

LNG Fuelling

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Crowley, Shell to develop largest LNG bunker vessel in US

Marine solutions firm Crowley Maritime has partnered with energy group Shell to build and operate the largest LNG bunker barge in the US.

The agreement involves construction of the largest Jones Act-compliant vessel of its kind, which will be operated on a long-term time charter with Shell North America LNG.

"The new bunker barge will extend Crowley's commitment to deliver cleaner, innovative solutions and help the shipping industry continue on the path to decarbonization," Tucker Gilliam, vice president, Crowley Shipping, said.

12,000 m3 capacity

Measuring 416 feet in length, the bunker vessel will be built in the US and will offer capacity for 12,000 cubic metres of LNG. It will also feature advanced technology to extend cargo handling capabilities and increase transfer rates.

"Shell is dedicated to growing our LNG bunkering network across key trade routes, and this barge supports our commitment to helping provide our customers with the energy solution they are looking for," Tahir Faruqi, general manager, Global DLNG for Shell, commented.

The vessel will be the second Jones Act-compliant bunker barge Shell has under long-term charter



Artist's rendition of bunker vessel

in the US and Faruqi predicts it will play a vital role in the country's transition towards decarbonisation, noting that LNG offers "immediate emissions reduction" with the potential to become a net zero emission marine fuel "given the possible roles of bio-LNG and synthetic LNG".

Deployment 2024

The barge is set to be deployed to the US East Coast in 2024 and will be capable of serving a variety of LNG containment systems and ships at ports across the region.

"Orders for ships fuelled by liquefied natural gas continue to rise, and the vessel will provide Shell an innovative and reliable

service to meet demands for more sustainable energy sources," Gilliam concludes.

Headquartered in Florida, Crowley is a family and employee-owned and has developed LNG distribution services since 2013, following its acquisition of Carib Energy. The company was the first to receive an export license for small-scale LNG transportation services from the U.S. Department of Energy and earlier this year it launched a New Energy division, focused on LNG and offshore wind.

"The New Energy division is the next evolution in our prioritization of this market with a singular focus on developing and delivering access and support to more sustainable energy sources to our customers," Matt Yacavone, senior vice president at Crowley Shipping, explained.

The vessel will be fabricated by Fincantieri Bay Shipbuilding at Sturgeon Bay, Wisconsin. Dario Deste, CEO of Fincantieri Marine Group, said: "This additional LNG barge will serve as another demonstration of our commitment to building and servicing sustainable maritime endeavours, both in the United States and globally." ■



Bunker barge during refuelling

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AET completes first LNG bunkering operation in US

Tanker operator AET has completed its first LNG bunkering operation in the US, refuelling a dual-fuel Aframax tanker in Florida.

The bunkering operation involved the transfer of 600 tonnes of marine LNG to the tanker *Pacific Ruby* outside Port Canaveral and was completed over a period of nine hours.

“AET’s investments in dual-fuel solutions underscores our commitment to reduce the carbon footprint of shipping using the best fuel solution immediately available in the market today. At the same time, we are working together with our business partners on longer-term solutions for de-

carbonisation which sees multiple pathways from which we will select the most effective long-term solution for zero carbon vessels,” Captain Ron Wood, AET Global Director of Mid-Size Tankers Crude Shipping, commented.

Q-LNG 4000 bunker barge

The refuelling was completed by the Q-LNG 4000 bunker barge and coordinated with energy major Shell.

Tahir Faruqi, Head of Shell

Downstream LNG, stated that the firm is looking forward “to expanding our network coverage in the US to include the Gulf Coast and the East Coast with the recent in-

vestment of two additional LNG bunker vessels. We congratulate AET on the progress they are making in their decarbonisation journey and are very happy to be collaborating with them.”

A wholly owned subsidiary of Malaysian energy shipping corporation MISC Berhad, AET anticipates “significant growth” in the global fleet of LNG-fuelled vessels in parallel with an increase in LNG bunkering infrastructure.

‘Clear choice’ for emissions reduction

Faruqi applauded the commitment to LNG a marine fuel saying, “the shipping sector must find fuels for the long-term, but also act today. LNG is a clear choice for immediate reduction in shipping

emissions. It is a fuel in transition that offers potential pathways via bio and synthetic LNG for developing zero emission options. Shell is already offering LNG bunkering services in 10 countries and 15 ports to support the shipping sector.”

To date, AET has invested in 11 LNG dual-fuel vessels, with three Aframaxes already in operations in the Atlantic, with Captain Wood noting that the firm is ‘very pleased’ that Shell provides LNG fuelling along the ‘important transatlantic trade route’.

Another AET Aframax is set to be delivered for operation in the Pacific later this quarter, adding to two DPSTs operating in North and Barents Seas. Five dual-fuel VLCCs are at newbuilding stage to be delivered in 2022 and 2023. ■



AET bunker operations

Petronas completes first LNG bunkering in Sabah

Oil and gas firm Petronas has conducted its first LNG bunkering operation on the island of Borneo, refuelling via its dedicated LNG bunker vessel, *Avenir Advantage*.

The bunker operation was completed by the firm’s subsidiary Petronas Marine and involved refuelling the world’s largest LNG-powered vessel, the HL Green. Bunkering was carried out 12 nautical miles from Sandakan Port in Sabah, the Malaysian-controlled sector of the island.

“Along with our previous operations at Port Klang in Selangor and Sungai Udang Port in Melaka, this latest effort signifies a major step towards developing Malaysia as an LNG bunkering hub,” Emry Mohd Tamrin, head of Petronas Marine, said.

Ideal location

Located at the intersection of maritime trade route between

Australia and Asia, Sandakan Port is expected to develop as a strategic hub for LNG fuelling, according to Petronas.

Tamrin predicts that demand growth from manufacturing industries in Japan, South Korea and China will make it ‘an ideal location’ for Petronas to provide LNG bunkering going forward. He adds that this aligns closely with the group’s efforts to drive greater use of LNG as a cleaner and economically competitive source of energy in the marine industry.

“It also further solidifies PETRONAS Marine’s presence as a one-stop marine solutions partner providing cost-competitive cleaner fuels and reliable services to meet the energy demands of its cus-



Petronas-chartered *Avenir-Advantage*

tomers sustainably,” Tamarin states.

Collaborative effort

Headquartered in Kuala Lumpur, Petronas is one of the largest state-owned firms in Malaysia and ranked among the largest corporations in the world. The firm employs around 50,000 staff globally with a wide range of assets across the energy sector.

The *Avenir Advantage* is the

firm’s first dedicated LNG bunker vessel and is designed to serve customers in Sabah and mainland Malaysia. The ship features capacity for 7,500 cubic metres of LNG.

Bunkering at Sandakan was an internal collaborative effort between Petronas Marine and sister subsidiaries Petronas Energy & Gas Trading and Petronas Dagangan as well as terminal operator Sabah Ports. ■

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Consortium plans Turkish LNG bunkering hub

A consortium of maritime and energy firms in Turkey has announced plans to develop a major new LNG bunkering hub in the country.

