LNG Transition

LNG AS A TRANSITION FUEL

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LNG faces methanol challenge in fuel transition

As the global march towards the energy transition accelerates, the role of LNG in this shifting energy landscape is becoming ever more complex. While LNG has long been championed as a bridge fuel, leading towards a cleaner energy future, the timeline for viable alternatives has typically been years, if not decades away.

As dramatic changes in global energy supply have changed the sector in recent years so too has the role of LNG and the roadmap for the energy transition. Today, transformative alternatives such as methanol are not just on the horizon, they are beginning to penetrate the market. This is evidenced by the endorsement of methanol by various industry titans, further heating the debate on the most viable pathway to a sustainable energy future.

In September, Danish shipping giant Maersk inagurated the *Laura Maersk* at the Port of Copenhagen, its first boxship running on methanol. Launched by EU Commission President Ursula von der Leyen, Maersk dubbed it the world's 'first green container ship'.

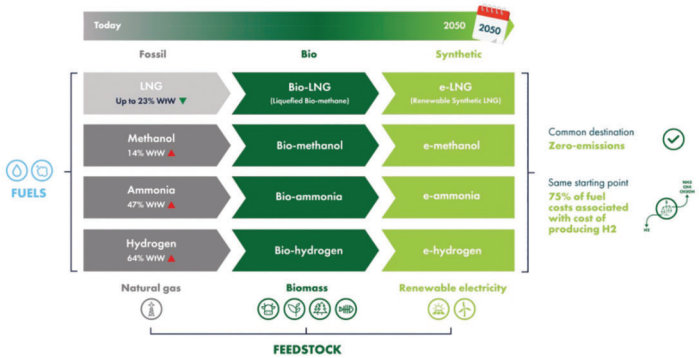
Hailing the launch as "a historic milestone for shipping across the globe", Vincent Clerc, CEO of Maersk said the vessel was "a very real proof point that when we as an industry unite through determined efforts and partnerships, a tangible and optimistic path toward a sustainable future emerges. This new green vessel is the breakthrough we needed, but we still have a long way to go before we make it all the way to zero."

Launch ceremony for the 'Laura Mærsk'

The *Laura Maersk* made its first port call at the Port of Gothenburg in October, one of the few ports worldwide with the infrastructure in place to deliver large-scale methanol bunkering. While this latest bunkering milestone does support the case for methanol, the lack of infrastructure is seen as a major obstacle.

"The production of renewable methanol must increase, and the cost gap between fossil and renewable fuels must decrease," Therese Jällbrink, Head of Renewable Energy at the Port of Gothenburg, cautions. "Responsibility lies with everyone, from producers to policymakers, international maritime organizations, ports, and transport buyers."

Measuring 172 metres in length and with cargo capacity of just 2,136 TEU, the *Laura Maersk* is small compared to modern containerships. Maersk has a policy to only order new vessels that comes with a green fuel option and has 24 additional methanol vessels on order for delivery between 2024 and 2027.



Source: ABS 2021, Sphera 2021 and SEA-LNG analysis

New Entrants

The view that methanol might leapfrog LNG as the fuel of choice for low emission shipping is echoed by several key players in the industry with engine manufacturer MAN amongst its proponents.

Christian Kunkel, Head of Com-

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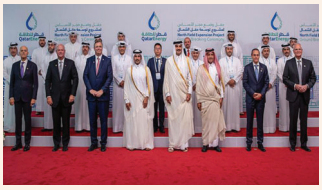


bustion Development, R&D Four-Stroke Engines at MAN Energy Solutions, notes that "methanol is an ideal fuel for converting engines on existing ships and methanol tanks can usually be integrated into existing ship designs without too much trouble, while engine conversion costs can be kept within reasonable limits".

This ability to easily retrofit vessels to methanol is one advantage alongside lower fuel costs, with methanol being roughly half the cost of LNG. Kunkel adds that "with climate-neutral methanol production, the climate effect of the maritime industry can be improved very quickly."

Regulatory compliance

Despite some of these advantages however the outlook is not so clear as the lifetime costs of choosing methanol do not necessarily work out cheaper. Key European decarbonisation targets for shipping through the LNG pathway are expected to be roughly half that of the methanol or ammonia pathways, according to the findings of a new analysis from the SEA-LNG coalition.

The coalition said that the analysis builds on the recent work by the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping (MMMCZCS) projecting fuel costs for alternative marine fuels out to 2050. Using long-term price benchmarks for ammonia, methanol, and LNG as marine fuel, SEA-LNG has calculated the cost of compliance with FuelEU Maritime regulations for a typical 14k TEU newbuild container vessel coming into operation in 2025.

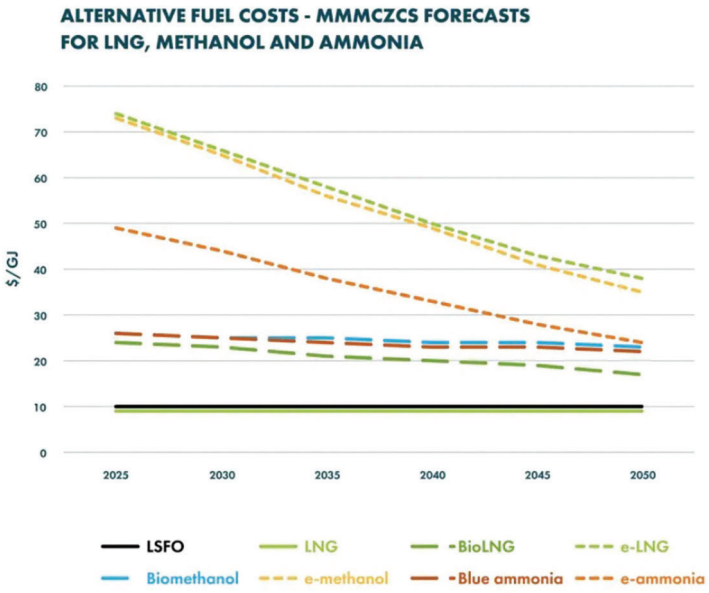
"In the growing excitement about the role that alternative marine fuels can play in decarbonising the shipping industry, little attention appears to be paid to the actual pathway to zero emissions and the potential costs of compliance with emerging regulations," a spokesperson for SEA-LNG comments.

Cost Challenges

In the association's analysis, it notes that almost all currently available alternative fuels including LNG, 'grey methanol' and 'grey ammonia' are produced from natural gas and that truly green alternatives are still not available at scale.

