

LNG Fuelling

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Total, Pavilion sign Singapore LNG bunker deal

Energy firms Total and Pavilion Energy have signed a Heads of Agreement (HoA) to jointly develop LNG bunker infrastructure at the port of Singapore.

The wide-ranging deal will see Total Marine Fuels Global Solutions collaborate with Pavilion Gas to create an entirely new LNG supply chain at the port that will include a next generation LNG bunker vessel to be commissioned by 2020.

"Pavilion Energy is pleased to work with Total on establishing a robust LNG bunker supply chain in Singapore. Our partnership sets the stage for making LNG bunker readily and reliably available for the market. Together, we mark a decisive step forward in leading the change towards cleaner and more responsible solutions with LNG bunkering in the region," Tan Sri Mohd Hassan Marican, Chairman of Pavilion Energy, said.

"Significant step forward" for Singapore LNG hub

The HoA was signed by Pouyanné and Pavilion Energy chairman Tan Sri Mohd Hassan Marican at the sidelines of the recent World Gas Conference 2018.

Backed by Singapore's sovereign wealth-fund Temasek



Patrick Pouyanné CEO of Total and Tan Sri Mohd Hassan Marican of Pavilion Energy

Holdings, Pavilion Gas is appointed by the Singapore Energy Market Authority (EMA) as an LNG Importer and is responsible for the marketing and distributing of natural gas in the country.

Both firms hailed the agreement as a "significant step forward" and highlighted LNG as an "available and competitive solution" to tackle greenhouse gas emissions.

"The agreement signed with

Pavilion Energy marks a new step in our commitment to provide our customers with fuels that are more environmentally friendly, particularly in Singapore which is the leading bunkering hub in the world," Patrick Pouyanné, Chairman and CEO of Total, said.

Total sees LNG bunkering take-off

The partnership follows several investments by Total in the European LNG bunker market, including supply contracts for Brittany Ferries and CMA CGM, alongside a long-term bunker vessel charter with Mitsui O.S.K. Lines in Northern Europe.

"The development of infrastructure is one of the key drivers for the take-off of LNG as a marine fuel. For the past few months, Total has been very active in that direction," Patrick Pouyanné, Chairman and CEO of Total, said.



Vessel refuels with LNG in Singapore

FUELLING NEWS AGENDA

VESSEL DESIGN

MAN to equip world's first LNG trawler **2**

ROAD LOGISTICS

Lidl, Krummen Kerzers plan Swiss LNG fleet **3**



NORDICS

Gothenburg renews and extends LNG tariff discount **5**

TECHNOLOGY

Kosan Crisplant launches multi-trailer LNG bunker connector **6**

INDIA

India makes move toward LNG fuelling infrastructure for major highways **8**

FERRIES

ABS classes LNG BC ferry **9**

BIO-LNG

Skargas completes biogas bunkering first **11**

SOUTH KOREA

KOGAS to boost LNG bunkering capacity **12**



RESEARCH

NYK, Japan Marine unveil LNG-fuelled bulk carrier concept **13**

LNG ORDERBOOK

LNG-fuelled confirmed newbuilds **15**

LNG-fuelled ship fleet **16**

LNG small scale fleet **18**

MAN to equip first LNG-powered fishing trawler

Swedish engine manufacturer MAN Diesel & Turbo is to supply propulsion systems for the world's first LNG-fuelled fishing trawler.

The newbuild purse-seiner vessel *Libas* will be built by Cemre Shipyard in Istanbul on behalf of Norwegian fishing group, Liegruppen. Alongside propulsion via MAN's 6L51/60DF main engine the boat will also feature cryogenic fuel system and storage from MAN.

"This is a very noteworthy win. Our ability to provide this efficient, low-emission, proven LNG-fuelled propulsion package - a world's first for this environmen-

tally sensitive segment - really puts our credentials as a system provider on display," Lex Nijssen, Head of Four-Stroke Marine at MAN Diesel & Turbo, said.

Fishing sector demand building

The demand for LNG-powered vessels in the fishing sector remains unproven but ahead of strict emissions regulations from the International Maritime Organization

(IMO), scheduled to enter force in January 2020, investment in alternative fuel sources from the industry is expected to rise.

"This is a pioneering project. At MAN we are convinced that low-emission gas fuels are the silver bullet to decarbonising the shipping industry and we have made it our mission to guide our customers through that transition," Wayne Jones, Chief Sales Officer with MAN Diesel & Turbo, said.

The vessel specification includes a Renk gearbox, MAN Alpha propeller system and MAN Cryo LNG fuel-gas system supported by a 350 cubic-metre-capacity tank.

MAN Maritime Energy Transition

The new LNG-propulsion package

will be delivered as part of MAN's Maritime Energy Transition initiative to bolster LNG as a shipping fuel, which calls natural gases "the fuels of choice in global shipping" in support of the goal of a climate-neutral shipping industry.

Work on the cryogenic fuel system will be completed by subsidiary MAN Cryo. Based in Gothenburg, Sweden, develops and manufactures a range of cryogenic equipment for the storage, distribution and handling of LNG.

"We offer a full system approach with regards to gas propulsion... This includes new builds as much as retrofits of existing vessels. In 2017 MAN has retrofitted the world's first container vessel to LNG and more projects are being realised as we speak," Nijssen added. ■



Illustration of LNG-fuelled *Libas* by Salt Ship Design

Japan to launch first LNG bunker vessel in 2020

A consortium of Japanese shipping and engineering companies has announced that the first LNG bunkering vessel in the country is expected to start operation in 2020.

The consortium, which includes Kawasaki Kisen Kaisha, Chubu Electric Power, Toyota Tsusho Corporation and Nippon Yusen Kabushiki Kaisha, released specifications for the vessel at the same time as announcing the order.