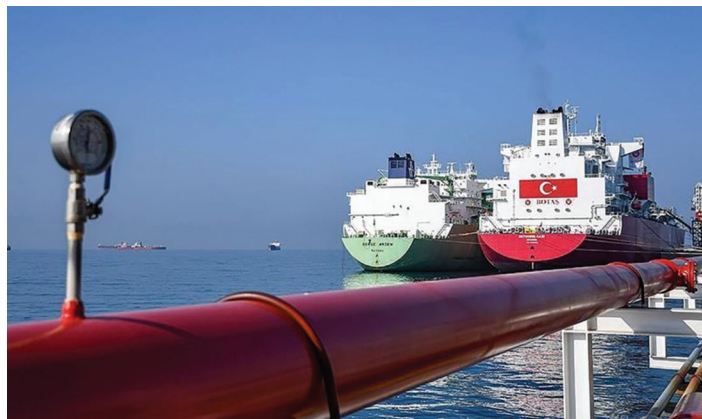
The tri-party agreement between Turkish energy group Botaş, maritime transport specialist Arkas and Japanese trading group Sumitomo, will see the firms cooperate to develop and build new LNG infrastructure in Turkey.

"We have already started to make preparations for the supply of LNG as bunker fuel in Turkey. Thanks to this tri-party agreement, Turkey will become a bunkering hub for LNG supply in the Eastern Mediterranean," Seckin Gul, general manager of Arkas Bunkering, said.

Eastern Med LNG hub

Highlighting the important role that they foresee for LNG in the fight against climate change, the partners outlined plans to transform Turkey into the LNG fuel supply centre of the Eastern Mediterranean.

"Botaş is one of the biggest players in the global energy market," Burhan ÖZCAN, General Manager at Botaş commented "LNG Bunkering service is a first for our country and the establish-



Botaş vessel

ment of the LNG Fuel Supply Center is a happy new step for BOTAŞ and our country."

Botaş operates 23,000 kilometres of national and international oil and gas pipelines, as well as the Silivri and Tuz Lake Natural Gas Underground Storage Facilities in Turkey and two gasification units including Dört Yol FSRU, Marmara Ereğlisi LNG Gasification Plant.

Carbon neutrality goal

Arkas will participate in the joint venture via its subsidiary Arkas Bunkering, which aims to build on

the firms well-established brand and existing fleet in the country to drive uptake for LNG.

Gul predicts that new sustainable policies will help accelerate demand in the country as fuel choice becomes an increasingly "important issue in terms of adding value to our country and our customers".

Yukio Kanazawa, Vice Chairman of Sumitomo Corporation Turkey, called the initiative an important part of the firm's aim "to be carbon neutral on an enterprise scale by 2050". Sumitomo has already

NEWS NUDGES

Snam, Eni open Aversa gas station

Sustainable mobility firm Snam has partnered with energy group Eni to open a new natural gas and biomethane filling station in Aversa, Caserta, Italy.

The facility was developed by Snam4Mobility and Eni and joins sister facilities in Trentino-Alto Adige, Piedmont, Veneto, Emilia Romagna and Puglia.

Eni currently operates a network of 104 CNG stations in Italy, with plans to increase this to 120 by the end of 2022, and to begin distributing only biomethane from next year. ■

made significant investments in LNG refuelling projects in Asia and North America and Kanazawa praised the "strong and experienced Turkish partners" in the project. ■



Botaş Marmara Ereğlisi LNG Terminal



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Imperial expands with Iveco BioLNG trucks

South African transport firm Imperial Logistics has expanded its UK fleet, with 18 new bioLNG-fuelled trucks from Italian manufacturer Iveco.

The deal will see Imperial add 18 Iveco Stralis Natural Power trucks to its satellite transport office in Cowley, Oxfordshire. The new additions will serve operations on the Unipart campus at the MINI Plant Oxford, on behalf of client BMW Group.

Mark Miles, managing director of Imperial UK explained that the order came about as a result of BMW's wider efforts to improve sustainability environment and Imperial's own commitment to the environment. "We consider it our duty as a responsible and caring member of the global business community to adopt environmental best practice whenever possible in the course of our daily activity; and so the opportunity to reduce our UK haulage operation's environmental impact was compelling. We're delighted to be working with our customers as part of a joint effort to improve sustainability in logistics, reconciling business efficiency with

environmental protection."

On-site training

The trucks will operate 24 hours a day, with multiple shift drivers, and Imperial has implemented an extensive training scheme in advance of delivery. Delivered on-site by Roadgas personnel, the scheme will ensure that all site staff and drivers are fully prepared to safely operate the gas refuelling equipment.

Roadgas also assisted with development of a temporary fuelling solution at the Cowley site, while a longer-term bio-LNG refuelling facility was constructed.

Becky Rix, Marketing Director for Roadgas, explained that the timings to deliver the temporary station were "very tight", adding "the resourceful collaborative planning with the Imperial team, together with the successful implementation of driver training and the install of this bespoke Bio-LNG refuelling station has been a



Iveco Stralis trucks

great start for the team in 2021 after what has been a really tough year."

Stralis NP 460

All 18 vehicles are AS440S46TX/P LNG IVECO Stralis NP 460 models and over the course of their collective lifetimes are forecast to cover around 3.3 million kilometres per year, cutting CO2 emissions by over 3,000 tonnes.

"IVECO NP heavy trucks are unique in the marketplace for being the only factory-built 6x2 tractors to run solely on natural gas," a spokesperson for the firm said. "The 12.9-litre CURSOR 13

offers a diesel-equivalent 460hp and 2,000Nm of torque across a wide power band and [features] a 12-speed HI-TRONIX automated gearbox with predictive mapping."

Gareth Lumsdaine, Iveco UK Heavy Business-line Director, commented: "It's great to see that IVECO Natural Power trucks are having a powerful impact beyond their own road-haulage work. Not only are our products allowing transport operators to significantly reduce their own environmental impact but are allowing partnerships with pioneering businesses to make a meaningful green change back down the line."

SGIG to add Parma LNG station

Italian gas station developer SGIG is to add a new LNG fuelling facility near Parma in the north of Italy.

LNG fuelling capabilities will be added by Dutch firm Liqal at the Socogas San Michele Campagna site, operated by energy firm Eni, near the Fidenza exit of the A1 motorway.

"The Italian market for LNG as transportation fuel is no longer in its infancy and suppliers are looking for high tech and reliable LNG fuelling solutions that provide a consistent fuel experience for end users at the highest quality," Joost Jansen, Business Development Manager at LIQAL. "We are excited to take our first step into the Italian market with our local partner SGIG."

Reliable LNG technology

The LNG system will be delivered on a turnkey basis and will include a 60 cubic metre LNG storage

tank, providing fuel to two LNG dispensers and a CNG dispenser with two-sided fuelling.

Fabio Scaramuzza, Director at SGIG said "We were looking for a company to deliver reliable LNG technology for seamless integration with existing fuel stations. That's where LIQAL came in. Working together we can deliver

integrated dependable technology to fulfil our customer's needs."