"The negative emission attributes of grey methanol and grey ammonia have major implications for decarbonisation," SEA-LNG states, "To achieve the same emissions reduction as grey LNG, grey methanol and ammonia will need to be blended with significant volumes of very expensive, potentially scarce amounts of green methanol and green ammonia derived from sustainable biomass or renewable electricity."

Port of Gothenburg



Source- MMMCZCS

As a result, assessing long-term average prices reveals a stark picture: with LNG priced at $9/GJ, grey methanol at $21/GJ (Methanex), and grey ammonia at $23/GJ (IEA), it becomes clear that both grey methanol and grey ammonia are at least twice as costly as LNG and LSFO.

Meanwhile, bio-derived fuels present an even pricier alternative - registering a substantial mark-up of up to 2.5 times in comparison to their grey counterparts. Nevertheless, these costs are anticipated to decrease over time, especially with the growing focus on addressing global waste management issues and harnessing the potential advantages of the circular economy.

As well as direct costs, Boil-of-Gas (BOG) is emerging as a major differentiating factor between fuels. In a recent study by Hamad Bin Khalifa University, the economic implications of BOG in the production and transportation of various energy carriers were examined. The results revealed that LNG tanker capital costs could be 15% to 40% higher than ammonia and methanol tankers, while Methanol had 10% to 25% lower transportation cost overall than LNG.

Earlier this year, classification society DNV reported that the gap between methanol and LNG is closing, with orders for methanol-powered vessels passing the 200 mark for the first time. In total, 204 methanol-fuelled ships are now on order versus 949 contracts for LNG-fuelled vessels, excluding LNG carriers.

Despite this growth, Christos Chryssakis, Business Development Manager at DNV urges caution, highlighting that "the cost of fuels like ammonia and methanol presents an issue to shipowners wishing to reduce GHG emissions while also maintaining a profit. The price of these kinds of fuels is currently much higher than conventional marine fuels and shipowners will need to ensure that their charterers will be willing to cover the increased cost of fuels before committing large amounts of CAPEX to retrofitting projects." ■

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Demand grows for energy trading access in Singapore

Singapore's strong LNG ecosystem has seen surge in interest from international companies looking to capitalize on its growing LNG trading market, with Switzerland-based energy trader MET Group the latest to open an office on the island.

Singapore LNG terminal

The firm's Singapore subsidiary - MET Asia - will focus on LNG trading and asset investments, marking the company's first foray into the Asian market. Its Asian business activities will be launched in cooperation with Singapore-based Keppel, a 10% owner of MET Group.

"We expect MET Asia to be a future fuel to our growth story as well as a gateway to participate in the global commodity markets," Benjamin Lakatos, CEO of MET Holding said.

MET Asia will be led by CEO Sándor Fasimon who brings over 25 years' experience in top international management positions for integrated oil and gas companies across Europe, Middle East and Asia.

Energy trading hub

Demand for natural gas in Asia is projected to double by 2050, with countries in the Asia-Pacific region increasingly turning to LNG to support economic development, and Singapore, with its established LNG trading and bunkering hub, is well-positioned to cater to this growing demand.

There are around 60 LNG traders operating in Singapore, including all the world's top 10 global energy traders, and the country has established itself as a key financial hub for LNG transactions. In 2022 alone, approximately US$240 billion worth of LNG trades flowed through Singapore, equivalent to about 50% of the country's GDP.

"We welcome more global energy traders, including LNG players, to set up their trading operations here and expand their activities in Singapore," Tan See Leng, Minister for Manpower of Singapore, commented at the recent GasTech conference in Singapore, noting that "Singapore has developed a strong energy and LNG ecosystem over the years" and was now established "as a leading LNG trading and bunkering hub in Asia".

Additionally, Singapore is actively working towards decarbonizing the natural gas value chain to strengthen the role of LNG as a transition fuel. Measures include upstream flaring mitigation, reduction of methane slip, electrification of production and liquefaction infrastructure, and exploring the use of carbon capture, utilization, and storage technologies. Singapore is also promoting the development of low-carbon and renewable gases like hydrogen and biogas.

Tan also noted that Singapore is collaborating with industry partners to develop a Singapore Standard for Carbon Accounted LNG. This standard aims to calculate greenhouse gas emissions from LNG trades and cover downstream activities such as power generation and data centers. ■

SLNG storage tank

Mitsui warns of LNG supply shortage in global energy transition

Japanese trading firm Mitsui & Co has raised concerns over the amount of LNG available for the global energy transition.

Kenichi Hori, CEO of Mitsui, hailed the importance of LNG as a transition fuel for achieving lower carbon intensity globally but raised concerns about the availability of supply going forward and expected timeframes to deliver new projects.

"Announced projects in the world still won't make up for the supply needed when considering the energy transition that will take several decades," Hori said in comments to Bloomberg.

Hori's comments align with the outlook of several major exporters, that have called for greater investment to meet targets, especially as war in Ukraine and the Middle East threatens to further destabilise global markets.

"LNG is a very important transition fuel for the entire globe to move to a lower carbon intensity state," Hori said, adding that there is "a lot of work to do" to ensure that developments remain competitive, and the portfolios are "well and strategically diversified". ■

Qatar energy minister emphasizes LNG's 'indispensable' role in energy transition

Qatar's energy minister Saad al-Kaabi has highlighted the necessary link between LNG and renewable development in meeting energy transition goals.

Highlighting the growing risks of supply crunches and resulting energy security impacts of new energy source, al-Kaabi predicted that the transition to low-carbon energy will be long and complex.

"Gas will be indispensable, especially given its reliability as a baseload source," Saad al-Kaabi, said during an event in Tokyo, adding that that renewables cannot be "the sole solution" and that gas offered a "cleaner, cost-effective and ready-to-use component of energy transition".

North Field expansion inauguration ceremony in Qatar

Japanese interest

While in Japan the energy minister conducted a number of high-level meetings with officials aimed at boosting LNG exports to the country. Japan is one of a number Asian nations that has accelerated its shift to LNG in recent years, but increased demand is increasingly fuelling competition for relatively limited shipments.

During his visit al-Kaabi met with multiple leading Japanese firms, both in his role as minister and as CEO of national energy firm QatarEnergy, including JERA, Chubu Electric, Tohoku Electric, Marubeni, Mitsui, Mitsubishi, LNG Japan and Japan Bank for International Cooperation (JBIC).

