

LNG Fuelling

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Total, MOL inaugurate world's largest LNG bunker vessel

Energy major Total and shipping firm Mitsui O.S.K. Lines (MOL) have inaugurated the world's largest LNG bunker vessel, the *Gas Agility*.

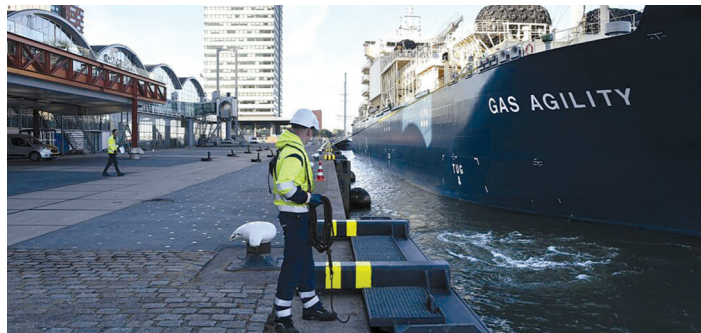
The giant refuelling ship began operations this month with a record ship-to-ship transfer when it bunkered the world's largest LNG container ship the *Jacques Saade* at the Port of Rotterdam. Fuel was supplied by Total Marine Fuels Global Solutions (TMFGS) and included a blend of bioLNG.

"We are really proud of this landmark achievement... It marks the shipping industry's first commercial use of biomethane on this scale. Such introduction reflects Total's ambition to get to Net Zero by 2050," Jérôme Leprince-Ringuet, Managing Director of TMFGS, said.

The *Gas Agility* is owned by Emerald Green Maritime, a wholly owned subsidiary of MOL and is chartered by TMFGS.

GTT Mark III Flex membrane

The pioneering vessel features an 18,600-cubic-metre capacity GTT Mark III Flex membrane storage system and integrates complete



Gas Agility at dock in Rotterdam

re-liquefaction of the boil-off gas.

"*Gas Agility* is a clear demonstration of our ongoing drive to develop key logistical LNG infrastructures in the main bunkering hubs around the world, helping the shipping industry make the move to a more sustainable fuel solution," Leprince-Ringuet added.

The original time charter agreement was signed by parties in 2018 with construction commencing at Hudong-Zhonghua Shipbuilding's yard the same year.

Second LNG bunker vessel due 2021

In December last year, TMFGS and MOL signed a long-term charter contract for a second large LNG bunker vessel, which is now set to be delivered in 2021. The new vessel will be positioned in the Marseille-Fos area in France to supply LNG

as a marine fuel within the Mediterranean area.

"I am very confident that our endeavour will be the great milestone and the turning point in this rapidly changing world. The transition from heavy fuel oil to LNG is competitive, environmentally efficient and an immediately available solution for maritime transportation. By providing the capacity to deliver LNG as a marine fuel, this partnership will be the leader in transition to a more fuel-efficient industry," Takeshi Hashimoto, Executive Vice President of MOL, said.

Headquartered in Tokyo, Japan, MOL is one of the largest shipping lines in the world. French multinational integrated oil and gas company Total is considered one of the seven "Supermajor" oil companies in the world.



Gas Agility

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Petronas hails first STS LNG bunkering in Malaysia

State-owned oil and gas company Petrolia Nasional Berhad (Petronas) has completed the first commercial LNG bunkering operation in Malaysia.

The refuelling operation was completed between the newbuild bunker vessel *Avenir Advantage* and the vehicle carrier *Siem Aristotle*, operated by Volkswagen.

Owned by fuel supplier Avenir LNG the bunker vessel is leased for a period of three years by Petronas from Future Horizon, a

joint-venture company between MISC and Avenir LNG.

The bunker operation was carried out south of Pasir Gudang Port, Johor and will go on to provide LNG bunkering services to international and domestic vessels along the Straits of Malacca.

Headquartered in the UK,

Avenir LNG is a fully integrated small-scale LNG supplier.

Flexible design

Avenir LNG received the bunker vessel in October as the first step in a wider strategy to expand small-scale LNG supply.

"The flexible design of our vessels allows us to support the development of the LNG bunker fuel market whilst adding to the global small-scale supply fleet; thereby supporting our strategic objective of supplying natural gas to otherwise inaccessible areas," Milorad Doljanin, CEO Avenir LNG Limited, commented.

The new vessel is the first of

two ships ordered from Keppel Nantong Shipyard, each with capacity of 7,500 cubic metres of LNG and two Type C tanks. A further four vessels are on order from Nantong CIMC Sinopacific Offshore & Engineering with two of these featuring 20,000 cubic-metre-capacity.

The firm also plans to develop the HIGAS LNG import facility in Italy, which will be the first certified small-scale LNG facility of its kind in Sardinia. Featuring capacity of 10,800 cubic metres, the terminal is currently under construction and expected to be fully operational by the end of the year.



Petronas launches LNG-bunkering business

Mitsubishi, Air Water launch compact LNG fuelling trial

Engineering group Mitsubishi and industrial gases specialist Air Water have launched a trial of a novel compact LNG filling system, designed to serve fuel heavy trucks.

The proposed system is under development by the partners in Japan and is designed as the world's first off-grid power-generation system capable of fuelling trucks

"With a footprint of just 3.3 x 12 meters, the same size as a parking space for a heavy truck, the new system is less than half of the cost of a conventional LNG filling station. At less than 10 minutes per fill-up, it also refuels quicker than conventional stations," a spokesperson for Mitsubishi said.