Once fully installed and tested, the site will be the 16th LNG fuel stations operated by SGIG in Italy.

The partners expect the new site to strengthen the offering for LNG vehicles en route between Milan and Bologna and highlight an accelerating trend towards

cheaper lower impact fuel.

"Decentralised production of Bio-LNG from local organic waste will help to cut costs," Joost Jansen says, "LIQAL provides a real-time LNG deliveries dashboard feature for efficient planning of LNG logistics to stations which will also contribute".

More than 3,000 LNG vehicles are already registered in Italy and Patrizia Zucchi, CEO of the Socogas Group predicts that this number is set to rise sharply. "Our new fuelling facility needed to comply with the highest standards in terms of quality and safety given that we expect to a yearly throughput of more than 2,000 tons of LNG. The LIQAL system allows efficient operation and fast and consistent fuel supply to the vehicles".



SGIG fuelling station



Power Play AWARDS

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Congratulations to the 2021 Power Play Award Winners!

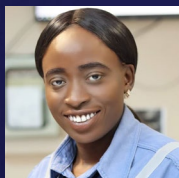
At ExxonMobil LNG, we salute the winners of the 2021 Power Play Awards. With the third annual Power Play Awards, we continued to celebrate the achievements of remarkable professionals in the LNG industry from around the globe.

This year, the Power Play Awards celebrated professionals in four categories: The Rising Star, The Ambassador, The Pioneer and the Conqueror. The four winners exemplified and exceeded all the characteristics sought after for their respective award categories.

The 2021 Power Play Awards winners are:

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Dr. Tolulope Ijirona

Instrumentation Engineer at Nigeria LNG Limited, Nigeria

THE AMBASSADOR

Given to a professional who displays positive energy and collaborative leadership while inspiring those around them

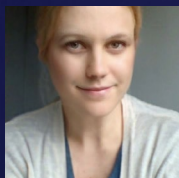


Candace Jimerson

Senior Director of Commercial LNG Operations at Golden Pass LNG, United States

THE PIONEER

Awarded to a professional who has delivered outstanding business results or innovation and technology leadership



Sandra Antonovic

Chief Operating Officer at Reflex Marine Ltd, United Kingdom

THE CONQUEROR

Recognized a female professional who has overcome challenges in the workplace, particularly in light of the 2020 pandemic



Hilary Ware

Senior Vice President, Chief Human Resources Officer at Cheniere, United States

Congratulations to these four deserving Power Play Award winners and to everyone nominated in this year's event! Each of your stories was impressive and inspiring.

Learn more about the Power Play Awards at [exxonmobilng.com/Power-Play/Power-Play-Awards](https://www.exxonmobilng.com/Power-Play/Power-Play-Awards)

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ExxonMobil | LNG

Tote completes renewable LNG bunkering first

Fuelling specialist Tote Maritime has completed the first bunkering of a marine vessel with ‘renewable’ LNG in the US, at the JAX LNG facility in Jacksonville.

The refuelling operation was completed between the firm’s bunker barge *Clean Jacksonville* and the LNG-powered container ship *Isla Bella*, with a mixture of traditional LNG and renewable LNG transferred.

The introduction of blended LNG is forecast to become increasingly popular, and Mike Noone, President of TOTE Maritime Puerto Rico, predicted that the fuel will play an important part in the ‘clean fuel revolution’ as JAX LNG continues to solidify its position as the industry leader.

“We’re proud to partner with JAX LNG, which has continued to solidify its position as the industry leader in the clean fuel revolution,” said Mike Noone, President of TOTE Maritime Puerto Rico. “RNG is a clean, drop-in fuel source that can be readily deployed for use today, since it needs no new equipment to capture or transport it,” Noone commented.

Renewable thermal certificates

The RLNG used for this bunkering was produced from renewable natural gas supplied by asset management and biogas firm Element

Markets. Produced from the decomposition of organic waste, the RNG was not only compatible with existing natural gas infrastructure, but was also accompanied by renewable thermal certificates (RTCs), adding regulatory incentives for the operators.

Angela Schwarz, CEO of Element Markets “RNG offers highly flexible pathways to reducing transportation emissions. We are glad to be part of these forward-thinking initiatives to decarbonize large-scale logistics operations,” said.

The use of tax breaks, such as the alternative fuel tax credit, has helped many firms to adjust operations and make investments in assets that reduce carbon intensity and Tote predicts this latest milestone will help to further accelerate decarbonization of the transport sector.

Noone of Tote explains that “the RTCs were matched to the physical LNG” loaded into the *Clean Jacksonville* to create a unique RLNG/LNG blended product, helping to mitigate and repurpose carbon emissions.

Beneficial fuel source

Roger Williams, VP Commercial



The *Clean Jacksonville* bunkering fuel

LNG and Gas Development at BHE GT&S, the parent company of Pivotal LNG, which holds 50% ownership of JAX LNG, believes that the ability of RLNG blends to help customers reduce their environmental footprint will be a major factor going forward, calling the latest bunker operation “an example of what is possible” in the realm of renewable natural gas and citing plans to expand on this success.

JAX LNG has signed long-term supply agreements for two LNG-fueled container vessels — the *Isla Bella* and the *Perla del Caribe* — that TOTE Maritime Puerto Rico utilizes to reliably transport goods between Jacksonville and Puerto

Rico.

“Providing our customers an environmentally beneficial fuel source is JAX LNG’s goal,” said Tim Casey, SVP of NorthStar Midstream, which shares 50% ownership of JAX LNG. “Supplying LNG sourced from RNG further supports our commitment to aid the shipping industry’s transition to a net-zero emissions future.”

Headquartered in Florida, TOTE Group is an owner/operator of shipping services across the US and Caribbean. The firm has been at the forefront of LNG development since 2015, ordering some of the world’s first LNG-powered container ships.



The *Clean Jacksonville* in the Vistal Channel



PETRONAS

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We aim to enable businesses to take full advantage of the benefits of natural gas – the cleaner, more versatile and capable fuel. From research and development, to exploration, to building infrastructure and

more, we specialise in laying the groundwork to ensure natural gas becomes a core part of their energy mix.

Additionally, we also offer a range of customisable, end-to-end LNG delivery solutions that strive to provide more value. This includes supplying customers located far away from main pipelines with a reliable supply of LNG via trucks, breaking LNG cargoes into smaller parcels to transfer it more efficiently between seagoing ships and other specialised services such as Gas Up Cool Down (GUCD) which involves cooling down natural gas for improved LNG carrier loading and storage.

In line with our purpose to be a progressive energy and solutions partner enriching lives for a sustainable future, PETRONAS' ambition is to achieve net zero carbon emissions by 2050. In addition to natural gas, we also offer renewable and net zero carbon energy solutions such as solar, wind and hydrogen. By providing businesses with reliable access to better and more sustainable energy solutions, we enable them to reduce their carbon footprint and create long-term value for societies and the planet.