Despite productive conversations, a gap still remains between supply and demand. Hiroshi Hashimoto, senior fellow of the energy security unit at the Institute of Energy Economics, Japan comments that Japanese end-users typically seek short to mid-term LNG contracts whereas more long-term, large-scale contracts could be more beneficial if Japanese portfolio players or consortiums aggregated purchases.

"[Qatar] is an extremely favourable and credible supply source on supply conditions, except for pricing and destination conditions," Hashimoto adds.

North Field expansion

Adding to momentum for Qatar's LNG exports is the massive expansion of the state's North Field reserve. In early October, Sheikh Tamim bin Hamad Al Thani, Emir of Qatar, laid the foundation stone of the North Field expansion project.

'There is no doubt that these additional quantities of natural gas are of great importance as they will play a prominent role in enhancing energy security, supporting a practical and realistic energy transition, and ensuring fair and equitable access to cleaner energy for a sustainable growth and a better future for all," al-Kaabi said.

The huge new North Field project will raise Qatar's LNG production capacity from 77 million tons per annum (MTPA) currently to 126 MTPA by 2026. ■

Haisla Nation makes progress on Cedar LNG FID

The world's first indigenous majority-owned LNG project has made progress this quarter as developers close in on a final investment decision by the end of the year.

The project had initially been planned to close its investment round earlier this year but delays announced in the summer pushed back the deadline as joint venture partners grappled with the complexities of technical, environmental, and commercial challenges.

The project aims to launch a floating LNG facility in Kitimat, British Columbia, connected to the mainland via an 8.5-kilometre pipeline. It is under development by Cedar LNG, a joint venture between the Haisla Nation and energy infrastructure heavyweight Pembina Pipeline.

Highlighting "detailed commercial discussions and ongoing negotiations between LNG Canada and Coastal GasLink", a spokesperson for Cedar LNG explained that final investment was still pending a second front-end engineering design (FEED) report.

Lowest-emitting LNG facilities globally

Despite this delay, partners are now closing in on terms and expect the facility to soon become a key player in the country's energy transition plans as Canada aims to accelerate LNG infrastructure.

Cedar LNG's proposal of a floating LNG facility promises to export three million tonnes of LNG every year and reflects an intersection of economic and environmental milestones for Canada. Not only will LNG exports fuel leaner power in foreign markets but the new facility will also be powered by renewable hydroelectricity, cementing its status as one of the LNG facilities with the lowest emissions worldwide.

"Our project is strategically positioned to leverage Canada's abundant natural gas supply and British Columbia's growing LNG infrastructure," said a Cedar LNG spokesperson. "By powering our facility with clean, renewable energy from BC Hydro, it will be one of the lowest carbon intensity LNG facilities.

Artist's rendition of Cedar LNG facility

Competitive profile

Parallel developments, most notably in the U.S. LNG sector, highlight the increasingly competitive landscape of the LNG industry. For example, American energy companies, like Sempra LNG and Cheniere Energy, have similarly committed to powering operations primarily through renewable energy.

The recently initiated EPC contract for the Vista Pacifico LNG project, has announced it aims for the lowest carbon intensity of any North American LNG project, exemplifying the tightening race towards sustainable LNG production.

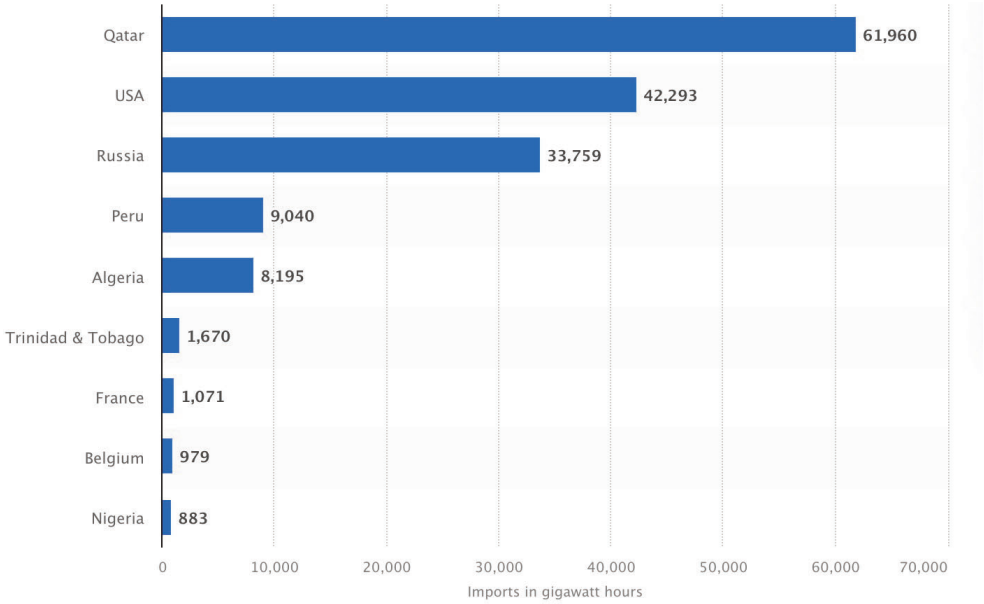
Despite this competition, Cedar LNG remains confident noting that the new facility will outperform, and "leverage Canada's abundant natural gas supply" to produce " low-carbon, cost-competitive Canadian LNG [with] one of the cleanest environmental profiles in the world." ■

NSTA findings question UK LNG Imports

A key body responsible for regulating the UK's energy transition has published new analysis showing that North Sea gas is almost four times cleaner than LNG imports.

The findings from the North Sea Transition Authority (NSTA) are based on research comparing the carbon dioxide emissions created per barrel of oil (boe) equivalent produced.

"This analysis highlights the benefits of continuing to produce our own gas, as cleanly as possible, for as long as we consume it, to support domestic energy security and the drive to net zero," Hedvig Ljungerud, NSTA Director of Strategy, said.



LNG imports to the UK in 2021, by country of origin (GWh). Source - Statista

High carbon intensity

The NSTA's analysis shows that domestically produced gas in the UK has a carbon intensity of around 21 kgCO2/boe, nearly four times cleaner than LNG imports, which average at 79 kgCO2/boe.

"The primary causes for the stark difference in emissions are the process of liquefaction - turning the gas into liquid for transport - then transportation via shipping, and finally regasification, turning the liquid back into gas so it can be used," the authors of the report note.

Headquartered in Aberdeen, Scotland, the NSTA regulates and influences the oil and gas, offshore hydrogen and carbon storage industries. It has been tasked with driving the North Sea energy transition and halving upstream emissions by 2030. To do this it has targeted the UK Continental Shelf as a critical energy and carbon abatement resource.