Portable refuelling

The first portable filling system in Japan, the technology relies on circulating hot water through a waste-heat recovery mechanism

to prevent freezing problems associated LNG operations in cold or highly humid regions.

Testing of the new system in Hokkaido commenced in November, with three heavy LNG trucks in the initial trial, one Isuzu vehicle and two manufactured by an Italian firm. Energy provider Hokkaido Electric Power will collaborate in the trial to assess the system's overall effectiveness.

"The results of the tests will help the partners to determine whether or not to make the system commercially available," the firms noted.

Fuel transition

At present, approximately 500,000 heavy trucks are on Japan's roads and of these a



Compact LNG filling station and heavy LNG truck

majority are diesel-fuelled.

"There are growing concerns about the need to reduce their CO2 emissions... This joint project represents a meaningful step towards our transition to cleaner energies, and both partners are confident that it can help to realize low-carbon or carbon-free so-

cieties in the future," a Mitsubishi spokesperson commented.

The partners are considering ways to further reduce CO2 emissions in the future, such as by using CO2-free LNG, and estimate that all LNG-fuelled trucks in the trial will have ranges in excess of 1,000 kilometers.

LNG Fuelling

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Third of European ports deploy LNG bunkering

A third of ports in Europe have made LNG bunkering available, according to a new study by the European Sea Ports Organisation (ESPO).

The organisation's 2020 environmental report covers more than 60 different environmental performance benchmarks and outlines a growing provision of green shipping services.

"When it comes to LNG, one third of ports has made LNG bunkering available, LNG being mainly provided by trucks and by barges," the ESPO said in a statement.

All of the ports supporting LNG bunkering utilise truck refuelling and in 34% of cases used barges. In parallel, 57% of ports offer environmentally differentiated fees for ships that go beyond regulatory standards.

Environmental priorities

The new report includes a ranking of the Top 10 environmental priorities at European ports, with Air quality, climate change and energy efficiency taking the top three spots.

"With regard to the green services to shipping, a growing share of ports are offering shore-side electricity for ships at berth (OPS)



LNG bunkering coupling

in 2020, with 58% of sampled ports providing this service," the report's authors note.

Of those ports already providing OPS, 46% provide high voltage electricity suitable for seagoing vessels. Of the total 40% are planning to offer OPS in the coming two years.

Green shipping grows

The ESPO also identified that two thirds of European ports are now certified with an environmental standard, such as ISO, EMAS, Eco-Ports' PERS, an increase of 11% since 2013.

81% of ports have set up an environmental monitoring program,

waste being the most monitored issue," the ESPO states.

Headquartered in Brussels, Belgium, the ESPO represents port authorities, port associations and port administrations across the EU and Norway with observer members in Iceland, Israel, Ukraine and the UK.



LNG vessel at dock

Japan launches first LNG-fuelled PCTC

Shipping group NYK Line has launched Japan's first pure car and truck carrier (PCTC) to be fuelled by LNG, as part of a fleet-wide revamp.

The new PCTC entered service in October, transporting vehicles produced by Toyota Motor.

The launch was hailed as a

milestone in the uptake of LNG as marine transport fuel in Japan.

"In the field of large cargo ships, NYK is positioning LNG fuel

as one of the bridge-solutions until future zero-emission ships are realized. *Sakura Leader* takes the lead in NYK's plan to switch its operating ships to LNG-fueled vessels," a spokesperson for NYK Line said.

World's largest PCTC

The vessel is one of the largest PCTCs in the world, with capacity to carry around 7,000 standard vehicle equivalent units per voyage, and was fabricated at Shin Kurushima Toyohashi Shipbuilding.

"The ship was named *Sakura Leader*, taking its name from the Japanese word for "cherry blossoms," the national flower of Japan, with a wish for realizing and passing on a flourishing environment to the next generation through eco-friendly transportation," an NYK spokesperson commented.

The *Sakura Leader* was chosen

by Japan's Ministry of Environment as a model project and will receive ongoing support to conduct technical verification of CO2 emission reductions during actual voyages.

Second LNG-fuelled PCTC in 2022

Following the successful design, fabrication and launch of the *Sakura Leader*, NYK now plans to switch all its future newbuild PCTCs to clean fuels, such as LNG.

A second LNG-fuelled PCTC will be delivered in 2022, and an LNG-fuelled coal carrier will be delivered in 2023.

NYK is one of the world's largest shipping companies and is headquartered in Chiyoda, Tokyo. The group operates a fleet of more than 700 ships, including container ships, tankers, bulk carriers, Ro-Ro car carriers, reefer vessels, LNG carriers and cruise ships.



Naming ceremony for *Sakura Leader*

Kaguya completes first LNG bunkering

Japan's largest LNG-powered vessel, the *Sakura Leader*, has been refuelled in the country's first Ship-to-Ship LNG bunkering operation.

The giant pure car and truck carrier (PCTC) was fuelled at berth in Shin Kurushima Toyohashi Shipbuilding yard where it was constructed earlier this year.

Fuelling operations were carried out by joint venture fuelling specialist Central LNG using its new LNG bunker vessel *Kaguya*.