"The four companies jointly established CLS and Central LNG Marine Fuel Japan Corporation in May of this year to launch the LNG Bunkering Business in the Chubu (central) region of Japan," a spokesperson for NYK said.

Delivery Q3 2018

Scheduled for launch around "September to December 2020" the vessel will feature an LNG cargo tank capacity of 3,500 cubic metres

and gross tonnage of 4,100 tonnes.

Measuring 81.7 metres in length and 18 metres in breadth the vessel will be fabricated at Kawasaki Heavy Industries' shipyard in Japan.

The LBV will be owned and managed by CLS, and LNG will be supplied to end-users through CLMF

Keiretsu explore new LNG infrastructure

The order for the new LNG bunker vessel is the first output from the CLS joint venture but competition in the sector is heating up as Japan's largest companies invest in commercialization of LNG as a transport fuel.

Fellow Japanese shipping firm



Image of proposed LNG bunker vessel

Mitsui O.S.K. Lines (MOL) has been one such major pushing LNG fuel and recently announced a deal with Kanagawa Dockyard to construct the first LNG-fuelled tugboat to operate in Osaka Bay, Japan as part of ongoing research to establish LNG as a fuel of choice in the country.

"LNG is expected to become

an important alternative to heavy fuel oil, because of its relatively low emissions of air-polluting substances and greenhouse gases... The group hopes that the use of LNG will enable their ships to meet increasingly stringent international regulations on emissions," the members of CLS said in a joint statement. ■

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Lidl, Krummen Kerzers plan Swiss LNG fleet

Supermarket group Lidl has announced plans to move its logistics operations in Switzerland from diesel to LNG fuel.

The group is partnering with transport and logistics provider Krummen Kerzers to switch its fleet to LNG operation, via the introduction of the first LNG-fuelled vehicles and filling stations in Switzerland.

"LNG vehicles are a useful bridge solution for a more sustainable future... Yet despite market readiness and deployment in the surrounding European countries, there is still no LNG infrastructure in Switzerland and therefore no LNG vehicles," a spokesperson for Lidl said.

First Swiss LNG filling station in 2019

To remedy this situation Lidl and Krummen Kerzers plan to build new LNG fuelling infrastructure across the country and have already announced plans to open the first LNG refuelling station to the public within 12 months.

"Thanks to the active support of Lidl Switzerland, we can already put our vision into practice in the first half of 2019. We will commission Switzerland's first LNG vehicles and thereby significantly reduce CO2 emissions and air pollutants," Peter Krummen, CEO of Krummen Kerzers, commented.

The development of public LNG infrastructure in Switzerland is not only expected to strengthen uptake in the country but also throughout Central Europe extending range for road transport providers beyond the current mature markets in Northern Europe.

First project presentation in Weinfelden

Headquartered in Neckarsulm, Germany, Lidl is one of the largest supermarket chains in Europe and operates freight logistics serving over 10,000 stores across Europe and the U.S.

"Until mature technologies for fossil-free logistics exist, we do not want to remain inactive, but use the most appropriate technology and promote it... Such vehicles are cleaner and quieter than diesel vehicles and give us the opportunity to do something for our environment right away," Alessandro Wolf, Chief Operating Officer at Lidl Switzerland, said.

Lidl Switzerland is set to hold the first presentation for the project in Weinfelden in the canton of Thurgau, Switzerland on August 15, 2018. Alongside specialists at Krummen Kerzers, Lidl the presentation will also include input from



Lidl plans to introduce the first LNG vehicles to Switzerland

sustainably business agency Swiss Climate and manufacturer Iveco which will demonstrate its LNG vehicle solutions.

Italian industrial vehicle manufacturer IVECO is one of the

leading developers of LNG trucks in market and its Stralis Euro VI Natural Power trucks forms the largest gas-powered truck fleet of its kind in France for XPO Logistics.

NEWS NUDGES

Consortium targets Tokyo Bay LNG bunkering

Japanese industrial groups Uyenno Transtech, Sumitomo and Yokohama-Kawasaki International Port Corporation have signed a memorandum of understanding to own and operate an LNG bunker barge in the Tokyo Bay area.

The three companies have previously undertaken to research ship-to-ship LNG bunkering with a focus on Yokohama-Kawasaki port.

"About one-fourth of the world's ship fuel use will be switched over to LNG by 2030, producing a global rise in the demand for LNG fuel. At the same time, inadequate LNG bunkering infrastructure is among the reasons that Japan and the rest of Asia lag far behind such leading regions as

Europe and the US in widely adopting LNG as marine fuel," the consortium said in a joint statement.

Novatek, KOGAS sign LNG partnership

Russian energy firm Novatek and state-run Korea Gas Corp have signed an LNG cooperation agreement.

The deal will see closer collaboration between the two energy giants with initial focus expected to be on increased partnership in Novatek's Arctic LNG project.

The agreement was concluded following talks between Russian President Vladimir Putin and South Korea's, Moon Jae-in, suggesting that the two countries may be strengthening political as well as commercial ties in the space of LNG.



Lidl supermarket

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Zhang Jia-Hua

Operations Team Leader

Baotou Lu Ding Natural Gas Co. Ltd.

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Gothenburg renews and extends LNG tariff discount

The Gothenburg Port Authority has renewed and extended its tariff discounts for LNG, incentivising uptake of the fuel for operators at the port.

The GPA initiated a 10 per cent discount on the port tariff in 2015 and since then has reported a “positive impact” with reduced emissions of sulphur dioxide, particles and nitric oxide in western Sweden. As a result, vessels that run on LNG receive an extra discount of 20 per cent each time they call.

“A catalyst was necessary to

break the deadlock, and the energy discount has been a strong contributing factor behind many players choosing to follow the LNG route,” Edvard Molitor, Environmental Manager at the GPA, said.