For businesses looking to progress in these modern times, having the right energy is crucial. Natural gas is the cleaner and more efficient fuel – making it the ideal choice for business operations. But equally important is having an energy solutions partner that is willing to go the extra mile in supporting your business achieve what it seeks – and that is where PETRONAS LNG comes in.

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Dover completes Liqal acquisition

Fuel specialist Dover Group has completed the acquisition of Dutch LNG equipment maker Liqal, as it targets sustained growth in the LNG and hydrogen fuelling sectors.

The firm announced that Liqal will now form part of its Dover Fueling Solutions (DFS) operating unit and continue to develop safe, efficient, and innovative alternative fuel solutions.

“Adoption of alternative fuels for transportation is expected to grow and new fuelling infrastructure projects increasingly require site digitalization and integration of various technologies. LIQAL’s turnkey and digital capabilities fit well with customer requirements and allowed us to become a leader in this growing segment,” Jorg Raven, founder and managing director of LIQAL, said.

Exceptional track record

Founded in the Netherlands in 2014, Liqal has built a reputation developing LNG equipment and solutions for road-base transport across Europe and David Crouse, president of DFS hailed the firm’s ‘exceptional track record’ and

‘high-quality standards’.

“DFS is a global leader in solutions for retail fuelling and a recognized technology pioneer. LIQAL brings a portfolio of LNG and hydrogen products and solutions, as well as significant innovation capabilities and proprietary technologies that will position DFS to support its customers who are actively investing in lower-carbon fuels,” Crouse commented.

In 2017, Liqal signed a partnership with Technical Services Group (TSG), a subsidiary of Dover Group, for the design, engineering, production and delivery of complete fuelling installations for LNG and hydrogen.

Cloud-based monitoring and control

Development of Liqal technology will continue within DFS’ fuelling segment, targeting LNG and hydrogen fuelling opportunities, which Raven expects to continue



Liqal LNG dispenser

growing in the coming years, adding “we are excited to join forces with DFS to bring to market our unique cloud-based monitoring and control system solutions tailored specifically for these alternative fuelling applications.”

Headquartered in Austin, Texas, Dover Group employs 2,800 staff worldwide and works more than 950 channel partners in over 150 countries. The group’s brands include product brands of ClearView, Fairbanks, OPW Fuel Management Systems, ProGauge, Tokheim and Wayne Fueling Sys-

tems and it operates facilities in Brazil, China, India, Italy, Poland, the United Kingdom and the US.

“With the acquisition of LIQAL, and our strategic partnerships with EV charging providers, DFS is well-positioned to help our customers adopt these prevailing alternative fuel options, which enhances our position as a preferred partner offering simple, safe and efficient end-to-end site experiences for consumers, as well as the convenience retail and fleet industries,” Crouse concluded.



Liqal fuelling station

NEWS NUDGES

Fluxys, Novatek cancel Rostock LNG plans

Belgian gas transmission system operator Fluxys and Russian gas producer Novatek have cancelled plans to create an LNG transshipment terminal and bunkering hub in Germany.

The proposed facility was to have handled a capacity of approximately 300,000 tonnes per year but the firms cited ‘current market conditions’ as a driving

factor in the cancellation of the project.

“Fluxys and Novatek have regretfully decided to discontinue their joint project to build and operate a mid-scale LNG terminal in the port of Rostock. Despite constructive support from all project stakeholders, current market conditions proved to be too challenging to pursue the project,” a Fluxys spokesperson, said.

Hapag-Lloyd delays LNG retrofit plans

RoRo shipping line Hapag-Lloyd has reportedly postponed plans to

retrofit its fleet to run on LNG, citing the need to monitor ongoing operations of its first refitted vessel - the *Brussels Express*.

This 15,000 TEU containership made its maiden voyage on LNG earlier this year, and fully bunkered with the fuel for the first time in Singapore. Originally named the *Sajir*, the ship was retrofitted with a 1,300-tonne LNG tank at the Huarun Dadong Dockyard in Shanghai.

“The fact that a retrofitting of this scale had never been done before meant that we faced numerous challenges - from the

planning to the implementation. We have broken new ground with the conversion, and we will now be testing it very precisely in real-world operation,” Richard von Berlepsch, Managing Director Fleet Management at Hapag-Lloyd said at the time.

In the long term the company aims to switch from fossil-derived LNG to synthetic natural gas (SNG) derived from renewable sources, however in the short term any plans to refit more vessels have been put on hold as the firm ‘evaluates performance’ and decides how to proceed.

Redexis, Cepsa open Madrid refuelling station

Spanish gas firms Redexis and Compañía Española de Petróleos (Cepsa) have inaugurated a new refuelling station in Madrid.

The facility, located in Getafe to the south of the Spanish capital, will supply both LNG for heavy-duty vehicles and CNG for light transport.

"We are continuing to advance in the development of the largest gas mobility network in Spain with the implementation of gas stations in strategic locations for the mobility of our country," Santiago Ruiz, director of the Cepsa Service Station Network, said.

Headquartered in Madrid, Cepsa is a multinational oil and gas company with operations across Europe, Algeria, Canada, Colombia, Morocco, Brazil, and Panama. The company operates a network of more than 1500 service stations in Spain and has a refining capacity of 21 million tonnes/year.

Largest network

The facility is the fifth refuelling station opened by the partners and is part of plans to create the

largest network of LNG and CNG refuelling stations in Spain. Redexis invested over one million euros to build the facility and expects more to follow imminently.

Javier Migoya, B2B director of Redexis, commented: "We continue to bet on the creation of the largest network of gas stations in Spain, building and developing the necessary infrastructures to promote alternative fuels in our country that promote a more sustainable, economical and environmentally friendly mobility."

Also based in Madrid, Redexis provides integrated gas distribution services across Spain, with 733,174 connection points and 11,715 kilometres of pipeline infrastructure across ten autonomous communities. As part of the partnership agreement, Redexis has committed to invest 60 million euros by 2023 to build and maintain 80 gas stations located in Cepsa Service Stations.

Biofuel in Zaragoza

Expanding its footprint in the northeast of the country, Redexis announced the start of operations at a new biomethane refuelling station in Zaragoza in September.

Providing fuel for Zaragoza Transport Consortium, the new station will supply a fleet of Scania buses with biomethane from livestock slurry, waste from water

treatment plants and other municipal services that will allow the production of carbon-neutral fuel.

"This gas station is connected to the Redexis gas pipeline network, thus ensuring the renewable origin of biomethane through guarantees or certificates of origin of renewable gas, thus achieving a neutral mobility in CO2 emissions," a spokesperson for the firm said. ■



Cepsa LNG filling station

Petronas reports LNG bunker growth

Malaysian energy firm Petronas has reported a strong increase in LNG bunkering activity in the first half of 2021 as its Virtual Pipeline System (VPS) deliveries grew.

The firm reported nine LNG Bunkering deliveries in the Straits of Malacca over the period, including its first LNG bunkering operation in Port Klang, with further shipment completed in Peninsular Malaysia via VPS.