3,500 m3 capacity

The *Kaguya* was constructed by Kawasaki Heavy Industries and Sakaide Works and features LNG cargo tank capacity of 3,500 cubic metres. Measuring over 81 metres in length and 18 metres in breadth, the vessel has a gross tonnage of 4,044 tonnes.

"The LNG fuel supplied by *Kaguya* was loaded at JERA's Kawagoe Thermal Power Station prior to this Ship-to-Ship bunker-

ing," a spokesperson for Central LNG commented.

The bunker vessel will be based at Kawagoe Thermal Power Station and is now set to begin supplying LNG fuel to ships in the Chubu region using Ship-to-Ship bunkering

LNG demand rise

A joint venture between NYK, Kawasaki Kisen Kaisha, JERA, and Toyota Tsusho, Central LNG expects demand to rise sharply as its parent groups plan major new infrastructure investments over the next decade.

NYK, which owns the *Sakura Leader*, announced plans to launch the world's first large LNG-fueled coal carrier in 2023 as it plans to convert a significant portion of its fleet from Marine Heavy Fuel Oil to LNG.



Kaguya refuels *Sakura Leader*

CMA CGM names world's largest LNG-fuelled container ship

Shipping line CMA CGM has welcomed the world's largest LNG-fuelled container ship to its fleet, the *Jacques Saade*.

The giant vessel has capacity for 23,000 twenty-foot-equivalent (TEU) containers and completed its first bunkering operation at the Port of Rotterdam in November, bunkering around 17,300 cubic metres of LNG. It was inaugurated in October at a first-of-its-kind digital naming ceremony.

"This vessel has been enhanced with the latest technologies and is the result of 7 years of research and development. While guaranteeing the safety of our crew, it preserves air quality and will be part of our fight against global warming. It significantly improves the environmental footprint of carried goods," Rodolphe Saadé, CEO of CMA CGM, said.

Nine ULCV

CMA CGM has ordered nine LNG-fuelled ultra-large container vessels (ULCV) to date and announced plans to invest further in low-emission fuel technologies over the next decade.

"The *Jacques Saade*, along

with its eight sister ships will be registered at the French International Register. They will bear the names of landmark Parisian monuments and other renowned venues and institutions from throughout the French capital," CMA CGM said in a statement.

The LNG containerships will all feature a straight bow with an integrated bulb, a redesigned rudder, and a redesigned propeller to substantially improve the vessels'

hydrodynamics and reduce energy consumption.

Industry collaboration

The development of the ULCVs has brought together many of the leading LNG fuel firms in the world, with CMA CGM highlighting the contributions of: BIO-UV Group, CSSC, Cryostar, Bureau Veritas, BLM, GTT, Schneider Electric, Sperry Marine, Total, Rotterdam Port, Wärtsilä, and WIN GD.

"From its design all the way to its operation... the *Jacques Saade* benefited from the know-how and expertise of the best French, European, and global industry leaders," a spokesperson for CMA CGM commented.

Headquartered in Marseille, France, CMA CGM is the fourth largest container shipping line in the world, operating 200 shipping routes between 420 ports in 150 different countries.



The *Jacques Saade* and crew



CMA CGM *Jacques Saade*

Singapore calls for LNG bunkering proposals

Authorities in Singapore have called for bids from LNG bunker firms to expand refuelling infrastructure across the island state.

The Maritime and Port Authority of Singapore (MPA) issued a request for proposal (RFP) alongside the announcement that it will approve up to two additional LNG bunker supplier licenses.

This follows from a recent announcement at the 21st Singapore International Bunkering Conference and Exhibition,” a spokesperson for the MPA said.

End-to-end bunkering solutions

The RFP will be open until the 15 December 2020 and interested parties are requested to submit a proposal for an “end-to-end LNG bunkering solution”, which should include “details about its LNG supply and delivery model, its LNG sources and its marketing plan for the sale of LNG bunker.”

“MPA seeks to announce the successful award of new LNG bunker supplier licence(s), if any, by February 2021,” the firm said in a statement.

The port currently has two licensed LNG bunker suppliers, state-owned firm Pavilion Energy and local fuel specialist FuelNG.



Port of Singapore

First movers

The Singapore Government has invested heavily in its strategy to develop the island as a regional LNG bunkering and gas trading hub and earlier this year FuelNG inaugurated Singapore’s first LNG bunkering vessel.

The expansion of LNG bunkering at the port is expected to support demand from shipping lines as an increasing number of large-scale vessels switch to the fuel to meet environmental regulations in ports around the world.

“As the maritime community

continues the search for low or zero-carbon fuels to meet IMO’s 2050 goals, LNG is a viable transitional fuel to mitigate CO2 emissions from ships. A number of first movers have made investments in LNG-fuelled vessels, including CMA CGM, Hapag Lloyd, Eastern Pacific Shipping and BHP,” Chee Hong Tat, Singapore’s Senior Minister of Transport, said.

Pavilion Energy is a wholly-owned subsidiary of the nation’s Sovereign Wealth Fund Temasek and has been a major investor in the island’s infrastructure. ■

NEWS NUDGES

LNG spot prices drive fuel uptake

Demand for LNG as a maritime transport fuel is growing in Asia on the back of lower prices.

Data from Refinitiv Eikon suggests LNG spot prices are roughly \$131 per tonne less than very low sulphur fuel oil on average across 2020.