Tariff phase-out in 2020

The LNG discount was due to run to the end of this year but will now run in 2019 before being

phased out during 2020 with a reduction to 10 per cent when the Port Authority will focus on developing the regular indexed environmental discount, which takes greater account of the vessels’ environmental impact rather than the technology or the fuel used to run the vessel.

“We will of course continue to support vessels that offer a good environmental profile, but we won’t make any distinction in the discount between vessels that produce the same environmental outcomes. As the environmental effects of LNG operation continue to be good, these will also be incorporated into our future environmental control system,” Molitor commented.

GPA posts record LNG calls

The port of Gothenburg is the

largest port in the Nordic region, handling approximately 30 per cent of Swedish foreign trade and operating multi-modal transport to the rest of Scandinavia, making it a major driver for LNG uptake in the region.

The GPA reports a sharp increase in LNG calls with zero in 2015, 16 in 2016, 11 last year and 135 projected for full year 2018.

“It took time before it really took off, but today these players are at the LNG forefront at the Port of Gothenburg. Now that the discount period is drawing to a close, we can see that the upward trend is continuing at the port with a growing number of LNG calls. We aim to maintain our support for this development, and we are therefore planning to extend the four-year discount period by a further two years,” Molitor added. ■



Ship-to-ship bunkering at the port of Gothenburg

NaturGass to supply LNG for Gothenburg Port facility

Rising demand for LNG at the port of Gothenburg is set to drive diversification of supply as specialist Swedegas has announced a supply deal with Norwegian gas supplier Barents NaturGass for new LNG bunkering infrastructure at the port.

LNG fuel is currently supplied to the port by gas specialist Skangas, which is also working with Swedish gas transmission network operator Swedegas on construction of permanent LNG facility at the Port of Gothenburg Energy Port.

“With the Swedegas facility, the port will have more LNG choices than previously on a competitive market with several gas suppliers, whilst at the same time there will be a larger range of bunkering methods. This will offer greater flexibility, more stable access, and better service for LNG purchasers,” Jill Söderwall, Head of Commercial Operations at the Energy Port, said.

SIMOPS bunkering from August

The new Swedegas facility is

scheduled to open in August this year and will feature three bunkering alternatives: ship-to-ship, direct from road truck, and pipe-to-jetty, with all three methods capable of being deployed whilst vessels are loading or unloading.

“We can see that the demand for LNG will increase at the Port of Gothenburg, and it is vital that the number of alternatives continues to grow,” Söderwall added.

LNG fuel for the new Swedegas facility will be supplied via trailers or tank containers and gas will then be distributed via a pipeline to the vessels at the quayside.

Swedegas eyes LBG future

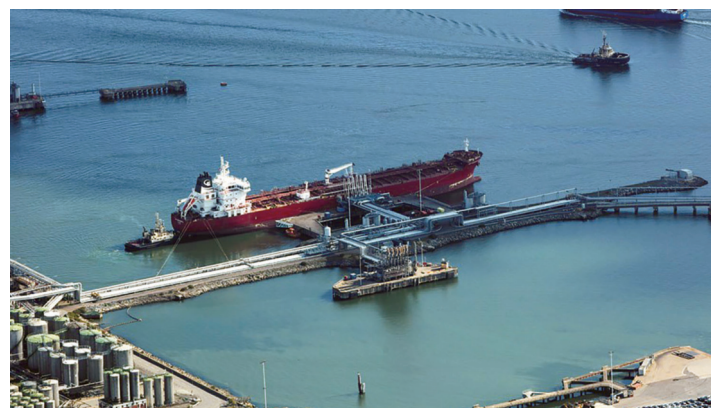
The facility is scalable and can be expanded to meet the needs of the

market. It also has the capability to receive liquefied biogas (LBG).

“We always build infrastructure that can handle both natural gas and renewable gas. It must be simple for shipping to gradually increase the mix of renewable gas as the transition progresses,” said Johan Zettergren, Swedegas chief

executive, commented.

Swedegas owns the gas transmission network from Dragør in Denmark to Stenungsund in Sweden and is in the process of developing new infrastructure for biogas, hydrogen gas and LNG throughout the 33 municipal areas it currently supplies with gas. ■



LNG bunkering at berth 519, Port of Gothenburg

Kosan Crisplant launches multi-trailer LNG bunker connector

Danish gas specialist Kosan Crisplant has introduced a new Y-piece LNG bunker connector, designed to reduce truck-to-ship bunkering time by half.

The Y-piece connector allows two tank trailers to connect to a vessel at the same time and can be expanded to fit four trailers through connection of an additional unit.

"The Y-piece fits any trailer design and allows you to disconnect and switch out tank trailers without stopping the bunkering process. Its compact design and light weight means that you can move it around without the need for special equipment. In fact, just two crewmembers should be able to lift it by hand," a spokesperson for Nijman said.

The connector system can deliver continuous flow of 40 to 120 cubic meters per hour via trailer switching and its compact design and weight requires only two operators on site. The trailer design

also features shut-off valves and a purging system allowing for disconnection and change-over of trailers during the filling operation.

First sale to Zeetank International Logistic

Kosan Crisplant has already sold the first units to Nijman / Zeetank International Logistic Group in the Netherlands and now expects to target sales worldwide following successful piloting of the system by Nijman.

"KC LNG's Y-piece has been a game changer for us. It has drastically increased the efficiency of our LNG bunkering process, and it was very easy to install and use. We have already performed several bunker operations and are quickly accustomed to working



Kosan-Crisplant Y piece connector

easily and safely with the new equipment," a spokesperson for Zeetank International Logistic said.

Headquartered in Aarhus, Denmark, Kosan Crisplant is part of Makeen Energy owned by Saudi industrial group Al-Ayuni Group for Investment & Construction.