"Petronas continues to provide reliable supply of LNG to off-grid and marine industry customers with a total of 180 VPS deliveries

completed in Peninsular Malaysia," a spokesperson for the firm said.

First half growth

The results were published as part of first half financial disclosures which pointed to growing momentum in the midstream and downstream segments for the firm. Gas sales were higher in the first half, compared to the same period last

year, mainly due to higher demand from the power sector as the firm secured up to 619.7 million cubic feet per day of natural gas supply deals.

"Amidst an uncertain outlook, the Group remains steadfast in delivering cost-effective solutions with a lower carbon footprint by advancing its technology and digitalisation agenda. PETRONAS will continue to progress its three-pronged growth strategy at pace and intensify its sustainability efforts to secure new opportunities in the energy transition," Tengku Muhammad Taufik, CEO of Petronas, said.

Profit After Tax rose more than 100 per cent in the first half to RM18.9 billion, up compared to a Loss After Tax of RM16.5 billion in the same period last year.

Export hub

The firm also strengthened Malaysia's position as an LNG ISO tank export hub in the first half, thanks to the start-up of its new ISO tank facility in Pengerang earlier in the year, complementing existing operations in Bintulu, Sarawak.

Over the first six months, the firm secured LNG sales of 3.17 million tonnes per annum and delivered over 11,790 LNG cargoes from its LNG Complex in Bintulu, marking almost four decades since operations began there in 1983.

Headquartered in Kuala Lumpur, Petronas is one of the largest state-owned firms in Malaysia and ranked among the largest corporations in the world. The firm employs around 50,000 staff globally with a wide range of assets across the energy sector. ■



Petronas virtual LNG pipeline tanker

A worker wearing a white hard hat with the Atlas Copco logo and safety glasses is focused on a task. He is working on a large, complex industrial machine, possibly a compressor or expander, which has a large circular component with a serrated edge. The background is slightly blurred, showing an industrial setting.The Atlas Copco logo, consisting of the company name in a stylized, italicized font, is positioned within a blue rectangular box with white horizontal lines above and below the text.

Atlas Copco

A technical drawing of a circular industrial component, likely a compressor or expander, is overlaid on a blue triangular graphic. The drawing shows various dimensions and internal structures, including a central circular area with radial lines and a surrounding ring with multiple holes. The blue triangle also contains other technical details and dimensions, such as '1380', '1630', '1740', '1800', '1900', '2000', '2100', '2200', '2300', '2400', '2500', '2600', '2700', '2800', '2900', '3000', '3100', '3200', '3300', '3400', '3500', '3600', '3700', '3800', '3900', '4000', '4100', '4200', '4300', '4400', '4500', '4600', '4700', '4800', '4900', '5000', '5100', '5200', '5300', '5400', '5500', '5600', '5700', '5800', '5900', '6000', '6100', '6200', '6300', '6400', '6500', '6600', '6700', '6800', '6900', '7000', '7100', '7200', '7300', '7400', '7500', '7600', '7700', '7800', '7900', '8000', '8100', '8200', '8300', '8400', '8500', '8600', '8700', '8800', '8900', '9000', '9100', '9200', '9300', '9400', '9500', '9600', '9700', '9800', '9900', '10000'.

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Ponant inaugurates LNG-fuelled polar cruise ship

Tour operator Ponant has completed the first LNG bunkering of a cruise ship in France.

The firm carried out refuelling operations for its new high polar exploration vessel, *Le Commandant Charcot*, in Le Havre in the North of France.

“The boldness of this project is not just about taking passengers to the far corners of the Arctic and the Antarctic, it is about doing it safely and following the same values and principles of seamanship that move us,” Hervé Gastinel, CEO of Ponant, commented.

Polar Class 2-rated

The vessel has been classified as a Polar Class 2-rated icebreaking vessel, capable of reaching remote polar destinations, and is powered by a hybrid power plant running on LNG and electric batteries.

“Our values are first about respect for nature - this nature that is so dear to us, all the more knowing how much we owe the oceans and the fragile eco-systems we travel. Polar regions in particular deserve the highest respect and attention. We are committed to this mission every day and today ever more,” Gastinel said.

Measuring 150 metres in length, the vessel is powered by four Wärtsilä 14V31DF and two

Wärtsilä 10V31DF engines. Built in Romania, the vessel launched early last year and completed its first test trip through the Arctic in June this year.

Onboard research facilities

The luxury cruise ship features an indoor swimming pool, conservatory, and multiples restaurants and has capacity for 245 guests and 235 crew members. Onboard science facilities will also allow staff to conduct research, providing a platform for observation, research and analysis to study the polar eco-systems.

“*Le Commandant Charcot*, was designed with the highest atten-

tion in mind in terms of safety, comfort and respect for the environment in order to sail and explore the extreme and far-reached territories of the Arctic and the Antarctic, in complete self-sufficiency,” a spokesperson for Ponant said.

Headquartered in Marseille, France, Compagnie du Ponant (CDP) is a niche French cruise ship operator, with a fleet of eleven ships. To celebrate the vessels arrival in France, Ponant held a launch ceremony attended by Anne Manipoud-Charcot, the great-grand-daughter of the famed French polar explorer Jean-Baptiste Charcot after which the ship is named.



Le Commandant Charcot

NEWS NUDGES

GAC appoints Lindquist Head of LNG Bunkering

Fuel supplier GAC has appointed John Lindquist as its new Head of LNG Bunkering.

Based in Houston, Lindquist moves from his previous role at the company as Commercial Manager - LNG Services. He will oversee the firm's expansion of LNG bunkering, following its role supplying the first non-US flagged vessel to bunker LNG in the US last year.



Launch ceremony for *Le Commandant Charcot*

LNG Marine secures AiP for LNG bunker vessel design

Standards agency Bureau Veritas has approved plans for the first LNG bunkering vessel designed in Malaysia.

The agency issued Approval in Principle (AiP) to Malaysian naval firm LNG Marine for a new breed of bunker vessel that will incorporate battery power alongside gas fuel.

Captain Ahmad Sufian Abdul Rashid, chairman of LNG Marine, foresees demand for LNG as fuel in the Southeast Asia Region increasing in line with IMO's sustainability agenda "and the industry's wider push" towards net zero carbon.

"Malaysia is a significant LNG

bunkering hub, with over 100,000 vessels passing through the Malacca Strait each year. Moreover, the availability of two re-gasification terminals and one FSU along the shores of Malaysia will provide steady supply. The decision by LNG MARINE to get its conceptual design approved in principle is further reinforced by the fact that local shipping companies are keen to be part of the LNG bunkering cycle," Rashid comments.

Malaysian bunkering fleet

Established in 2020, LNG Marine develops marine solutions linking the maritime, gas, power and energy industry. The firm plans to design, own, build, operate and maintain a fleet of specialized vessels for LNG bunkering.

Last year, Malaysian national energy major Petronas announced the completion of its first LNG bunkering operation in the country, refuelling the *Avenir Advantage* at Pasir Gudang, Johor.

Petronas has since extended its Virtual Pipeline System across much of the country, boosting availability of LNG for bunkering and helping to connect off-grid customers.