Analysts predict that while the gap is set to widen as more supply hits the market over the next few years.

Rotterdam LNG bunker fleet rises to nine

Authorities at the Port of Rotterdam report that a total of nine LNG bunker vessels operate in the port area.

“The introduction of these new LNG-powered vessels supports the Port Authority’s ambition to serve as a key hub in the import, export, storage and bunkering of LNG,” a spokesperson for the port said.

Between them the nine ships are forecast to bunker 300,000 cubic metres of LNG per year. ■



Singapore LNG terminal



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IAPH publishes LNG ready terminal tool

The International Association of Ports and Harbors (IAPH) has published a new LNG Ready Terminal tool, providing guidance for safe handling of LNG-fuelled vessels.

The tool was issued by the IAPH Clean Marine Fuels (CMF) working group and designed to equip port authorities with a vital resource to

meet increasing uptake of LNG-fuelled newbuild and retrofitted vessels calling at their ports. "This sought-after tool is now

available for ports to use and completes the IAPH CMF suite of tools for LNG bunkering," Cees Boon, of the Port of Rotterdam and lead on the LNG Ready Terminal tool, commented.

Safe cargo handling

Input for the LNG Ready Terminal tool was received from a range of IAPH CMF member experts and it forms the latest in a series of instruments for improved LNG fuel handling on dock.

"As the IAPH Clean Marine Fuels Working Group, we aim to offer ship owners as broad a spectrum of alternative fuels as possible in order to improve air quality and reduce greenhouse gas emissions in and around ports and harbours," a spokesperson of IAPH said.

World Ports Sustainability Program

The new instrument is tied to the IAPH's World Ports Sustainability Program, which provides coordination for ports to achieve the 17 UN sustainable development goals (SDG).

"The increasing uptake of LNG-fuelled newbuild and retrofitted vessels means terminals need to be ready to receive them and to be able to do safe cargo handling during LNG bunkering operations. Although these vessels are safe by design, terminals need to prepare by reviewing their existing safety procedures.

Headquartered in Tokyo, Japan, the IAPH is a global trade association for seaports worldwide and has been in operation over 60 years.



Vessel bunkering LNG

KR launches LNG bunkering simulation centre

Classification society the Korean Register of Shipping (KR) has opened a new LNG bunkering simulation centre in Busan, South Korea.

The new LSC centre was announced in partnership with engineering firm Transgas Solution (TGS). Under the terms of a memorandum of agreement, the LNG solutions provider will build an Operator Training Simulator (OTS) system at the centre, to train operators of LNG-propelled ships and for ship-to-ship bunkering.

"I welcome this collaboration with KR, our work to develop advanced education and training using the Operator Training Simulator (OTS) is hugely important, and underpins our commitment to training LNG experts across the maritime sector and engineering industry," LEE Jae-ik, CEO of TGS, said.

Virtual reality

The new facility will be located in the KR headquarters and will provide a range of training and services from tailored trial and

operations for the supply of LNG fuel systems to detailed liquefied gas risk analysis.

"KR is already renowned for providing world's best technical services for structural strength assessment, temperature distribution analysis, and thermal stress analysis of LNG carriers," Ha Tae-beom, EVP of KR's Research and Development division, said.

Alongside operational training the new centre will also develop next-generation education platforms for shipping companies, shipyards, and equipment companies, combining OTS with Virtual Reality (VR). The LSC centre was official opened on the 15th September.

Increased competitiveness

The LSC facility is expected to facilitate industrial growth in South

Korea's nascent LNG propulsion and bunkering sector and support wide-spread roll out of fuelling infrastructure across the country.

"We will increase competitiveness by providing high-quality LNG technology services to our customers - shipping companies and shipyards around the world," Tae-beom said.

The South Korean government has been keen to promote LNG as a bunker fuel through investment in infrastructure designed to drive a transition to LNG in the maritime sector. State-owned LNG importer Kogas forecasts that domestic LNG bunkering demand is set to grow to 311,000 tonnes per year by 2022.



KR and Transgas representatives at signing ceremony

FueLNG inaugurates bunkering vessel *Bellina*

Fuelling specialist FueLNG has named Singapore's first LNG bunkering vessel, *FueLNG Bellina*, ahead of first scheduled operations by the end of the year.

The vessel was dedicated at a virtual ceremony attended by Singapore's Senior Minister of State for Transport, Chee Hong Tat, and will now begin initial operations in the waters around Singapore.

"It is our next step towards regular ship-to-ship LNG bunkering activities in Singapore. As we progress towards a low-carbon future, we will intensify our efforts to develop the Port of Singapore into a global LNG bunkering hub," Tat said.

Floating Living Lab

A joint venture between Keppel Offshore & Marine and Shell Eastern Petroleum, FueLNG will also develop the island state's first dedicated LNG bunkering facility, as part of the Floating Living Lab (FLL) project.

Under construction by Keppel O&M, the FLL is set to become operational at the end of 2021. The LNG bunkering facility will be able to receive vessels such as harbour crafts and small vessels from the facility, with a capacity of 3,500 cubic metres.

"Building Singapore's first LNG bunkering vessel and having a dedicated bunkering facility demonstrate our commitment to global customers that LNG as a marine fuel will be readily available in Singapore," Chris Ong, Chairman

Naming Ceremony

of Singapore's first LNG bunkering vessel



FUELNG Keppel Offshore & Marine



FueLNG naming ceremony

of FueLNG and CEO of Keppel O&M, added.