Localised strategy pays dividends

With a background in liquefied petroleum gas, Kosan Crisplant supplies and manufactures equipment, plants and systems for filling and maintenance of gas cylinders and offers after-sales and engineering services, facility

management, and supply of components for industry.

Makeen recently announced record turnover for 2017 of a turnover of EUR 136 million, citing a common strategy to provide customers local presence around the globe.

"We are proud of the great results for 2017, but especially of how they were achieved. Some years ago, we asked our customers how we could strengthen the co-operation, and most of all they wanted nearness. Today, we are present across the world, and this strategy clearly yields results," Anders C. Anderson, CEO of Makeen and Kosan Crisplant said. ■



KC LNG's Y-piece has been a game changer for us. It has drastically increased the efficiency of our LNG bunkering process

-spokesperson for Zeetank International Logistic



The connector allows dual tanker refuelling

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Consortium Plans Indian LNG Fuelling Stations

A consortium of Indian energy companies has committed to introduce almost 20 LNG fuelling stations in the country by next year to support heavy-goods transport growth.

The proposed network of LNG re-fuelling stations will be developed by state-run energy firm Petronet LNG, Indian Oil Corporation and BPCL along with local partners and Petronet has already put initial work for the project already out to tender.

The firms aim to begin by piloting 5,000 LNG-fuelled trucks on five leading national highways.

"Following its successful experiment, this exercise would have a repeat in subsequent year of 2020 for another estimated 5,000 trucks that can run on national highways on LNG with a fuel cost saving of nearly 25 percent as well effectively addressing the issue of fuel

pollution," V. K. Mishra, director of Finance at Petronet LNG, said.

Leading Indian automotive manufacturers Tata and Mahindra are also now reportedly exploring opportunities to produce more LNG-fuelled heavy transport vehicles as well as buses.

LNG imports to fuel transport boom

Backing for these new LNG stations is closely tied with wider governmental strategy to upscale LNG imports in the country and drive adoption of the fuel for transport.

Ambitious plans were outlined earlier this year by Narendra



Petronet LNG storage hub

Taneja, spokesman for the ruling Bharatiya Janata Party, to triple LNG imports to 70 million tonnes per year and add 11 import terminals over the next seven years.

Ministry of Shipping plans LNG-fuelled barge fleet

Capitalising on the projected growth in LNG supply, the country's Ministry of Shipping plans to launch a fleet of LNG-fuelled barges and associated infrastructure on the Ganges by the end of this year

"The agencies responsible for

framing and enforcing regulations related to the navigation of LNG Barges have been asked to study best practices and regulations on the subject for implementation in India," a shipping ministry spokesperson said, adding that LNG barges "offer immense opportunities in transportation"

To achieve this and a Memorandum of Understanding (MOU) signed between Inland Waterways Authority of India (IWAI) and Petronet LNG is expected to pave the way for widespread use of LNG as a transport fuel on India's National Waterways.



The Indian government plans to deploy LNG barges on the Ganges

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ABS classes LNG-fuelled BC ferry

Standards agency American Bureau of Shipping (ABS) has classed the newly converted LNG-fuelled ferry, *Spirit of British Columbia*.

The ferry recently re-entered operation for BC Ferries of Canada, following conversion work carried out at the Remontowa Ship Repair Yard in Gdansk, Poland.

Mark Wilson, Vice President of Strategy at BC Ferries welcomed the return of the vessel to the fleet, hailing “the environmental benefits and efficiency advantages that come with its conversion”

“We worked closely with ABS who helped us navigate the technical compliance challenges of converting existing vessels to run on LNG and played a key role in bringing this project to fruition,” Wilson added.

LNG fleet expands in Pacific Northwest

The *Spirit of British Columbia*'s sister vessel - *Spirit of Vancouver Island* - is also set to be converted to LNG operation and scheduled to

enter operation by the spring of 2019.

“With the increased pressure for environmental compliance, LNG as fuel is a practical option for many marine owners and operators... The conversion of these vessels to operate on LNG is an important milestone for BC Ferries and the region, supporting more efficient and environmentally-friendly transportation,” Patrick Janssens, ABS Vice President for Global Gas Solutions, commented.

The identical vessels are the largest ships in the BC Ferries fleet with a capacity to carry 2,100 passengers and crew and 358 automobile equivalent units.

BC government targets LNG fuelling investment

The investment in LNG ferries follows an announcement by the government of British Columbia that



The ABS-classed *Spirit of British Columbia*

it aims to support a range of new LNG infrastructure projects across the region. The strategy includes plans to create incentives for gas utilities to invest in LNG bunker projects and for shipping companies to convert vessels to run on LNG.

“We’re working with utilities to stimulate the use of LNG as a marine fuel in large, ocean-going

ships, and to increase the supply and use of renewable natural gas,” Bill Bennett, Energy and Mines Minister, said.

The Ministry will also seek to boost investment via the Amendments to the Greenhouse Gas Reduction Regulation (GGRR) under the Clean Energy Act to encourage utilities to provide incentives for shipping companies. ■

Carnival orders LNG-fuelled cruise ships from Fincantieri

Italian shipbuilding company Fincantieri has signed a memorandum of understanding with cruise line Carnival Corporation for the construction of two next-generation LNG-fuelled cruise ships.

The giant 175,000-tonne vessels will be capable of accommodating approximately 4,300 guests and will be operated by Carnival subsidiary Princess Cruises.

“This revolutionary platform for next-generation, LNG-powered cruise ships will introduce innovative design and leisure experiences driven by the future

vacation and lifestyle trends of our guests - further evolving the already best-in-class Princess Cruises experience we deliver today,” Jan Swartz, President of Princess Cruises, said.

The first of the two vessels is scheduled for delivery in Monfalcone, northern Italy in late 2023 with the second following

in spring 2025.