LNG import emissions

At present, oil and gas play a vital role in fulfilling approximately 75% of the nation's energy requirements. Forecasts from official sources indicate that, despite a decrease in demand, these resources will remain pivotal in sustaining energy needs during the ongoing transition towards achieving a net-zero carbon footprint.

The NSTA findings highlight that the majority of UK gas supply is currently imported into the country, with 187mmboe via pipeline and 156mmboe from LNG. In 2022, the UK produced just 38% of its gas supply but this was responsible for only 24% of total emissions associated with gas supply. In comparison, LNG from the US was responsible for 35% of the emissions, despite being only 14% of the supply.

To tackle this mismatch, the NSTA has committed to assess bids for licenses in the 33rd Oil and Gas Licensing Round, with a strategic aim to reduce reliance on carbon-intensive gas imports. These new licenses are envisioned to enhance energy security while aligning with the imperative to cut emissions. In parallel, the NSTA has also supported the UK's first-ever Carbon Storage Licensing Round, with the potential to store up to 10% of total annual UK emissions. The authority has collaborated with the industry to cut emissions from flaring and venting by 50% in the past five years, with a clear directive that routine venting and flaring will be banned for all by 2030.

"The NSTA will continue to work with industry to drive reductions in emissions while also supporting the energy transition,' Ljungerud concludes. ■

The NSTA report details risk for LNG outlook

First LNG-fuelled Panamax coal carrier sets sail

The world's inaugural LNG-fuelled panamax-class coal carrier, *Shoyo* commenced operations in October.

Constructed by Nippon Yusen Kabushiki Kaisha (NYK) and Kyushu Electric Power (Kyuden), the vessel was named at a ceremony in Koyagi Shipyard, Japan. The ship will carry coal from foreign sources to Kyuden's domestic coal-fired power plants and is part of NYK's commitment to fostering a low-carbon society in response to tightening global environmental regulations.

Shoyo underwent its inaugural LNG bunkering at the Tobata port in Fukuoka Prefecture in mid-October utilising shore-to-ship transfer, delivering fuel directly from the onshore handling facility to the vessel. The ship is designed to accommodate both shore-to-ship and ship-to-ship bunkering, the latter involving the supply of LNG fuel from an LNG bunkering vessel to a ship.

The bunkering operation marks the first-ever shore-to-ship bunkering for an ocean-going LNG-fuelled vessel in Japan. From March 2024, a newly constructed LNG-fuelled bunkering vessel is expected to be based in the Setouchi and Kyushu region, helping to facilitate LNG fuel delivery through ship-to-ship bunkering. ■

5th anniversary

Power Play AWARDS

Presented by ExxonMobil

Congratulations to the three winners of the 2023 Power Play Awards!

Once again, there was tremendous support from our Power Play community. Thank you to everyone involved for demonstrating how a mutually supportive environment can help support great business outcomes across all parts of the LNG value chain.

THIS YEAR'S WINNERS BY CATEGORY ARE:

THE RISING STAR

Presented to an outstanding young female professional under 35 years old

Sarah Hanes

Digital Production Operations Engineer, SLB – Digital & Integration

THE AMBASSADOR

Given to a professional who displays outstanding leadership

Rakhi Oli

Global Strategy & Partnerships Development Leader – Low Carbon Business segment, Flowserve Corporation

THE PIONEER

Awarded to an LNG champion demonstrating outstanding business, innovation and/or technology contribution

Jane Mogina

Biodiversity and IFC Advisor, TotalEnergies

Please join us in celebrating our 2023 winners!
We look forward to building off of this momentum in 2024.

ExxonMobil | LNG

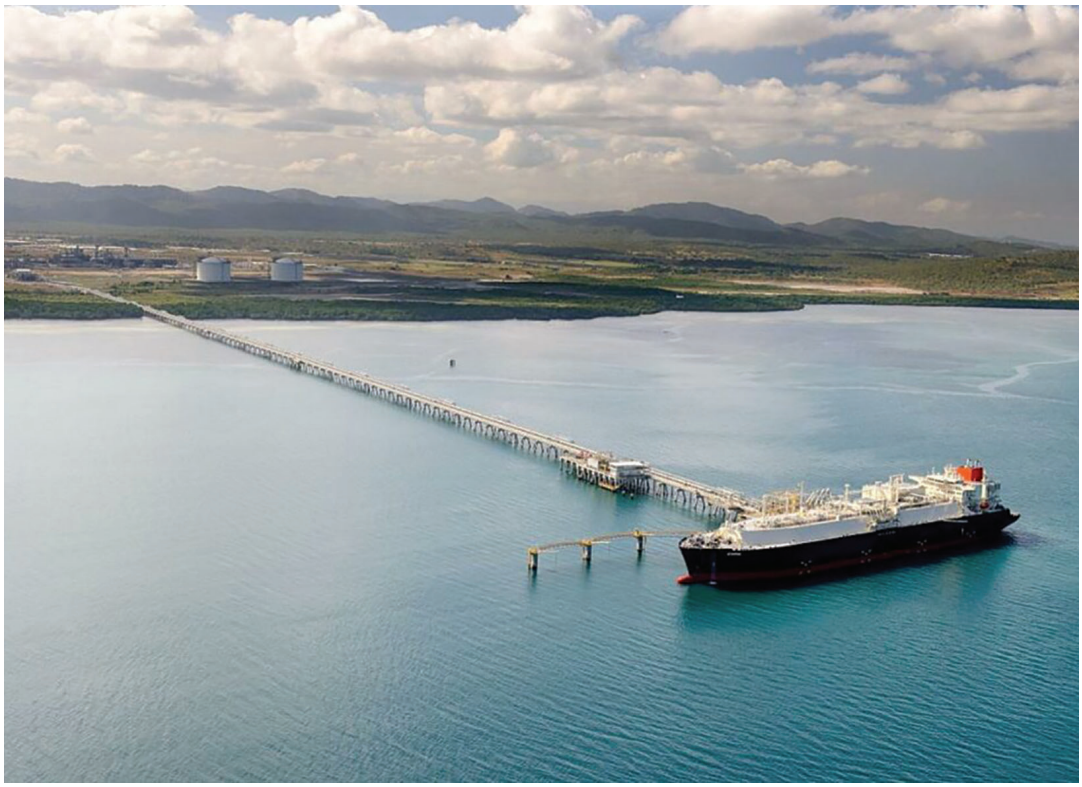
Reclaim Finance criticises TotalEnergies' transition plans

Recent analysis by non-governmental organization Reclaim Finance, has critiqued LNG's role as a pathway fuel in the journey to net zero.