MPA support

LNG bunkering options will range from ship-to-ship bunkering for larger vessels, such as container-ships, to refuelling infrastructure for smaller vessels such as harbour crafts.

The FueLNG *Bellina* features a capacity for 7,500 cubic metres of fuel and supports initiatives implemented by the Maritime and Port Authority of Singapore (MPA) to increase the adoption of LNG as a marine fuel.

"Singapore is an important country for Shell and it will be a key region of the world for our Downstream LNG business," Tahir Faruqui, Director of FueLNG and Head of Downstream LNG at Shell, explains "LNG will play a critical role in the journey towards zero emission fuels while zero and low-carbon fuels are being developed. It is the cleanest fuel currently available to the shipping sector in meaningful volumes. Collaboration

is essential to reach milestones like this and I'd like to highlight and thank the MPA for supporting the growth of LNG as a marine fuel."

The firm predicts that expansion of LNG bunkering infrastructure will extend opportunities in adjacent sectors, such as ship design, construction, operation and repair, as well as boosting demand for LNG trading in Singapore.



Artist's rendition of Floating Living Lab

NEWS NUDGES

GTT orderbook grows

LNG specialist GTT has reported that consolidated revenues were up 53% for the first nine months of 2020, boosted by demand for LNG carriers.

"With a total of 38 orders booked since the start of the year for all segments taken together, GTT's commercial activity continue to progress at a firm pace, and LNG demand is maintaining its upward trend, driven by Asia," Philippe Bertierotière, CEO of GTT, said.

In addition to 12 LNG carriers booked during the first half of the year, a further 6 orders

were booked in the third quarter of 2020, this included an order for 10 ice-breaker LNG carriers.

The firm also announced that the Korea Fair Trade Commission had concluded a hearing into the firm's commercial practices with Korean shipyards.

"GTT and its counsels participated in this hearing and previously responded in writing to the preliminary conclusions set out by the Examiner Report. GTT will keep the market informed about the KFTC decision when released," a spokesperson for GTT said.

DNG Energy secures LNG bunker license

South African fuel firm DNG Energy has received approval to commence LNG bunkering in the Port of Coega, South Africa from 2021.

The authorization marks the first such license issued in Africa and will enable vessels to refuel at the port in the Eastern Cape from as early as next year.

“Our country is poised to become a premium LNG bunkering hub in the Southern Hemisphere. The licence enables us to respond to environmental, legislative and business needs for the South African and the international LNG fuel markets. We are happy to be part of the solution in the quest to decarbonise the shipping industry by offering LNG as a transition fuel that is safer for marine species,” Aldworth Mbalati, CEO of DNG Energy Group, said.

LNG demand growth

The group expects South African demand for LNG to rise rapidly

over the coming decade, with bunkering volumes set to reach at least 2.4 million tonnes of LNG a year by 2024, as more and more operators switch to the fuel to meet emissions targets.

“We are positive about the future of South Africa and supplying the cheapest possible gas that we can find to power the economy is our contribution towards achieving socio-economic aspirations of the country in a responsible manner,” Mbalati commented.

Delivery of storage and bunkering equipment is expected to take place imminently with DNG planning to deploy its floating storage unit (FSU) in the near term.

Terminal infrastructure

Following license authorization the company is now also seeking to fi-



Port of Coega

nalize plans to develop a more permanent terminal, supplementing floating infrastructure at the new Coega deep water port facility.

“The next steps include completing our terminal infrastructure at Algoa Bay and finalising delivery of our storage and bunkering equipment. We are poised to be

the gas solutions provider for local and international markets by adding value in the gas value chain,” adds Mbalati.

Based in Sandton, South Africa, the group also plans to acquire two LNG bunkering vessels, to support refuelling of larger LNG-fuelled vessels further offshore. ■

Total secures LNG-fuelled Aframax

Energy major Total has signed contracts to charter four new LNG-powered Aframax-type vessels by the end of 2023.

The move will see Total charter the first two vessels from Singaporean shipowner Hafnia and a further two from Norwegian firm Viken Shipping.

“LNG as a Marine Fuel remains the best and immediately available solution to reduce the carbon footprint of our shipping activities. With these four new vessels, we reaffirm our commitment to expand the use of cleaner marine fuels, for a more sustainable shipping,” Luc Gillet, Senior Vice President Shipping at Total, commented.

Total Marine Fuels

Fuel for the new vessels will be provided by Total’s dedicated bunkering subsidiary, Total Marine Fuels Global Solutions. All four vessels are scheduled for delivery in 2023 and each will have a capacity of 110,000 tons of refined products.

“A true technological breakthrough in the service of environmental protection, LNG is now the best available and technologically proven solution to significantly reduce the environmental footprint of maritime transport,” Total said

in a statement.

Total is now the second-largest private global LNG player, with a projected overall portfolio of around 50 million tonnes per year by 2025 and a worldwide market share of around 10 percent.

Climate ambition

The new charters are part of the firm’s wider Climate Ambition programme, which sees LNG as an integral part of the company’s future fleet and a driver for emissions reductions.

“This chartering contract is in

line with our Climate Ambition and will contribute to our Net Zero carbon neutrality target by 2050 or before. This contract follows a similar one, signed earlier this year, for two LNG-powered VLCC (Very Large Crude Carriers), to be delivered in 2022,” Gillet added.