Fincantieri exceeds €32 billion backlog

The newbuilds are part of a growing backlog of orders for LNG-fuelled vessels booked by Fincantieri, which recently reported record first half profits of €39 million and a total order portfolio of 109 vessels in July, exceeding €32 billion.

“We are getting ready to enter, together, into a new era of our industry, increasingly aimed at reducing environmental impact. We proudly do this with an all-time record project, both in terms of size and technological level,” Giuseppe Bono, CEO of Fincantieri, said.

Carnival hails LNG best for emissions

The new vessels will form a

cornerstone of Carnival’s strategy to move to LNG as a fuel of choice for its fleet. Last year, the firm signed a two-year supply deal with energy major Shell for two cruise ships.

“We are looking at technology for the future... LNG has the best emissions profile of any fossil fuel and meets and exceeds all current requirements and those in the foreseeable future,” Tom Strang, senior vice-president for maritime affairs at Carnival, said.

The agreement will see Shell NA LNG supply fuel for the two new ships expected to launch by Carnival Cruise Line in 2020 and 2022. They will be homeported in North America and fuelled by Shell’s ocean-going LNG Bunker Barge (LBB) designed to support growing cruise line demand for LNG along the southern U.S. East Coast. ■



Carnival cruise ship

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Skangas completes biogas bunkering first

Norwegian LNG specialist Skangas and shipping line Furetank have completed the first refuelling operations for the dual-fuel vessel *Fure Vinga* using Liquefied Biogas (LBG).

The bunkering operation was carried out in Gothenburg, Sweden, with the LBG fuel transferred directly from a tanker truck to the ship.

“Running vessels on liquefied natural gas is our contribution to a more environmentally friendly environment. We will, however, contribute by increasing the sustainability. Using liquefied biogas was a natural step in this direction,” Lars Höglund, CEO of Furetank, said.

LBG “similar or better” compared to LNG

Skangas delivered the fuel for the operation from its parent company Gasum’s biogas facility in Lidköping and hailed LBG as having “similar or better characteristics” compared with LNG for operation.

“This is the first time we are supplying LBG to a marine customer. However, it will not be the last... To be increasingly greener with the renewable biogas is possible because we use the same infrastructure that we’ve built throughout northern Europe. This means that LNG and LBG will continue to walk hand in hand as the availability of LBG on the market is on the rise,” Tommy Mattila, sales and marketing director in Skangas, said.

Formed from 100% local feedstocks through the processing of various types of organic waste, the gas is purified and upgraded to approximately 97% methane.

“Because the LNG and LBG mainly consist of methane gas the existing LNG supply infrastructure can be used without any modifications. This means that you use the same trucks, ships, tanks and marine filling stations for both products,” a spokesperson for Skangas said.

LBG clear option for Furetank

The *Fure Vinga* was delivered in April this year and is one of two



Fure Vinga refuels with liquefied biogas

sister dual-fuel vessels that Furetank operates in the Nordic region, alongside the *Fure West*. The firm has announced plans to build five further sister vessels

“No doubt LBG will be a clear option for us. It is proven by this operation that it can be available from our existing LNG supplier and not at least with the same quality as our current LNG fuel”, Höglund added.

Skangas is a joint venture between Finnish natural energy gas expert Gasum, which holds a 70% share, and Norwegian electricity group Lyse Energi, which holds the remaining 30%. The firm is one of the largest LNG suppliers in the Nordic region and provides fuel for shipping, industrial and heavy-duty road transport needs.

Furetank strengthens network in Spain

The refuelling of the *Fure Vinga* in Gothenburg followed closely after its maiden bunkering operations in Europe in May, where it received its first LNG via a truck-to-ship operation at the port of Cartagena, Spain.

The bunkering operation marked a new collaboration for Furetank with Hamburg-based LNG specialist Nauticor and Madrid-based GNF, enlarging the Southern European LNG bunkering network.

“With this type of co-operation, it is evident that the use of LNG as a marine fuel is an economic, real and available solution for shipping companies, guaranteeing supply in ports of different areas”, Joaquin Mendiluce, GNF general manager said. ■



The *Fure Vinga*

NEWS NUDGES

Eagle LNG officially opens Maxville LNG facility

Fuel specialist Eagle LNG has officially opened its Maxville LNG Facility in Jacksonville, Florida.

The plant has production capacity of 200,000 gallons of LNG per day with a 1 million-gallon storage tank. The facility has been built to supply Eagle LNG’s Marine Fuel Depot at the Port of Jacksonville’s Talleyrand Marine Terminal.

“It represents the start of Eagle LNG’s plans to build LNG infrastructure across the nation. Eagle LNG is investing millions of dollars creating small-scale LNG infrastructure to supply LNG as a cleaner-burning, more economical fuel alternative for marine bunkering and for export to the Caribbean,” Sean Lalani, President of Eagle LNG, said.

Based in Houston, Texas, Eagle LNG Partners is a wholly owned subsidiary of Ferus Natural Gas Fuels and privately held by The Energy & Minerals Group. ■

KOGAS to boost LNG bunkering capacity

Natural gas specialist Korea Gas Corporation (KOGAS) has announced plans to improve its LNG bunkering capacity via a series of partnerships with global bunkering firms.

The energy firm has announced it will pursue partnerships with bunkering companies Shell and Mitsui amongst others and the commitment is expected to add further support for a shift to LNG fuel in the country's maritime sector, spurring growth at existing LNG bunker terminals at Pyeongtaek and Tongyeong.

"Amid enhanced regulations of fossil fuels, the world is looking at fierce competition to explore sustainable energy sources and relevant technologies... Through LNG

bunkering, KOGAS will preemptively respond to the rapidly changing environmental issues," a KOGAS spokesperson said.

As the sole provider of LNG to South Korea and the largest LNG-importing company in the world, KOGAS is well-placed to take advantage of the fuel, with about 25 million tons imported annually.