Security and environmental notation

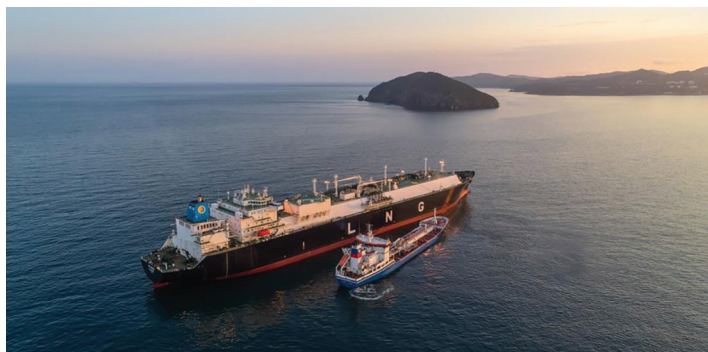
David Barrow, Vice President for South Asia at Bureau Veritas Marine & Offshore, explained that

the firm worked closely LNG Marine to understand and address the challenges of LNG bunkering.

"Our unique position across the whole LNG value chain has allowed us to actively participate in and support the latest developments of LNG bunker vessel. It is an honour to support LNG Marine in the first new-build LNG bunker vessel concept in Malaysia," Barrow commented.

The new design incorporates Cyber Managed notation and as well as Cleanship notation and Green Passport notation to ensure compliance with future regulation and auditing.

Headquartered in Paris, Bureau Veritas provides testing, inspection and certification services worldwide. The company operates 1,400 offices in 140 countries and quality, health and safety guidance for both new and existing asset classes.



LNG bunker vessel

Bureau Veritas approve "NH3 Ready" tanks

Classification society Bureau Veritas has approved designs by engineering group Gaz-transport & Technigaz (GTT) for its first "NH3 Ready" Mark III LNG fuel tanks.

The design received Approval in Principle (AiP), indicating that the firm's that Mark III technology was suitable for the containment of ammonia as a fuel, without major design changes compared with LNG fuel tanks.

"Today, GTT is delighted to propose the only "real" NH3 Ready notation for any type of LNG fuelled vessel," a spokesperson for the firm said, adding that this design will keep "the door open to carbon neutral LNG with bio-LNG and synthetic LNG later with no cost of conversion".

Medium-term solution

The AiP covers chemical compatibility of Mark III stainless steel primary barrier with ammonia as well as potential design adaptations of the containment system and the supporting hull structure, in order

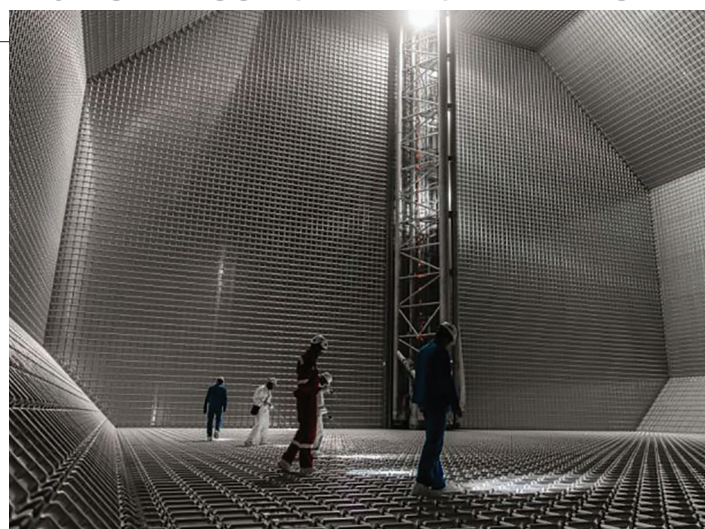
to sustain the higher sloshing loads of liquid ammonia.

Although no commercial projects have so far been announced to take advantage of this design, GTT is discussing similar approvals with the other classification societies to provide the best reactivity should a ship owner request the notation.

"Although GTT is convinced that the LNG is the solution of choice to reduce ship emissions, widely available now, ammonia is considered as a credible alternative fuel in the medium term to enable further decarbonisation," a spokesperson for the firm said.

New guidelines

While the "NH3 Ready" tank will not require major changes to accept ammonia fuel, the granting of an NH3 Ready notation for a



GTT containment tank

finished system may require an alternative design process since ammonia is not yet part of the IGF code.

"Interestingly, all major classification societies are currently working on their guidelines for NH3 as a fuel, in order to ease the

process," GTT states.

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

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Repsol progresses Bilbao LNG terminal

Spanish gas specialist Repsol has started construction on its delayed LNG bunker terminal in the north of Spain.

The terminal at the port of Bilbao will feature a cryogenic tank with capacity to store 1,000 cubic metres of fuel and is scheduled to be commissioned in the first half of next year.

“The construction of this terminal is part of the long-term collaboration agreement signed in 2019 between Repsol and Brittany Ferries for the supply of LNG to their operations in Spain,” a spokesperson for the port authority explained.

Repsol will use the LNG bunkering terminal to service to two Brittany Ferries vessels - the *Salamanca* and the *Santoña* - due to come into service in 2022 and 2023 respectively.

Connecting Europe facilities

The project will involve investment of over €10 million, co-funded by the European Commission through the Connecting Europe Facilities Programme. It will be the seventh operational LNG reception and storage plant in the country when

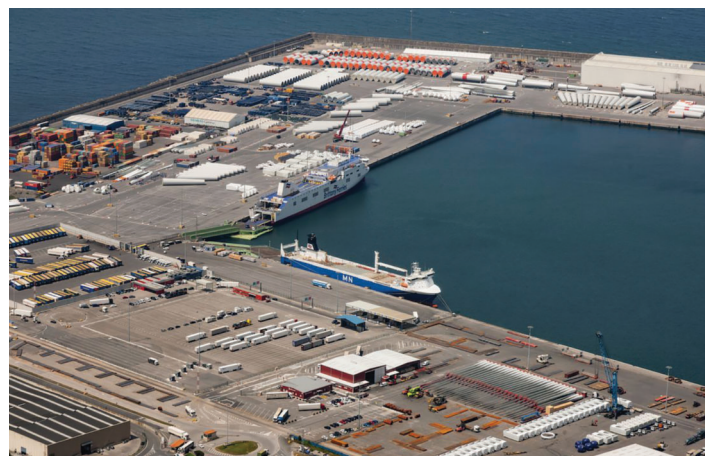
it launches next year.

“According to data from the Iberian Association of Natural Gas for Mobility (Gasnam), the number of LNG-powered ships worldwide currently stands at 221, a 70% increase compared to the 131 ships that were in operation in 2018,” the Bilbao Port’s spokesperson added.

The authority predicts that switching the Brittany Ferries’ lines between Bilbao and Santander will reduce annual CO₂ emissions by approximately 73,000 tonnes, equivalent to the annual emissions of more than 50,000 cars.