Headquartered in Courbevoie, France, Total is one of seven “supermajor” oil companies and operates liquefaction plants in Qatar, Nigeria, Russia, Norway, Oman, Egypt, the United Arab Emirates, the US, Australia and Angola. ■



Total charts four new LNG-powered Aframax

Epik announces plans for Newcastle LNG bunkering

LNG project development firm Epik is to add bunkering services to its proposed Newcastle GasDock LNG import terminal in Australia.

The new terminal at the Port of Newcastle in New South Wales will provide an industrial hub for the maritime sector and will address tightening Australian east coast gas market ahead of 2023 peak demand period.

“The addition of LNG bunkering is a logical extension of the Newcastle GasDock project and will allow our customers to take advantage of LNG’s demonstrated environmental benefits, helping to reduce carbon emissions globally and dramatically reducing marine emissions locally,” Jee Yoon, EPIK Managing Director, said.

Cruise demand

The new LNG bunkering infrastructure will be a first for the region and could serve a significant proportion of the estimated 2,000 vessels that visit the port each year.

“The cruise industry in particular has distinguished itself as a major early adopter of LNG as a marine fuel and EPIK expects that the Sydney Harbour cruise sector, with over 300 annual cruise ship port calls, could require more than a quarter of a million tons of LNG annually over the coming

years,” a spokesperson for Epik said.

Bulk carriers, which make up a significant portion of Port of Newcastle marine traffic, are also forecast to generate considerable new demand.

ECA designation

The introduction of LNG bunkering facilities at the port was highlighted as a vital step towards greater uptake of the fuel as Epik forecast future regulation may create Emission Control Areas (ECA) in certain Australian coastal waters.

“While Australian coastal waters are not currently classified as an ECA, some analysts anticipate a future ECA designation, which will require many shippers to invest in cleaner fuelling systems in order to comply. The Newcastle GasDock project would provide the necessary infrastructure to provide shippers with competitive, clean-burning LNG,” a spokesperson for Epik said.

Last year, the Newcastle GasDock project was declared ‘Critical’ State Significant Infrastructure (CSSI) for social, economic and environmental reasons.



LNG vessel

NEWS NUDGES

MAES adds Londerzeel LNG lanes

Belgium fuel retailer MAES has added LNG fuelling lanes at its MAES Londerzeel site.

The firm also announced the introduction of Hydro treated Vegetable Oil (HVO100) fuel at its filling stations in Londerzeel and Ruisbroek, Belgium. The

fossil-free fuel marks a first for the firm and provides a high-end diesel substitute.

The firm states that HVO100 is the most sustainable fuel for diesel vehicles with 89% less CO₂, 30% less particulate matter and 9% less nitrogen oxide as compared to regular diesel.