Government support for KOGAS infrastructure

Part-owned by the South Korean government, the firm is at the

forefront of manifold plans to develop LNG infrastructure in the peninsula, including multi-million-dollar investment to develop new LNG bunkering at Tongyeong, in

South Gyeongsang Province.

"We will develop 'LNG bunkering system customized for coastal vessels' that is suitable for domestic small-sized coastal bunker bunkering... In addition, it will support localisation development of LNG bunker equipment such as pumps, cryogenic hoses, etc., and establish LNG bunker equipment test evaluation and certification system to support commercialisation after technology development," the government states.

Singapore knowledge-sharing initiative

Alongside investment on the ground, KOGAS will also spearhead efforts to localise expertise in LNG bunkering via increased knowledge sharing with regional authorities. A joint venture with LNG specialists in Singapore is also being explored, with Kim Young-chun, minister of Maritime Affairs and

Fisheries calling the project key to a "new breakthrough in the maritime industry" for the LNG-related industry.

"[South Korea will] establish a cooperative system to share policy know-how with Singapore, which is leading the international LNG network, and lead the international LNG bunkering network to develop international joint LNG bunkering standards and procedures and emergency manual reports," a government official commented.

Headquartered in Seoul, KOGAS currently imports from multiple countries around the world, including Indonesia, Malaysia, Myanmar, Oman, Qatar, and Russia. The firm is working with government to support seven R&D projects developing core LNG technologies related to propulsion, in areas such as control systems and design optimization. ■



KOGAS worker prepares LNG bunkering facility

South Korea to 'revitalise' LNG shipbuilding

The government of South Korea plans to introduce new legislation to 'revitalise' LNG-related shipbuilding in the country.

Shipyards in South Korea have stumbled in recent years, having fallen from a peak at the last decade when the country's shipbuilding sector was the largest in the world. To counter this decline, the Ministry of Oceans and Fisheries called for greater support for shipyards building LNG-fuelled vessels.

"We will support business feasibility studies and international co-operation in order to facilitate the pilot project of introducing LNG-powered vessels under consideration by major ship owners such as POSCO and Southeast Power," a government official said.

LNG bunkering to "increase significantly"

To achieve the required growth in newbuilding orders, the government will revise key national regu-

lations such as the Urban Gas Business Act and the Port Transport Business Act and is in the process of drawing up a long-term roadmap for LNG bunkering infrastructure at major ports including Busan Port and Ulsan Port.

Speaking at the 7th Ministerial Meeting on Economic Relations at Seoul Metropolitan Government Building a Ministry of Oceans and Fisheries official stated that the number of vessels using LNG as a bunker fuel should "increase significantly".

"Currently under review, two 200,000-ton bulk carriers are scheduled to operate on Korean and Australian routes... In the private sector, we will also promote the first domestic LNG-powered offshore vessel to be ordered by August this year," the Ministry of



South Korean shipyards will support increased construction of LNG vessels

Oceans and Fisheries states.

2025 goal for market dominance

Following the 2008 crisis, nearly all the major shipbuilders in the country were hit with billion-dollar losses or bankruptcy, but the government now aims to recover South Korean shipyards' market share of newbuild LNG-powered vessels back to 70 percent globally, from the current 60 percent, by the year 2025.

"Korea can become a global shipbuilding leader once again. The vision of becoming a global shipbuilder is a national task that we cannot give up," President Moon said.

The revision of IGF Code related to the LNG-powered vessels is also expected to play a major role in demand for South Korean shipbuilding, with initiatives such as a push to introduce POSCO's high-manganese steel product supporting local expertise. ■

NYK, Japan Marine unveil LNG-fuelled bulk carrier concept

Shipping line Nippon Yusen Kabushiki Kaisha (NYK) and shipbuilder Japan Marine United Corporation (JMU) have completed concept designs for a new LNG-fuelled bulk carrier.

The 200,000 deadweight-tonne vessel is based on an existing heavy-oil-fuelled bulk carrier design by JMU and has already passed inspection by ClassNK and obtained approval in principle (AiP).

“The use of LNG as a main fuel can reduce the emission of greenhouse gases (GHG) such as CO₂ by approximately 30 percent in comparison to a bulk carrier of the same size using conventional heavy oil,” a spokesperson for NYK said.

Phase 3 emission reductions

Significant improvements in the vessels emission profile mean its Energy Efficient Design Index (EEDI) is reduced by about 40%, exceeding Phase 0 to achieve Phase 3 reduction of 30%.

“NYK and JMU can now begin negotiations with customers for large LNG-fuelled vessels capable of reducing environmental loads... NYK and JMU will continue to con-

tribute to a sustainable society through the provision and operation of eco-friendly ships, making use of technologies to reduce environmental loads,” an NYK representative commented.

Improved cargo-hold volume

The novel design also achieves greater efficiency via space utilization below deck thanks to its configuration of storage and propulsion equipment.

“The arrangement of the LNG-fuel tank and the LNG-fuel supply-system equipment allows the ship to increase its cargo-hold volume and reduce fuel consumption in comparison to a conventional bulk carrier of the same size, despite the weight increase caused by additional equipment,” NYK notes.

NYK is one of the world’s largest shipping companies and provides worldwide transport of project cargo, heavy lift cargo, steel and bulk cargo, alongside its larger container shipping services.



NYK and JMU representatives receive the certification document

Earlier this year it partnered with fellow Japanese shipping lines K Line, Chubu Electric and Toyota Tsusho, to create a joint LNG bunkering business.

“LNG is expected to become an important alternative to heavy fuel oil, because of its relatively low emissions of air-polluting substances and greenhouse gases... The group hopes that the use of LNG will enable their ships to meet increasingly stringent international regulations on emissions,” the shipping firms said in a joint statement. ■

NEWS NUDGES

GTT posts record profit on strong LNG market growth

LNG containment system specialist GTT has announced a record 11.9% increase in revenue for the first six months of 2018, driven by strong demand for its LNG fuelling systems. The firm reported revenues totalling 127.2 million euros during the first half of the year compared to 113.7 million euros in the same period last year.