A new briefing from Reclaim Finance has examined claims by French energy giant TotalEnergies that it will be a "major player in the energy transition" and questioned its reliance on LNG to achieve this aim.

"The claims, often repeated by investors, that TotalEnergies is genuinely diversifying its activities to make a real contribution to the transition do not stand up to analysis," Antoine Laurent, advocacy lead at Reclaim Finance states.

Through detailed analysis of the company's forecasts, Reclaim Finance estimates that TotalEnergies build 13 new liquefaction terminals by 2030 will be incompatible with achieving net zero by 2050 on a 1.5°C trajectory.



TotalEnergies is developing the Papua LNG project near Baimuru

Finance pressure

Notably, TotalEnergies' plans for major new gas projects have raised concerns from Laurent, who argues that such ventures contribute to environmental and social risks, undermining the global effort to combat climate change.

"Instead of scaling back its hydrocarbon extraction and transport activities, the oil and gas giant is planning new gas projects, such as Papua LNG, a gas liquefaction and export terminal project in Papua New Guinea," Laurent said. The Papua LNG project is being part supported by the French bank Crédit Agricole, which is acting as financial advisor.

"Papua New Guinea is already suffering the full brunt of climate change. By developing this fossil fuel project, TotalEnergies would be taking us even further into new climate, environmental and social risks. If we are to have a sustainable future, French banks, and Crédit Agricole in particular, must commit to no longer supporting Papua LNG," Peter Bosip, representing the Papua New Guinea NGO CELCOR, said.

Multi-energy strategy

In response, TotalEnergies has defended its position, asserting a balanced multi-energy strategy. The company outlined an ongoing commitment to responsible low-cost, low-emission oil and gas production in its recent Strategy & Outlook Presentation 2023. Noting that, its approach is "anchored on two pillars, Oil & Gas, notably LNG, and Integrated Power, the energy at the heart of the energy transition, the Company is in a very favourable position to take advantage of changing energy prices."

Speaking to investors, Patrick Pouyanné, CEO of TotalEnergies, said. "While drastically lowering the emissions from its operations, TotalEnergies plans to grow Oil & Gas production by 2-3 % per year over the next five years, predominantly from LNG, thanks to its rich low cost, low emission upstream portfolio. ■

SMI research partnership targets ammonia risks

The Singapore Maritime Institute (SMI) has joined forces with key stakeholders to study the safety, mitigation technology, and environmental challenges associated with ammonia bunkering.

Venugopalan Raghavan, Lead Research Engineer at the Institute of High-Performance Computing, A*Star, highlighted the project's objectives, stating, "The project aims to establish advanced modelling and simulation capabilities for ammonia dispersion in sea and air, to develop mitigation technologies for ammonia bunkering in marine environments and assess the environmental impact of ammonia release."

The collaborative effort includes the Maritime and Port Authority of Singapore (MPA), researchers from the Maritime Energy & Sustainable Development Centre of Excellence (MESD) at NTU, A*STAR's Institute of High-Performance Computing (IHPC), and the NUS Tropical Marine Science Institute.

Building upon a prior MESD study, the research initiative aims to explore a wider spectrum of factors influencing ammonia release, encompassing various potential scenarios of ammonia leakage and seeks to develop recommended emergency protocols to address such leaks effectively. ■

Italian LNG infrastructure drives energy mix shift

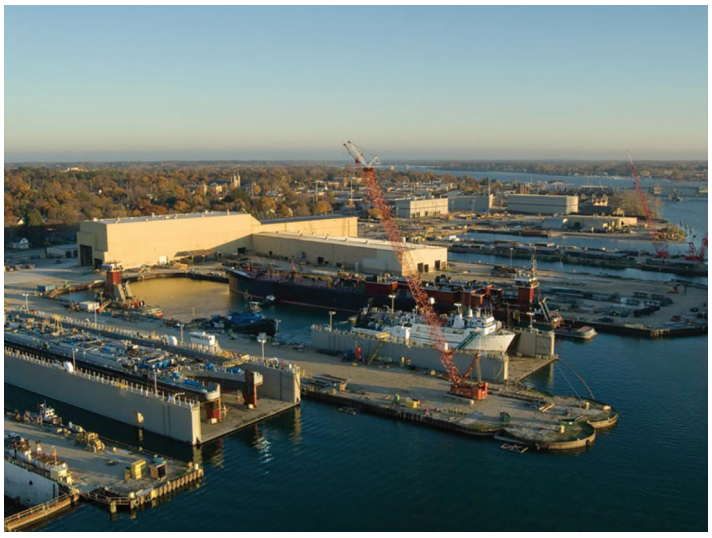
Investors have increased focus on Italy's LNG infrastructure this quarter as the fuel has increasingly taken centre stage in the country's energy mix.

Italian shipbuilder Fincantieri has been at the forefront of LNG design in recent years and recently signed a contract to build an LNG dual-fuel RoPax ferry for the Sicilian Region. The ferry, with a length of about 140 meters and a capacity of 1,000 people and 200 cars, will serve routes between Sicily and the islands of Lampedusa and Pantelleria.

Pierroberto Folgiero, CEO and Managing Director of Fincantieri, commented on the importance of this order, stating, "The strength of our project is, once again, technologies for reducing environmental impact, intercepting the needs of the energy transition."

Including a dual fuel engine powered by LNG or diesel, the ferry also features a photovoltaic system coupled with energy storage, allowing it to remain in port with zero emissions for approximately four hours.

President of Sicily, Renato Schifani stated, "We will improve the quality and safety standards of naval transport for Lampedusa and Pantelleria, with a modern ship that also guarantees great attention to respect for the environment." Italy's focus on reducing environmental impact and embracing cleaner energy sources is driving the adoption of LNG as a pivotal component in its energy transition.



Fincantieri shipyard

Exxon divests

In a separate development, Exxon Mobil announced the sale of its majority stake in Italy's main LNG import terminal to global investment management firm BlackRock. The move is in line with Exxon's strategy to divest non-core assets and reflects the growing importance of LNG in Italy's energy mix.

Exxon's stake stood at 70.7% of Adriatic LNG via its subsidiary ExxonMobil Italiana Gas, with QatarEnergy holidng a furhter 22% stake and state-controlled gas grid operator Snam holding 7.3%. The LNG import terminal is Italy's largest and is located off the Adriatic coast in northern Italy.