Newcastle Port

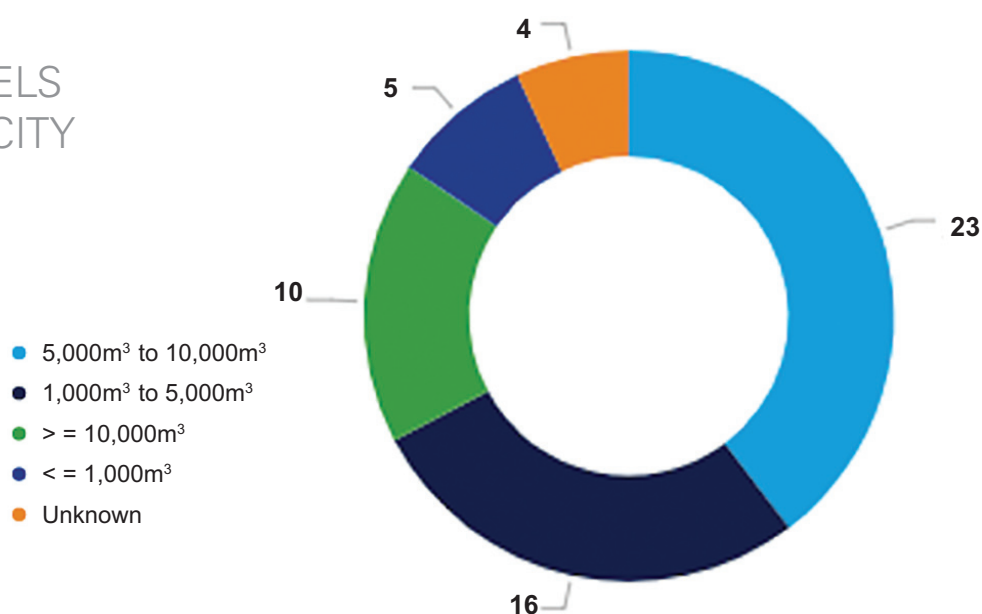
LNG BUNKER VESSELS

Vessel Name	Home Port	Delivery year	Country	LNG Tank Capacity	Owner	Operator
Seagas	Stockholm (Loudden)	2013	Sweden	187	Gasum	AGA
Coral Energy	Risavika	2013	Europe	15000	Anthony Veder	
Yidu inland river LNG bunker barge	Yidu port	2014	China	500	Xilan Natural Gas Group	Xilan Natural Gas Group
Coralius	Risavika	2017	Norway	5600	Sirius Veder Gas	Sirius Rederi
Cardissa	Rotterdam	2017	The Netherlands	6500		Shell Shell
ENGIE Zeebrugge	Zeebrugge	2017	Belgium	5100	Gas4Sea (Engie, NYK Line, Mitsubishi Corporation and Fluxys)	NYK
Coral Methane	Rotterdam	2018	Netherlands	7551	Anthony Veder	Shell
Kairos	Lithuania	2018	Lithuania	7500	Bernhard Schulte	Nauticor
Clean Jacksonville	Jacksonville Jax LNG	2018	United States	2200	TOTE	FOSS Maritime
Oizmendi	Huelva	2018	Spain	600	Cepsa	Cepsa
Bunker Breeze	Algeciras	2018	Spain	1200	Suardiaz Energy Shipping	
Coral EnergICE	Risavika	2018	Europe	18000	Anthony Veder	
FlexFueler 001	Amsterdam	2019	Netherlands	1480	Titan LNG	Titan LNG
Coral Fraseri	Unknown	2019	Global	10000	Anthony Veder	
LNG London	Rotterdam	2019	Netherlands	2998	LNG Shipping (Victrol & Sogestran)	
FlexFueler 002	Antwerp	2020	Belgium	1480	Titan LNG	Titan LNG
NYK Western Japan LNG bunker vessel	Setouchi and Kyushu, Japan	2020	Japan		NYK, Kyushu Electric Power, Saibu Gas and Chugoku Electric	NYK, Kyushu Electric Power Co., Inc., Saibu Gas Co
Naturgy LNG bunker vessel	Barcelona	2020	Spain	6000	Naturgy	Naturgy
Gas Agility	Northern Europe	2020	Netherlands	18600	Mitsui OSK Lines Ltd (MOL)	Mitsui OSK Lines Ltd (MOL)
KOGAS LNG bunker vessel	Busan	2020	South Korea	7500	Korea Line	Korea Line
Pioneer Knutsen		2020	Norway	1100	Knutsen OAS Shipping	Knutsen OAS Shipping
Q-LNG ATB Bunker Barge 4000	Port Canaveral, FL	2020	United States	4000	Q-LNG	Harvey Gulf International Marine
FueLNG Bellina	Singapore	2020	Singapore	7500	FueLNG	FueLNG
ENN LNG bunker vessel	Zhoushan	2020	China	8500	ENN Energy	ENN Energy
Kaguya	Chubu region (Central Japan)	2020	Japan	3500	CLS (JV established by K Line, JERA, NYK and Toyota Tsusho Corporation)	CLMF (JV by CLS partners)
Avenir Accolade		2020	Brazil	7500	Avenir LNG	
Avenir Advantage		2020	Malaysia	7500	Avenir LNG	
Oslo Tank	Bergen	2020	Norway	850	Bergen Tankers	
Poseidon Med II bunkering barge	Revithoussa	2020	Europe	4000	Venture led by DEPA	
Titan Hyperion	TBD	2021	Netherlands	8000	Titan LNG	Titan LNG
FUKUOKA FUKUOKA 1350	Yokohama	2021	Japan	2500	Ecobunker shipping	Ecobunker shipping
Avenir bunker vessel 3	Oristano, Sardinia	2021	Europe	7500	Avenir LNG	
Domestic LNG Bunkering Vessel in China	Not yet decided (China)	2021	China	6000	CNOOC	
Domestic LNG Bunkering Vessel in China	Not yet decided (China)	2021	China	12000	CNOOC	
FSU and LNG Bunker Barge, Port of Coega, South Africa	Port of Coega	2021	South Africa	145000	DNG Energy	
MOL LNG bunker vessel	Singapore	2021	Singapore	12000	Mitsui OSK Lines Ltd (MOL)	

For more information please visit www.dnvgl.com
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Vessel Name	Home Port	Delivery year	Country	LNG Tank Capacity	Owner	Operator
Small LNG bunkering vessel in South Korea		2021	South Korea	500	Ministry of Oceans and Fisheries	
Woodside Western Australia LNG bunker vessel	Dampier	2021	Australia	12000		
Optimus		2021(Q1)	Europe	6000	Eesti Gaas	Elenger
TBN 1		2022	Spain	5000	Knutsen OAS Shipping	Knutsen OAS Shipping
Clean Canaveral	Jacksonville, FL	2022	United States	5400	Polaris New Energy	
DEPA Limassol	Limassol	2022	Greece	4000	DEPA	
DEPA Piraeus	Piraeus	2022	Greece	4000	DEPA	
LNG bunker barge GALP		2022	Portugal		GALP	
Shell LBV	Not yet decided	2022	--	18000	Shell have sent out a tender for the vessel, but ownership is not decided	
Cryopeak LNG	Vancouver	2022/3	Canada	4000	Cryopeak	
LNG Bunker & Feeder Vessel Reganosa	Mugardos	2023	Spain	10000	Reganosa	
LNG bunker vessel Swinoujscie	Swinoujscie	2023	Poland		Polskie LNG	
Shturman Koshelev LNG bunker vessel		2020(4Q)	Europe	5800	Shturman Koshelev LLC	Gazpromneft Marine Bunker Ltd (Gazpromneft)
Avenir bunker vessel 4 (Location unknown)	Not yet decided (being built in China)	Aug 2021	China	7500	Avenir LNG	
Avenir bunker vessel 5 (Location unknown)	Not yet decided (being built in China)	Jun 2021	China	20000	Avenir LNG	
PRO2	Hong Kong	Q12023	Hong Kong	7600	LNG PRO Bunkers	TBN (Probunkers group company)
PRO1	Houston	Q42022	United States	7600	LNG PRO Bunkers	TBN (Probunkers group company)
Avenir bunker vessel 6 (Location unknown)	Not yet decided (being built in China)	Sep 2021	China	20000	Avenir LNG	
Q-LNG ATB Bunker Barge 8000	TBD	TBD	United States	8000	Q-LNG	Harvey Gulf International Marine
FlexFueler 003	Zeebrugge	TBD	Belgium	1480	Titan LNG	
FlexFueler 004	Lubeck	TBD	Germany	1480	Titan LNG	
Polaris ATB No. 2	Jacksonville, FL	TBD	United States		Polaris New Energy	