Alternative fuel infrastructures

Alongside the development of new LNG infrastructure, Repsol also recently announced progress elsewhere in its alternative fuel programme, producing renewable hydrogen from biomethane for the first time. The breakthrough was achieved at Repsol’s Cartagena Industrial Complex, where 10 tonnes of renewable hydrogen



Bilbao ferry terminal

were produced from 500 MWh of biomethane.

“The biomethane used as raw material was obtained from urban solid waste,” Repsol commented. “This first industrial tests carried out by Repsol will also serve as an example for developing the system of guarantees of origin for renewable gases to be implemented in Spain.”

Repsol is promoting the creation of large regional consortiums to promote major alternative fuel projects, such as the Basque Hy-

drogen Corridor, and the Spanish Ministry of Ecological Transition and the Demographic Challenge recently released a draft royal decree for public information.

Headquartered in Madrid, Repsol is a fully integrated energy and petrochemical’s firm and employs more than 24,000 employees worldwide. In September, the firm began operating its first electrolyzer and plans to expand production to serve synthetic fuels plant that the company will build together with Saudi Aramco. ■



Construction at Bilbao LNG bunker terminal

LNG BUNKER VESSELS

Vessel Name	Home Port	Project status	Delivery year	Country	LNG Tank Capacity	Owner	Operator
Yidu inland river LNG bunker barge	Yidu port	In operation	2014	China	500	Xilan Natural Gas Group	Xilan Natural Gas Group
FlexFueler 001	Amsterdam	In operation	2019	Netherlands	1480	Titan LNG	Titan LNG
FlexFueler 002	Antwerp	In operation	2021	Belgium	1480	Titan LNG	Titan LNG
Titan Hyperion	TBD	Decided	2021	Netherlands	8000	Titan LNG	Titan LNG
Titan Krios	Zeebrugge	Under discussion	2023	Belgium	4200	Titan LNG	Titan LNG
PRO1	Houston	Under discussion	Q42022	United States	7600	LNG PRO Bunkers	TBN (Probunkers group company)
PRO2	Hong Kong	Under discussion	Q12023	Hong Kong	7600	LNG PRO Bunkers	TBN (Probunkers group company)
Coralius	Risavika	In operation	2017	Norway	5600	Sirius Veder Gas	Sirius Rederi
Coral Methane	Rotterdam	In operation	2018	Netherlands	7551	Anthony Veder	Shell
Crowley/Shell LNG bunker barge	U.S. East Coast	In operation	2024	United States	Crowley Maritime Corporation	Shell	Shell
New Frontier1	Rotterdam	In operation	2017	The Netherlands	6500		Shell
SeaspanLNG bunker vessel	Vancouver	Under discussion	2023	Canada	7600	SeaspanLNG	SeaspanLNG
Petronas LNGBV		Under discussion	2024	Malaysia	13000	Petronas	Petronas
Peninsula/Enagas LNG bunker vessel	Port of Algeciras	Decided	2023	Gibraltar	12500	Peninsula/Enagas	Peninsula/Enagas
Green Zeebrugge	Zeebrugge	In operation	2017	Belgium	5200	NYK	NYK
Kairos	Lithuania	In operation	2018	Lithuania	7500	Bernhard Schulte	Nauticor
Naturgy LNG bunker vessel	Barcelona	Under discussion	2022	Spain	6000	Naturgy	Naturgy
Gas Agility	Northern Europe	In operation	2020	Netherlands	18600	Mitsui OSK Lines Ltd	Mitsui OSK Lines Ltd
Gas Vitality (Total / MOL)	Singapore (tbc)	Decided	Q4 2021	--	18600	MOL	Mitsui OSK Lines Ltd. (MOL) & Gazocean
SM JEJU LNG2	Busan	In operation	2020	South Korea	7500	Korea Line	Korea Line
Korea Gas (KOGAS) LNG bunker vessel		Decided	2023	South Korea	7500	KOGAS	KOGAS
Pioneer Knutsen		In operation	2020	Norway	1100	Knutsen OAS Shipping	Knutsen OAS Shipping
LNG bunker barge shell	Barcelona	Decided	2022	Spain	5000	Scale Gas / Knutsen JV	Knutsen OAS Shipping
Q-LNG 4000	Port Canaveral, FL	In operation	2020	United States	4000	Q-LNG	Harvey Gulf International Marine
Q-LNG ATB Bunker Barge 8000	TBD	Under discussion	TBD	United States	8000	Q-LNG	Harvey Gulf International Marine
Dmitry Mendelev		In operation	Q3 2021	Europe	5800	Shturman Koshelev LLC	Gazpromneft Marine Bunker Ltd
FueLNG Bellina	Singapore	In operation	2020	Singapore	7500	FueLNG (JV Keppel & Shell)	FueLNG
Fratelli Cosulich Mediterranean Sea	Mediterranean Sea	Decided	2023	Italy	8000	Fratelli Cosulich	Fratelli Cosulich LNG
Clean Jacksonville	Jacksonville Jax LNG	In operation	2018	United States	2200	TOTE	FOSS Maritime
Xinao Putuo Hao	Zhoushan	Decided	2021	China	8500	ENN Energy	ENN Energy
Optimus		Decided	Q4 2021	Europe	6000	Eesti Gaas	Elenger
FUKUOKA FUKUOKA 1350	Yokohama	Decided	2021	Japan	2500	Ecobunker shipping	Ecobunker shipping
Kaguya	Chubu region (Central Japan)	In operation	2020	Japan	3500	CLS (JV established by K Line, JERA, NYK and Toyota Tsusho Corp.	CLMF (JV by CLS partners)
Oizmendi	Huelva	In operation	2018	Spain	600	Cepsa	Cepsa
Seagas	Stockholm (Louden)	In operation	2013	Sweden	187	Gasum	AGA
Avenir Accolade		In operation	2021	Brazil	7500	Avenir LNG	
Avenir Advantage		In operation	2020	Malaysia	7500	Avenir LNG	
Avenir Aspiration	Not yet decided (being built in China)	Decided	Aug 2021	China	7500	Avenir LNG	
Avenir bunker vessel 3	Oristano, Sardinia	Decided	2021	Europe	7500	Avenir LNG	
Avenir bunker vessel 5 (Location unknown)	Not yet decided (being built in China)	Decided	Jun 2021	China	20000	Avenir LNG	
Avenir bunker vessel 6 (Location unknown)	Not yet decided (being built in China)	Decided	Sep 2021	China	20000	Avenir LNG	
Bergen LNG	Bergen	In operation	2021	Norway	850	Bergen Tankers	