It is believed that Snam will now raise its stake in Adriatic LNG to 30% to obtain governance rights on the LNG import terminal. New regasification terminals and greater LNG imports in Italy have been a focus of EU after the Russian invasion of Ukraine. It coincdides with the halt of Russia's Nordstream gas pipeline. ■

Piombino welcomes first LNG cargo

Italy's newest LNG import terminal, located in Piombino, welcomed its inaugural commercial LNG shipment from a Sonatrach liquefaction plant in Algeria in the third quarter.

Italian energy company Eni handled the delivery and announced the successful delivery of a 90 million-cubic-metre LNG cargo to the terminal. The delivery follows an initial non-commercial cargo provided in May 2023.

Eni has outlined ambitious plans for LNG, stating, "Contracted LNG is expected to exceed 18 million tonnes per annum by 2026, twice as much as in 2022. This confirms LNG's role as a reliable energy source in support of security of supply and the energy transition." The firm also anticipates the cessation of Russian gas imports in Italy within the next two years.

The terminal's operational capacity is set to reach two billion cubic meters of gas by the end of this year, and an impressive five billion cubic meters per year the following year. This projected increase is equivalent to 7% of Italy's annual gas demand, underscoring the terminal's crucial role in the country's energy landscape. ■

Artist's rendition of LNG-fuelled RoPax ferry

Hong Kong takes leap towards energy transition

The inauguration of Hong Kong's first Floating Storage Regasification Unit (FSRU) earlier this year has marked a significant milestone in the special administrative region's energy transition plans.

The long-awaited LNG terminal has been hailed as a crucial tool in Hong Kong's power generation roadmap. with the authorities emphasizing its importance as part of a secure and stable energy ecosystem.

Located to the east of the Soko Islands, the FSRU is named *Bauhinia Spirit* and is operated by a joint venture CLP Power and HK Electric, under long-term time charter agreement with Japan's MOL. The partners are the main two main electricity generation companies, with CLP Power providing electricity to more than 80% of Hong Kong's population.

The terminal, which is located to the east of the Soko Islands, went into service in July and was inaugurated with an official opening ceremony in September.

Upgraded capacity

After undergoing upgrades at Keppel Shipyard in Singapore, the unit now boasts an nominal regasification capacity of 600 million cubic feet per day and a maximum of 800 million cubic feet per day. Alongside the FSRU, the terminal comprises a double berth jetty, and subsea pipelines. It operates under a long-term LNG supply agreement signed with Shell in 2019.

John Lee Ka-chiu, Chief Executive of Hong Kong, praised the ground-breaking nature of the offshore LNG terminal, emphasizing its role as a unique infrastructure supporting Hong Kong's commitment to carbon neutrality.

The inauguration followed the successful arrival of the first cargo under a long-term agreement with LNG giant Shell. The shipment, comprising approximately 139,000 cubic meters of LNG, was delivered to the 263,000-cbm FSRU *Bauhinia Spirit*, stationed at the offshore terminal under a charter deal with MOL.

Bauhinia Spirit

"The facility will further improve Hong Kong's long-term natural gas supply stability by diversifying supply sources and enable procurement of LNG from the international market at competitive prices," remarked a spokesperson for HK Electric.

Shift to LNG

The majority of energy use in Hong Kong is currently based on coal or oil but the city's energy landscape is currently undergoing a transformative shift. Between 2012 and 2022, primary energy requirements (PER) decreased by 14.7%, with a notable decline in coal and oil dependence.

In 2022, 66.5% of PER was attributed to coal and oil products for electricity generation, whereas revenue from local gas sales surged by 7.0% to $8.3 billion. The introduction of the LNG import terminal aligns with Hong Kong's emission reduction initiative, as the city strives to replace approximately half of its power generation fuel with natural gas. The regasified LNG from the unit will be delivered to two key power plants — the Black Point power station in the New Territories and the Lamma power station situated on Lamma Island. ■

The FSRU berthed at Hong Kong

Hindustan Zinc embraces India net-zero targets with LNG-powered fleet

In a move to reduce its carbon footprint, Indian mining firm Hindustan Zinc, has announced plans integrate the LNG-pwoered fleet of GreenLine Mobility Solution into its supply chain.

The collaboration aims to support Hindustan Zinc's ambitious goal to become a net-zero carbon emitter by 2050, as well as contributing to India's efforts to achieve net-zero by 2070.

Arun Misra, the Chief Executive of Hindustan Zinc, expressed the company's commitment to decarbonizing Indian mining and emphasized the transformative impact of introducing LNG vehicles, stating, "By introducing LNG vehicles, we are not just showcasing our commitment towards decarbonizing Indian mining but also paving the way for a transport revolution."

India, as the world's third-largest emitter of greenhouse gases, is witnessing substantial investments from companies to align with the nation's commitment to sustainable practices.

GreenLine Mobility Solution, promoted by Essar Group, has pledged a significant investment of 2 billion rupees to deploy LNG-powered trucks for Hindustan Zinc's road logistics. This strategic move underscores the growing awareness within the Indian industrial landscape to greener solutions. The partners state that this move represents a crucial step in revolutionizing the transportation sector in India, demonstrating "the potential for LNG to play a significant role" in cutting emissions and promoting environmentally friendly practices. ■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MPA urges further investment in LNG as transition fuel

Singapore's Maritime and Port Authority (MPA) has called on the global shipping industry to accelerate plans to make LNG greener in order to cement its role as a transition fuel.

The prospect of tightening emissions standards has long been a driver for LNG investment but Chief Sustainability Officer at the MPA, Tham Wai Wah, warns that without further acceleration of transition plans, LNG risks getting left behind.

"Should the IMO goal be significantly enhanced... this implies that LNG will need to accelerate its own transition from its current form," Tham said in comments to S&P, exlpaing that net-zero goals already laid out by a number of countries would require new investments to achieve.

Expedited timeline

The use of traditional LNG, sourced from fossil fuel derived natural gas, is expected to make way for a plethora of alternative versions from biogas to syngas but the timeline for this development has typically been vague. While these alternatives are touted to cut greenhouse gases emissions from ships on a well-to-wake basis their technical development remains challenging.

"The process is still quite difficult and very energy consuming," Tham notes, adding that industry ambitions must rise to ensure that net emissions from LNG can fall faster.

Singapore has been at the forefront of LNG bunkering development in recent years, and delivered 47.9 million tonnes of bunker sales in 2022, of which LNG bunker sales accounted for around 16,000 tonnes, according to MPA data.