BUNKER VESSELS BY TANK CAPACITY



WORLD SMALL SCALE LNG FLEET*

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
1974	Seagas	187	LNG	Sweden	Yes	AGA
1988	Kayoh Maru	1,517	LNG	Japan	Yes	Daiichi
1993	Aman Bintulu	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1996	Surya Aki	19,475	LNG	Indonesia - Japan	Yes	MCGC
1997	Aman Sendai	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1998	Pelita Energy	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	Triputra	23,096	LNG	Indonesia - Japan	Yes	MCGC
2003	Pioneer Knutsen	1,100	LNG	Norway	Yes	Knutsen
2003	Shinju Maru No.1	2,540	LNG	Japan	Yes	Shinwa
2005	North Pioneer	2,500	LNG	Japan	Yes	Japan Liquid Gas
2007	Sun Arrows	19,531	LNG	Malaysia - Russia - Japan	Yes	Mitsui
2008	Kakurei Maru	2,536	LNG	Japan	Yes	Hogaki Zosen
2008	Shinju Maru No.2	2,540	LNG	Japan	Yes	Shinwa
2009	Coral Methane	7,551	LNG/LPG/Ethylene	Northwest Europe/Baltics	Yes, sometimes	Anthony Veder
2010	Coral Favia	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2010	Coral Fraseri	10,000	LNG/LPG/Ethylene	Worldwide	No	Anthony Veder
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
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	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	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
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	PetroChina TBN	30,000	LNG	China		PetroChina
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	LNG Prime	2,250	LNG	Northwest Europe	Yes	Veka Deen LNG
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	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2017	Oizmendi	600	LNG	Bilbao	Yes	Itsas Gas
2017	ENGIE Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	Coralius	5,800	LNG	Northwest Europe/Baltics	Yes, for Skangas	Anthony Veder
2017	Cardissa	6,500	LNG	Northwest Europe	Yes	Shell
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya

For more information please visit <http://small-lng.com>*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less
TBN = To Be Nominated indicates ships are still at construction/planning stage

** = project shelved † =Data to be verified Data last updated = 16th November 2020

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	Coral EnergiCE	18,000	LNG	Northwest Europe/Baltics	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	Coral Encanto	30,000	LNG	China	Yes	Anthony Veder
2018	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang
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	Kairos	7,500	LNG	Baltic	Yes	Bernhard Schulte
2018	Bunker Breeze	0	LNG	Barcelona	Yes	Suardiaz Energy Shipping
2019	SM Jeju LNG1	7,500	LNG	Korea	Yes	Korea Line
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2019	Gas Agility	18,600	LNG	NWE	Yes	MOL
2019	Flexfueller 001	1,480	LNG	Amsterdam	Yes	Titan LNG
2020	SM Jeju LNG2	7,500	LNG	Korea	Yes	Korea Line
2020	CNTIC VPOWER Global	28,000	LNG	Myanmar	Yes	Dalian Inteh Group
2020	Q-LNG 4000	4,000	LNG	US Coast	Yes	Q-LNG Transport/Harvey Gulf
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	FuelLNG TBN	7,500	LNG	Singapore	Yes	FuelLNG
2020	CLS TBN	3,500	LNG	Japan	Yes	CLS
2020	Elenger TBN	6,000	LNG	NWE	Yes	Elenger
2020	ENN TBN	8,500	LNG	China	Yes	ENN
2020	Flexfueller 002	1,480	LNG	Antwerp	Yes	Titan LNG
2020	Ecobunker Tokyo Bay	2,500	LMG	Japan	Yes	Ecobunkers
2021	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2021	Knutson TBN	30,000	LNG	Mediterranean	Yes	Knutson OAS
2021	Gazprom Neft TBN	5,800	LNG	Russia	Yes	Gazprom Neft
2021	PE TBN	12,000	LNG	Singapore	Yes	MOL
2021	JMU TBN	2,500	LNG	Japan	Yes	JMU
2021	TBN	18,600	LNG	Mediterranean	Yes	MOL
2021	TG TBN	500	LNG	Korea	Yes	Trans Gas
2022	Stolt TBN	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2022	Stolt TBN	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2022	Clean Cañaveral	5,400	LNG	USG	Yes	PNE
2023	Cryopeak TBA	4,000	LNG	West Canada	Yes	Cryopeak
2024	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2024	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2026	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2026	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas

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