bunkering at Port Canaveral

The new terminal at North 8 berth will share its basin with the Port's Cruise Terminal 5 on the northside of Port Canaveral. Designed and constructed in 2018 for multi-purpose use, the new site will require minimal modifications to extend its current bulkhead from 1,020 to 1,344 linear feet. The site will then be able to accommodate larger cruise vessels, further enhancing its operational capabilities.

"A new cruise terminal and the business it will deliver builds on our Board's commitment to the economic prosperity of our Port community," Micah Loyd, Chairman of the Canaveral Port Authority Board of Commissioners, notes.

Port Canaveral was the first cruise port in the US to offer LNG bunker fuel, when it launched LNG operations in 2021. ■

Carnival orders three largest LNG cruise ships in fleet history

Cruise ship operator Carnival Corporation has ordered three new LNG-powered ships, the largest vessels in fleet to date.

The significant order adds momentum to LNG's role as a transition fuel in the leisure industry, as Carnival Corporation is the largest cruise company in the world.

"We are proud to be known as America's cruise line with tremendous guest loyalty and an outstanding team that has enabled us to deliver memorable vacations to over 100 million guests," Christine Duffy, president of Carnival Cruise Line, said.

Record Italian order

The new vessels will be constructed by Italian shipbuilder Fincantieri based on unique designs for a new class of vessel. Each ship will weigh in at nearly 230,000 gross registered tonnes, with orders contingent upon financing, which is expected to be completed later this year.

"We are excited to join forces with Carnival Cruise Line to debut a new class of ship, which will be the largest cruise ship ever constructed by Fincantieri and the largest ship ever built in Italy," Pierroberto Folgiero, CEO of Fincantieri, said. "We are proud of the role Fincantieri has played in helping Carnival Corporation secure its position as the world's largest cruise company and look forward to continuing this success story together."

Carnival cruise ship

Design details and itinerary information for the new Carnival Cruise Line ships will be announced in due course, with delivery of the three ships scheduled for the summers of 2029, 2031 and 2033, respectively.

Newbuild pipeline

The addition of the new ships will take Carnival Corporation's LNG-powered fleet to 16 ships and follows five new ship orders for Carnival Cruise Line announced in 2024. These marked the first newbuild orders in five years, and include two new Excel-class ships that will join the Carnival Cruise Line fleet in 2027 and 2028.

"At this point, our newbuild pipeline is just one delivery in each of 2025, 2027, 2028, 2029, 2031 and 2033. We continue to take a disciplined approach to growth, strategically directing new capacity to the areas of highest demand at a rate of one to two new ships per year," Josh Weinstein, CEO of Carnival Corporation, said.

Headquartered in Miami, Florida, Carnival Corporation is one of the world's largest leisure travel companies, employing workforce of over 100,000 people in nearly 150 countries. The firm operates a fleet over 90 ships visiting hundreds of ports around the world. Its portfolio includes Carnival Cruise Line, Princess Cruises, Holland America Line, Seabourn, P&O Cruises (Australia), Costa Cruises, AIDA Cruises, P&O Cruises (UK) and Cunard. ■

LNG operators monitor new EU methane legislation

As the European Union moves closer to implementing new methane legislation, the landscape for LNG operators looks set to change dramatically as reporting requirements tighten and new opportunities emerge.

The first-ever EU rules to curb methane emissions from the energy sector in Europe were adopted in May and mark the latest step in the implementation of the Green Deal and REPowerEU. For LNG operators a key impact will undoubtedly be in monitoring of boil of gas and leakage, as tightening regulation requires firms to observe the amount of methane that escapes from systems more closely.

"As Brussels takes steps to establish "methane performance profiles" of supplier countries and producers, the demand for better emissions data will ramp up quickly," Ben Cahill, Senior Fellow, Energy Security and Climate Change Program at the Center for Strategic and International Studies, said. "The timeline for the commission to develop and publish a methodology is a concern, given the complexity of methane emissions monitoring, quantification, reporting, and verification".

EU to consider methane impacts from LNG

Administrative overheads

Although the new regulation is still preliminary, the preliminary framework includes plans to establish a methane transparency database. This database will provide public access to data on methane emissions reported by both importers and EU operators. As a result, LNG firms must prepare for heightened scrutiny and potential reputational risks associated with higher methane emissions.