While still significant this, represents a 68% fall in LNG bunker sales year on year due to soaring costs and tight supply. Prior to this, however LNG has been on a solid growth trajectory in Singapore since the first pilot projects were launched in 2017.

Bunker demand rising

Demand so far this year has been more robust and in May monthly bunker demand in Singapore hit a five-year high. This has prompted the CEO of trading firm Vitol, Russell Hardy, to predict a boom in LNG bunker sales in Singapore and elsewhere in Asia as new vessels are launched.

"There's going to be a huge growth in LNG bunkering over the next few years, there's going to be a huge use in the use of LNG as a road transport," Hardy said in comments to Reuters.

MPA Chief Engineer Tham Wai Wah

Tham reinforced this sentiment, stating that "LNG bunkering is no longer a pilot in Singapore" and predicting that the MPA would "see a rise in demand of LNG compared to last year."

The MPA currently has no plans to issue new bunkering licenses however as Tham states that the three existing LNG bunkering suppliers will be able to support this demand. ■

Developing countries eye LNG transition opportunities

While the majority of discussion around LNG as a transport fuel has been in mature markets to date the medium term opportunities for developing countries are starting to grow. A diverse group of nations from Nigeria to Trinidad & Tobago are now capitalising on LNG as a fuel source as investment interest strengthens.

The Philippines and Vietnam are two of the latest countries to begin LNG imports this year, while the US Energy Information Administration (EIA) predicts that the Caribbean nation of Antigua and the Central American country of Nicaragua will follow suit by the end of 2024.

"Both Nicaragua and Antigua and Barbuda will become new LNG importers, with a combined regasification capacity of 0.1 billion cubic feet per day (Bcf/d)," Victoria Zaretskaya, lead operations research analyst at the EIA, states. "Several more countries are in advanced stages of developing LNG import capacity."

Logistics group Atlantic Gulf & Pacific (AG&P) received the first LNG cargoes in the Philippines in April, launching operations at the country's first LNG import terminal. The tanker vessel *Golar Glacier,* completed a ship-to-ship LNG transfer to the floating storage unit (FSU) ISH. The FSU has a peak LNG loading rate of 10,000 cbm/hr and a discharge-to-shore peak rate of 8,000 cbm/hr.

Vietnam's first shipment of LNG meanwhile was purchased by Petro-Vietnam Gas JSC and delivered in June and July. This followed the release of the country's latest power development plan in May, which brought a renewed focus on wind and LNG for the period through to 2030.

LNG station India

Emerging market benefits

For those developing countries that do not have domestic natural gas resources, the prospect of LNG imports has been prohibitively expensive in recent years as soaring demand has driven up prices. Now that this pressure is waning somewhat however the prospect for new regasification projects to support the energy transition is improving.

"The return of LNG prices to more normalized levels benefits emerging markets the most, as their energy affordability and availability was most impacted by the LNG price spikes last year," Saul Kavonic, a energy analyst at Credit Suisse, notes. "Emerging markets, particularly in south and Southeast Asia, are the core drivers of LNG demand growth over the next 10 years."

EIA figures corroborate this view, predicting that Asia will continue to lead growth in global regasification capacity, accounting for 52% (11.9 Bcf/d) of the total capacity additions in 2023 and 2024. Europe will account for 38%, and the rest of the world for 10% (2.3 Bcf/d).

"Several developing countries are eyeing medium-term opportunities for their own LNG production: namely, Senegal, Mauritania, Mozambique, and Tanzania in Africa, and Trinidad & Tobago in the Caribbean," Alejandra Padín-Dujon of Columbia University says, adding that the contributions "that African and Caribbean countries intend to make the LNG landscape are underreported, but not trivial."

Looking ahead, the growth of LNG in developing countries, may spur a profound transformation in coming years but downside risks remain with Padín-Dujon noting that LNG is still a politically risky bet for aspiring producers in Africa and the Caribbean. ■

Lipigas expands green corridor strategy in Chile

In a significant step forward for LNG infrastructure in Latin America, energy solutions developer Lipigas, is set to add two new LNG filling stations to its existing plans for a 'green corridor' in Chile.

The firm announced two new facilities in the planned network, with the first set to be operational by year end. A new LNG station in Paine, Metropolitan Region, is now set to be operational in December while a second in Puerto Montt, Los Lagos, is estimated to be operational in March 2024.

"LNG is an efficient, proven and available option for the reduction of CO2 on the planet. It is a more sustainable alternative, which allows us to significantly reduce the emissions generated by diesel fuel and by 96% the emissions of particulate matter, in addition to contributing to considerably mitigate noise pollution", Esteban Rodríguez, manager of LNG, Biofuels and Green Hydrogen at Lipigas, explains, adding that "these two new stations that are added to the network will allow us to reach more vehicles".

Lipigas plans to be able to offer renewable LNG form the sites in "the near future", and also promises "an even more sustainable option that we are already working on and that we hope to have available by the end of 2024."

Both the new stations are in addition to those inaugurated in Tabolango, Valparaíso Region in 2022; and in Linares, Maule Region in 2021. They form a key part of the what the company terms 'the first clean energy corridor' for heavy cargo transport in Chile. Its plan is to install refuelling stations at strategic points to supply LNG-fuelled trucks that operate from the north to the south of the country and then expand internationally.

To this end, Lipigas has acquired 60% of Limagas Natural Mobility, a Peruvian company through which it plans to build and operate service stations for the supply of LNG or natural gas for vehicles in that country. In the future, this acquisition is expected to contribute to the extension of the corridor into neighbouring countries.

"Gas will continue to be a high-consumption and relevant energy in Chile," Rodríguez notes. "That is why, as part of the strategy of growth, transformation and diversification, we are working on innovations to make gas, our core business, increasingly efficient and sustainable."

Lipigas LNG facility

To this end, the company is investing US$8 million to build a plant for the production of renewable LNG in the Ñuble Region. Operational by the end of 2024, this plant will process between 7,500 and 16,500 m3 of LNG daily and utilise organic waste as part of a circular economy process. As a result, the LNG produced by the facility is set to be carbon-negative and the fuel from the plant is expected to annually reduce CO2 emissions by over 19,000 tonnes. Furthermore the waste-to-energy process will reduce particulate matter emissions by 96%, and nitrogen oxide and sulfur emissions by 85%.

"The reduction in CO2 will be equivalent to taking more than 6,000 cars off the road or planting more than 38,000 trees," Rodríguez adds.