Vessel Name	Home Port	Project status	Delivery year	Country	LNG Tank Capacity	Owner	Operator
Bunker Breeze	Algeciras	In operation	2018	Spain	1200	Suardiaz Energy Shipping	
Clean Canaveral	Jacksonville, FL	Decided	2022	United States	5400	Polaris New Energy	
Coral Anthelia		In operation	2013	Jamaica	6500	Anthony Veder	
Coral EnergyICE	Risavika	In operation	2018	Europe	18000	Anthony Veder	
Coral Energy	Risavika	In operation	2013	Europe	15000	Anthony Veder	
Coral Favia		In operation	2010	Russia	10000	Anthony Veder	
Coral Fraseri	Unknown	In operation	2019	Global	10000	Anthony Veder	
Coral Fungia		In operation	2011	Russia	10000	Anthony Veder	
Coral Furcata		In operation	2011	--	10000	Anthony Veder	
Cryopeak LNG	Vancouver	Under discussion	2022/3	Canada	4000	Cryopeak	
DEPA Limassol	Limassol	Under discussion	2022	Greece	4000	DEPA	
DEPA Piraeus	Piraeus	Under discussion	2022	Greece	4000	DEPA	
Domestic LNG Bunkering Vessel in China	To be decided (China)	Under discussion	2021	China	6000	CNOOC	
Domestic LNG Bunkering Vessel in China	To be decided (China)	Under discussion	2021	China	12000	CNOOC	
FlexFueler 003	Zeebrugge	Under discussion	TBD	Belgium	1480	Titan LNG	
FlexFueler 004	Lubeck	Under discussion	TBD	Germany	1480	Titan LNG	
FSU and LNG Bunker Barge, Port of Coega, South Africa	Port of Coega	Decided	2022	South Africa	10000	DNG Energy	
Kanfer Shipping LNG bunker vessel 1	Not yet decided	Decided	2023	--	6000	Kanfer Shipping	
Kanfer Shipping LNG bunker vessel 2	Not yet decided	Decided	2023	--	6000	Kanfer Shipping	
LNG bunker barge GALP		Decided	2022	Portugal		GALP	
LNG bunker vessel Swinoujscie	Swinoujscie	Under discussion	2023	Poland		Polskie LNG	
LNG London	Rotterdam	In operation	2019	Netherlands	2998	LNG Shipping (Victrol & Sogestran)	
MOL LNG bunker vessel	Singapore	Decided	2021	Singapore	12000	Mitsui OSK Lines Ltd (MOL)	
Polaris ATB No. 2	Jacksonville, FL	Under discussion	TBD	United States		Polaris New Energy	
Port of Algeciras LNG-Bunkering Vessel	Port of Algeciras	Under discussion	2023	Spain	12500	Enagás	
Poseidon Med II bunkering barge	Revithoussa	Decided	2022	Europe	4000	Venture led by DEPA	
Shell LBV	Singapore (tbc)	Decided	2022	Singapore	18000	Korea Line LNG	
Shell LBV Gulf of Mexico	Gulf of Mexico	Decided	2023	United States	18000	Pan Ocean	
SM JEJU LNG1		In operation	2019	--	7500	Jeju LNG 1 SA	
Small LNG bunkering vessel in South Korea		Decided	2021	South Korea	500	Ministry of Oceans and Fisheries	
Woodside Western Australia LNG bunker vessel	Dampier	Under discussion	2023	Australia	12000		

MAP OF BUNKER VESSEL LOCATIONS



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	Tripura	23,096	LNG	Indonesia - Japan	Yes	MCGC
2003	Pioneer Knutsen	1,100	LNG	Norway	Yes	Knutsen
2003	Shinju Maru No.1	2,540	LNG	Japan	Yes	Shinwa
2005	North Pioneer	2,500	LNG	Japan	Yes	Japan Liquid Gas
2007	Sun Arrows	19,531	LNG	Malaysia - Russia - Japan	Yes	Mitsui
2008	Kakurei Maru	2,536	LNG	Japan	Yes	Hogaki Zosen
2008	Shinju Maru No.2	2,540	LNG	Japan	Yes	Shinwa
2009	Coral Methane	7,551	LNG/LPG/Ethylene	Northwest Europe/Baltics	Yes, sometimes	Anthony Veder
2010	Coral Favia	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2010	Coral Fraseri	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Coral Furcata	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Coral Fungia	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
2011	Vision Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2011	Unikum Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2012	Coral Energy	15,600	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2013	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2015	JS Ineos Ingenuity	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Insight	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Intrepid	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	PetroChina TBN	30,000	LNG	China		PetroChina
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Innvation	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

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Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
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	SM Jeju LNG1	7,500	LNG	Korea	Yes	Korea Line
2019	Gas Agility	18,600	LNG	NWE	Yes	MOL
2019	Flexfueller 001	1,480	LNG	Amsterdam	Yes	Titan LNG
2020	Avenir Advantage	7,500	LNG	Mediterranean	Yes	Avenir LNG
2020	Avenir Accolade	7,500	LNG	Mediterranean	Yes	Avenir LNG
2020	Avenir Aspiration	7,500	LNG		Yes	Avenir LNG
2020	Kaguya	3,500	LNG	Japan	Yes	CLS
2020	CNTIC VPOWER Global	28,000	LNG	Myanmar	Yes	Dalian Inteh Group
2020	Ecobunker Tokyo Bay	2,500	LMG	Japan	Yes	Ecobunkers
2020	Optimus	6,000	LNG	NWE	Yes	Elenger
2020	ENN TBN	8,500	LNG	China	Yes	ENN
2020	FueLNG Bellina	7,500	LNG	Singapore	Yes	FueLNG
2020	SM Jeju LNG2	7,500	LNG	Korea	Yes	Korea Line
2020	Q-LNG 4000	4,000	LNG	US Coast	Yes	Q-LNG Transport/Harvey Gulf
2020	Flexfueller 002	1,480	LNG	Antwerp	Yes	Titan LNG
2021	Avenir Ascension	7,500	LNG		Yes	Avenir LNG
2021	Avenir Allegiance	20,000	LNG	Worldwide	Yes	Avenir LNG
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	PE TBN	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	Veder TBN	30,000	LNG	Worldwide	Yes	Anthony Veder
2022	Avenir Achievement	20,000	LNG	Worldwide	Yes	Avenir LNG
2022	Kuntsen TBN	5,000	LNG	Spain	Yes	Knutsen OAS
2022	Clean Cañaveral	5,400	LNG	USG	Yes	PNE
2023	Cryopeak TBA	4,000	LNG	West Canada	Yes	Cryopeak
2023	Kuntsen TBN	12,500	LNG	Spain	Yes	Knutsen OAS
2023	SM Jeju LNG3	7,500	LNG	Korea	Yes	Korea Line
2023	Pan Ocean TBN	18,000	LNG	USG	Yes	Pan Ocean Co
2023	Krios	4,200	LNG	Benelux	Yes	Titan LNG
2023	Fratelli Cosulich TBN	8,000	LNG	Mediterranean	Yes	Fratelli Cosulich
2023	Kanfer TBN	6,000	LNG	Worldwide	Yes	Kanfer Shipping
2023	Kanfer TBN	6,000	LNG	Worldwide	Yes	Kanfer Shipping
2023	K Line TBN	18,000	LNG	Korea	Yes	K Line
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2024	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2024	TBN	30,000	LNG	Australia	Yes	Anthony Veder ?
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG
2026	Avenir TBN (option)	20,000	LNG	Worldwide	Yes	Avenir LNG

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