“The first half of 2018 was characterized by the growth in the LNG market, with a very satisfying number of orders for LNG carriers, which confirms the trends that began last year,” Philippe Berterottière, chairman and CEO of GTT, said.

GTT declared 25 deliveries completed in the first half, of which 24 were LNG carriers and one FSRU. The firm’s order book at the end of the half year stood at 84 units with 66 LNG carriers, 13 FSRUs, 2 FLNGs, 2 onshore storage tanks and one barge. ■



Artist's rendition of LNG-fuelled bulk carrier

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WORLD LNG-FUELLED CONFIRMED NEWBUILDS

Year	Type of Vessel	Owner	Class
2017	Car/passenger ferry	Society of Quebec ferries	LR
2017	Car/passenger ferry	Society of Quebec ferries	LR
2017	Tug	Drydocks World	
2017	PSV	Siem Offshore	DNV GL
2017	Gas carrier	Evergas	BV
2017	PSV	Siem Offshore	DNV GL
2017*	Ro-Ro	TOTE Shipholdings	ABS
2017	Car/passenger ferry	BC Ferries	LR
2017	Gas carrier	Ocean Yield	DNV GL
2017	Gas carrier	Ocean Yield	DNV GL
2017	Gas carrier	Ocean Yield	DNV GL
2017	Gas carrier	Navigator Gas	ABS
2017	Dredger	DEME	BV
2017	Dredger	DEME	BV
2017*	Container ship	Wessels Reederei	BV
2017	Hopper Barge	Bremenports	DNV GL
2017	HSLC	Fred. Olsen	DNV GL
2017	PSV	Harvey Gulf Int.	ABS
2017	PSV	Harvey Gulf Int.	ABS
2017	Cable layer	DEME Tideway	DNV GL
2017	Gas carrier	Evergas	BV
2017	Gas carrier	Evergas	BV
2017	Tug	Østensjø Rederi	
2017	Tug	Østensjø Rederi	
2017	Tug	Østensjø Rederi	
2017*	Car/passenger ferry	BC ferries	ABS
2017	RoPax	Rederi AB Gotland	DNV GL
2017	Car/passenger ferry	Caronte & Tourist	RINA
2017	Oil/chemical tanker	Groupe Desgagnés	BV
2017	Oil/chemical tanker	Groupe Desgagnés	BV
2017	Oil/chemical tanker	Groupe Desgagnés	BV
2017	Oil/chemical tanker	Groupe Desgagnés	BV
2017	Car/passenger ferry	BC Ferries	LR
2017	Oil/chemical tanker	Terntank	BV
2017	Container ship	Crowley Maritime Corp.	DNV GL
2017	Container ship	Crowley Maritime Corp.	DNV GL
2017	RoPax	Tallink	BV
2017	Container ship	Brodosplit	DNV GL
2018	Container ship	Brodosplit	DNV GL
2018	Bulk ship	ESL Shipping	DNV GL
2018	Bulk ship	ESL Shipping	DNV GL
2018	Tug	Keppel Smit Towage	ABS
2018	Tug	Maju Maritime	ABS
2018*	Car/passenger ferry	BC ferries	ABS
2018	PSV	Harvey Gulf Int.	ABS
2018	Container ship	Brodosplit	DNV GL
2018	Container ship	Brodosplit	DNV GL
2018	Car/passenger ferry	Royal Doeksen	LR
2018	Car/passenger ferry	Royal Doeksen	LR
2018	Car/passenger ferry	CHFS	LR
2018	Car/passenger ferry	CHFS	LR
2018*	Ro-Ro	TOTE Shipholdings	ABS
2018	RoPax	Rederi AB Gotland	DNV GL
2018	General cargo ship	Nordnorsk Shipping	DNV GL
2018	Container ship	Containerships	ABS

Year	Type of Vessel	Owner	Class
2018	Container ship	Containerships	ABS
2018	Container ship	GNS Shipping	ABS
2018	Container ship	GNS Shipping	ABS
2018	Container ship	GNS Shipping	ABS
2018	Container ship	GNS Shipping	ABS
2018	Heavy lift vessel	Heerema Offshore	LR
2018	Oil/chemical tanker	Furetank Rederi	BV
2018	Oil/chemical tanker	Furetank Rederi	BV
2018	Oil/chemical tanker	Furetank Rederi	BV
2018	Dredger	DEME	BV
2018	Bulk ship	POSCO	KR
2018	Dredger	van der Kamp	DNV GL
2018	Car/passenger ferry	Torghatten	
2018	Car/passenger ferry	Torghatten	
2018	Car/passenger ferry	Torghatten	
2018	Car/passenger ferry	Torghatten	
2019	Car/passenger ferry	Torghatten	
2019	Cruise ship	Carnival Corporation	RINA
2019	Cruise ship	Carnival Corporation	RINA
2019	Oil/chemical tanker	Älvtank	BV
2019	Oil/chemical tanker	Älvtank	BV
2019	Oil/chemical tanker	Thun Tankers	BV
2019	RoPax	Baleària	BV
2019	Car carrier	Siem Car Carriers	
2019	Car carrier	Siem Car Carriers	
2019	Emergency response ship	German Transport Ministry	
2019	Emergency response ship	German Transport Ministry	
2019	RoPax	Brittany Ferries	
2019	RoPax	Baleària	
2019	RoPax	Baleària	
2019	Oil/chemical tanker	Rosneft	
2020	Oil/chemical tanker	Rosneft	
2020	Oil/chemical tanker	Rosneft	
2020	Oil/chemical tanker	Rosneft	
2020	Research ship	German Transport Ministry	
2020	RoPax	Viking Line	
2020	Cruise ship	Carnival Corporation	RINA
2020	Cruise ship	Carnival Corporation	
2021	Cruise ship	Carnival Corporation	
2021	Cruise ship	Carnival Corporation	
2022	Cruise ship	Carnival Corporation	RINA
2022	Cruise ship	MSC Cruises	
2022	Cruise ship	RCCL	
2024	Cruise ship	MSC Cruises	
2024	Cruise ship	RCCL	