Headquartered in Temuco, Chile, Lipigas operates in Chile, Colombia, and Peru and specialises in LNG, liquefied petroleum gas (LPG) and natural gas. In Chile, the company entered the natural gas market in 2004, extending its reach to Puerto Montt and Osorno in 2017. Since 2014, Lipigas has been distributing LNG by land to industrial customers, enhancing accessibility to cleaner energy sources. Additionally, Lipigas ventured into electric power generation in 2017 with a small-scale power plant using natural gas. ■

Lipigas LNG tanker

Shell delivers to Avenir LNG Higas Terminal in Sardinia

Energy giant Shell successfully delivered a cargo of LNG to the Higas terminal in early October, supplying 6,000 cubic meters of fuel to the facility on the Italian island of Sardinia.

This marks a significant milestone as Shell becomes the first third-party supplier of LNG to the small-scale facility. Owned and operated by UK-based fuel supplier Avenir LNG, the terminal is located in in Oristano.

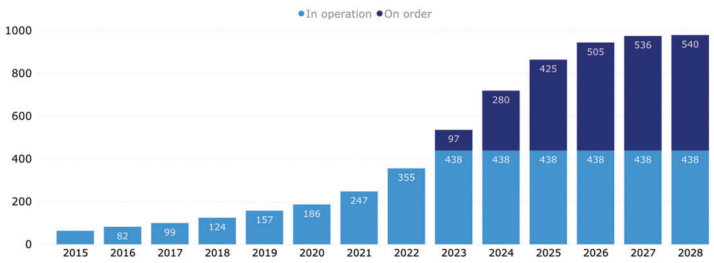
"Due to our complementary LNG positions in the Mediterranean, we were able to optimize our respective supply chains and further enhance energy security for the island," Avenir said.

The bunkering and supply vessel responsible for the operation was the *Coral Methane*, which is chartered by Shell from Dutch shipping line Anthony Veder. The bunker vessel mainly operates in the Mediterranean and primarily loads via Enagas-operated LNG terminals in Spain. ■

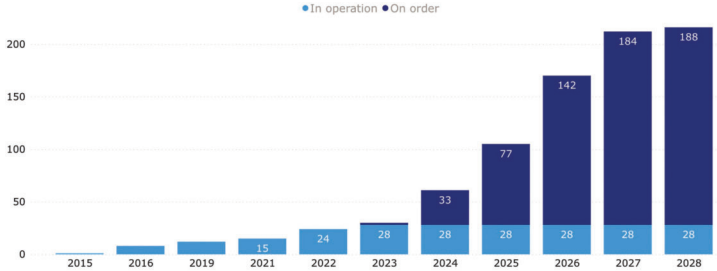
PLANNED NEWBUILD LNG BUNKER VESSELS

Ship name	Fuel	Country	Home port	Project status	Delivery year
Blue Whale	LNG	South Korea		Decided	2023
K LNG Dream	LNG	South Korea		Decided	2023
Alice Cosulich	LNG	Italy	Mediterranean Sea	Decided	2023
OljOla & Stena JV Methanol BV	Methanol	Europe	Northern Europe	Under discussion	2023
Levante LNG	LNG	Gibraltar	Port of Algeciras	Decided	2023
FSU and LNG Bunker Barge, Port of Coega, South Africa	LNG	South Africa	Port of Coega	Under discussion	2023
FSU and Bunker Barge	LNG	South Africa	Port of Coega / Algoa Bay	Under discussion	2023
Brassavola	LNG	Singapore	Singapore	Decided	2023
Cryopeak LNG	LNG	Canada	Vancouver	Under discussion	2023
Ecobunker Tokyo Bay	LNG	Japan	Yokohama	Decided	2023
Petronas LNGBV	LNG	Malaysia		Under discussion	2024
LNG bunker barge GALP	LNG	Portugal		Under discussion	2024
LNG Erasmus	LNG	Europe	ARA	Decided	2024
Oceania Marine Energy LBV	LNG	Australia	Dampier	Under discussion	2024
Polaris ATB No. 2	LNG	United States	Jacksonville, FL	Decided	2024
Eagle LNG caribbean LNGBV	LNG	America	Jacksonville, FL	Under discussion	2024
KEYS Bunkering West Japan LBV	LNG	Japan	Kyushu and Setouchi regions	Decided	2024
Fratelli Cosulich Mediterranean Sea 2	LNG	Italy	Mediterranean Sea	Decided	2024
Kanfer Shipping LNG bunker vessel 1	LNG	--	Not yet decided	Under discussion	2024
Poseidon Med II bunkering barge	LNG	Europe	Revithoussa	Under discussion	2024
TBN	Methanol	Netherlands	Rotterdam	Under discussion	2024
Consort Bunkers 1	Methanol	Singapore	Singapore	Decided	2024
Consort Bunkers 2	Methanol	Singapore	Singapore	Decided	2024
Consort Bunkers 3	Methanol	Singapore	Singapore	Decided	2024
Methanol BV	Methanol	Singapore	Singapore	Decided	2024
Titan Hyperion	LNG	Netherlands	TBD	Under discussion	2024
Domestic LNG Bunkering Vessel in China	LNG	China	To be decided (China)	Decided	2024
Domestic LNG Bunkering Vessel in China	LNG	China	To be decided (China)	Under discussion	2024
Crowley/Shell LNG bunker barge	LNG	United States	U.S. East Coast	Decided	2024
Seaspan LNG bunker vessel	LNG	Canada	Vancouver	Decided	2024
Seaspan LNG bunker vessel 2	LNG	North America	Vancouver	Decided	2024
Seaspan LNG bunker vessel 3	LNG	North America	Vancouver	Decided	2024
TBN	LNG	China	Yangtze River	Decided	2024
Titan Krios	LNG	Belgium	Zeebrugge	Under discussion	2024
Woodside Western Australia LNG bunker vessel	LNG	Australia	Dampier	Under discussion	2025
Net Zero hive Canarias	LNG	Spain	Canary Islands	Decided	2025
Axpo LBV	LNG	Italy	Coast of Naples	Decided	2025
Oceania Marine Energy	LNG		Dampier	Under discussion	2025
Consort Bunkers 4	Methanol	Singapore	Singapore	Decided	2025
Consort Bunkers 5	Methanol	Singapore	Singapore	Decided	2025
Consort Bunkers 6	Methanol	Singapore	Singapore	Decided	2025
LNG bunker vessel Swinoujscie	LNG	Poland	Swinoujscie	Under discussion	2025

Growth of LNG-fuelled fleet



Growth of methanol-fuelled fleet



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