This will also add potential overhead for the LNG sector as firms have to report regularly to the competent authorities about quantification and measurements of methane emissions at source level, including for non-operated assets. It will also oblige oil and gas companies to carry out regular surveys of their equipment to detect and repair methane leaks on the EU territory within specific deadlines.

Regulatory regimes

Alongside the internal requirements for companies operating in Europe there are additional considerations when LNG is traded outside the block as EU requirements can be hard to reconcile with the way US LNG volumes are produced and traded.

"This is a concern since the United States is Europe's largest LNG supplier," Cahill notes "The methane legislation demands data 'at the level of the producer', but U.S. LNG sellers usually do not produce gas themselves, instead buying molecules from large producers or gas marketers. These sellers have limited information on the methane intensity of the gas they purchase, so this EU rule could be difficult to satisfy."

Compounding this issue, a large share of US LNG is sold on a free-on-board basis to traders or aggregators and can then be further resold into multiple regions.

While the fine details still need to be ironed out, the current framework expects measurement, reporting, and verification (MRV) Equivalence by January 2027, when EU importers will be required to prove that MRV contracts originate from countries with measures that are equivalent to or stronger than EU rules.

Beyond this date, Methane Intensity Reporting is scheduled to come into force in 2028 increasing transparency in the LNG market, while Maximum Methane Intensity Values are due to start in 2030, when the EU will impose hard limits to allowable emissions for LNG alongside crude oil and coal imports. ■

LNG carrier at dock

WORLD SMALL SCALE LNG FLEET*

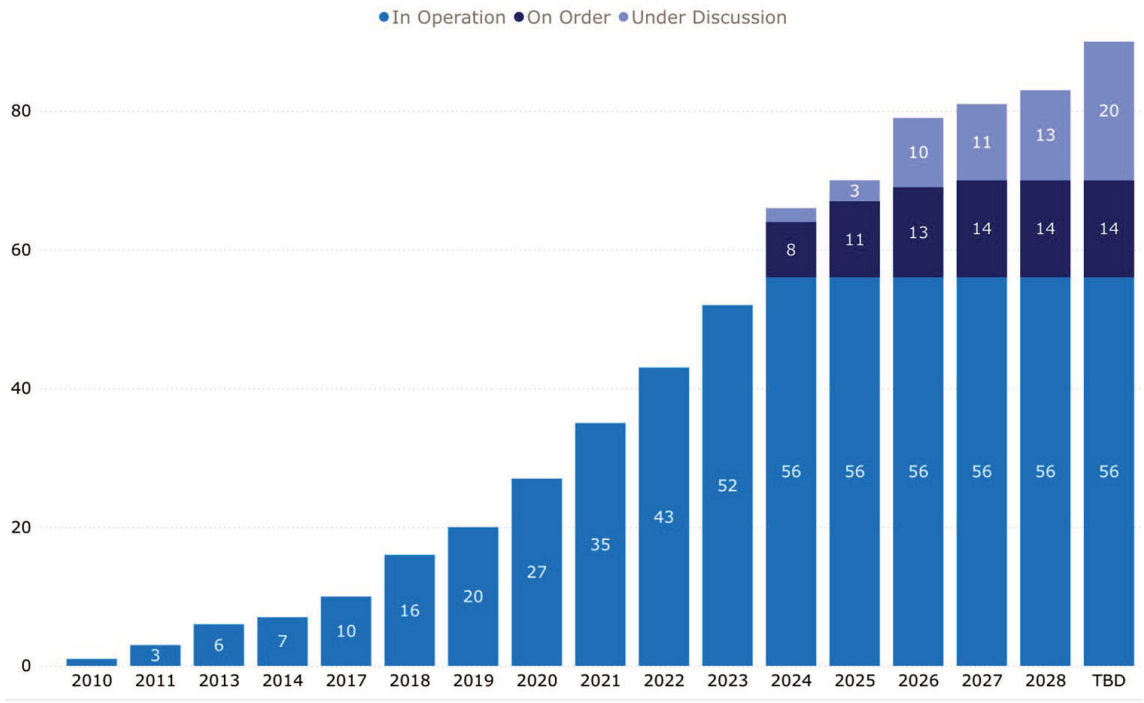
Built	Name	CBM	Cargo Type	Trading Area	Trading in LNG?	Ship Owner / Operator
1974	Seagas	187	LNG	Sweden	Yes	AGA
1988	Kayoh Maru	1,517	LNG	Japan	Yes	Daiichi
1993	Aman Bintulu	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1996	Surya Aki	19,475	LNG	Indonesia - Japan	Yes	MCGC
1997	Aman Sendai	18,928	LNG	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 = 29 July 2024 | For more information please visit http://small-lng.com.

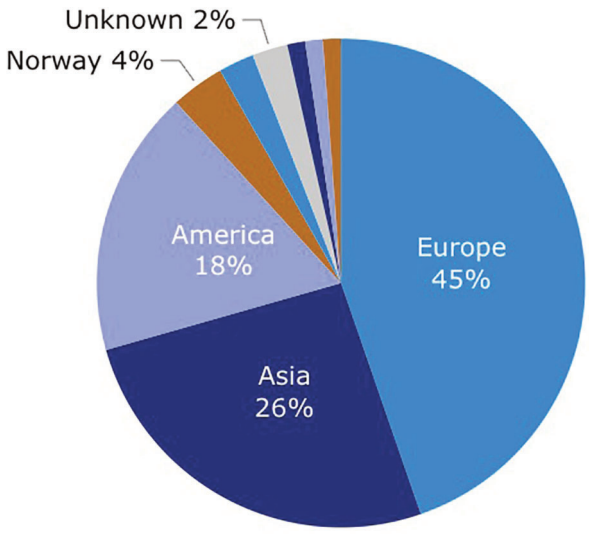
Built	Name	CBM	Cargo Type	Trading Area	Trading in LNG?	Ship Owner / Operator
2020	Avenir Advantage	7,500	LNG	Mediterranean	Yes	Avenir LNG
2020	Avenir Accolade	7,500	LNG	Mediterranean	Yes	Avenir LNG
2020	Avenir Aspiration	7,500	LNG		Yes	Avenir LNG
2020	Kaguya	3,500	LNG	Japan	Yes	CLS
2020	CNTIC VPOWER 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	Crowley TBN	12,000	LNG	US Coast	Yes	Crowley Maritime
2024	CNOOC TBN	12,000	LNG	China	Yes	CNOOC
2024	TBN	12,500	LNG	Worldwide	Yes	???
2024	Keys TBN	3,500	LNG	Japan	Yes	Keys Bunkering West Japan Co
2024	Seaspan Garbaldi	7,600	LNG	Panama	Yes	Seaspan ULC
2024	Paolina Cosulich	8,000	LNG	Mediterranean	Yes	Fratelli Cosulich
2024	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

Data last updated = 29 July 2024 | For more information please visit http://small-lng.com.

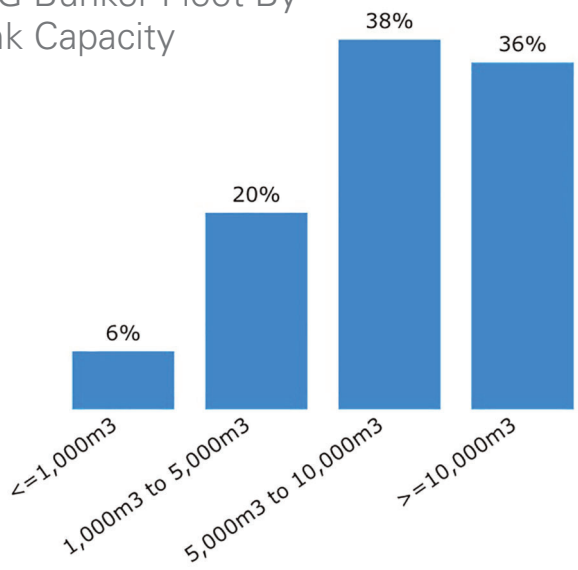
Growth of LNG bunker fleet



LNG Bunker Fleet By Region



LNG Bunker Fleet By Tank Capacity



Location of worldwide LNG bunker fleet by region