Excluding LNG carriers and inland waterway vessels. For more information please visit www.dnvgl.com

Data last updated : 15 February 2017

* = conversion projects

LNG-FUELLED SHIPS IN OPERATION WORLDWIDE

Year	Type of Vessel	Owner	Class
2000	Car/passenger ferry	Fjord1	DNV GL
2003	PSV	Simon Møkster	DNV GL
2003	PSV	Eidesvik	DNV GL
2006	Car/passenger ferry	Fjord1	DNV GL
2007	Car/passenger ferry	Fjord1	DNV GL
2007	Car/passenger ferry	Fjord1	DNV GL
2007	Car/passenger ferry	Fjord1	DNV GL
2007	Car/passenger ferry	Fjord1	DNV GL
2008	PSV	Eidesvik Shipping	DNV GL
2009	PSV	Eidesvik Shipping	DNV GL
2009	Car/passenger ferry	Tide Sjø	DNV GL
2009	Car/passenger ferry	Tide Sjø	DNV GL
2009	Car/passenger ferry	Tide Sjø	DNV GL
2009	Patrol vessel	Remøy Management	DNV GL
2009	Car/passenger ferry	Fjord1	DNV GL
2010	Patrol vessel	Remøy Management	DNV GL
2010	Car/passenger ferry	Fjord1	DNV GL
2010	Patrol vessel	Remøy Management	DNV GL
2010	Car/passenger ferry	Fjord1	DNV GL
2010	Car/passenger ferry	Fjord1	DNV GL
2010	Car/passenger ferry	Fosen Namsos Sjø	DNV GL
2011	PSV	DOF	DNV GL
2011*	Oil/chemical tanker	Tarbit Shipping	DNV GL
2011	Car/passenger ferry	Fjord1	DNV GL
2011	PSV	Solstad Rederi	DNV GL
2012*	Car/passenger ferry	Fjord1	DNV GL
2012	PSV	Eidesvik	DNV GL
2012	PSV	Olympic Shipping	DNV GL
2012	PSV	Island Offshore	DNV GL
2012	General Cargo	Nordnorsk Shipping	DNV GL
2012	PSV	Eidesvik Shipping	DNV GL
2012	PSV	Island Offshore	DNV GL
2012	Car/passenger ferry	Torghatten Nord	DNV GL
2012	Car/passenger ferry	Torghatten Nord	DNV GL
2012	Car/passenger ferry	Torghatten Nord	DNV GL
2013	PSV	REM	DNV GL
2013	RoPax	Viking Line	LR
2013	Car/passenger ferry	Torghatten Nord	DNV GL
2013	Tug	Incheon Port Authority	KR
2013	General Cargo	Eidsvaag	DNV GL
2013	RoPax	Fjordline	DNV GL
2013	High speed RoPax	Buquebus	DNV GL
2013	Tug	CNOOC	CCS
2013	Tug	CNOOC	CCS
2013	Car/passenger ferry	Norled	DNV GL
2014	Car/passenger ferry	Norled	DNV GL
2014	Tug	Buksér & Berging	DNV GL
2014	RoPax	Fjordline	DNV GL
2014	Patrol vessel	Finish Border Guard	DNV GL
2014	Tug	Buksér & Berging	DNV GL
2014	Gas carrier	Anthony Veder	BV
2014	Gas carrier	Anthony Veder	BV
2014	PSV	Remøy Shipping	DNV GL
2014	General Cargo	Egil Ulvan Rederi	DNV GL
2014	General Cargo	Egil Ulvan Rederi	DNV GL
2014	PSV	Siem Offshore	DNV GL
2015	PSV	Harvey Gulf Int.	ABS
2015	Ro-Ro	Norlines	DNV GL
2015	Car/passenger ferry	Samsøe municipality	DNV GL
2015	PSV	Simon Møkster Shipping	DNV GL
2015	PSV	Siem Offshore	DNV GL
2015	Ro-Ro	Norlines	DNV GL
2015*	Oil/chemical tanker	Bergen Tankers	LR
2015	Car/passenger ferry	Society of Quebec ferries	LR

For more information please visit www.dnvgl.com

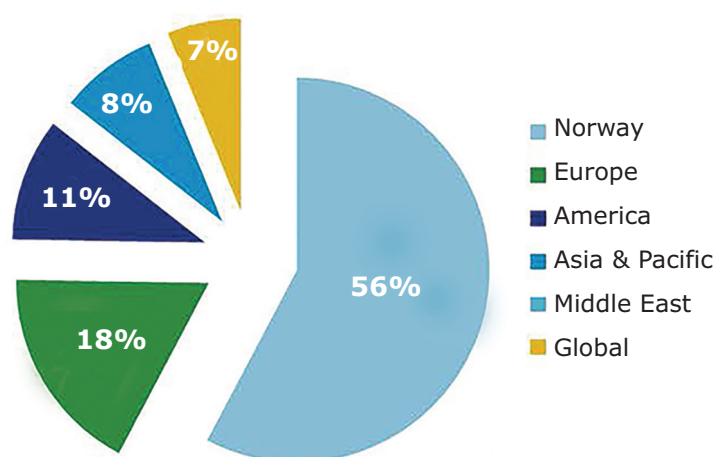
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* = conversion projects

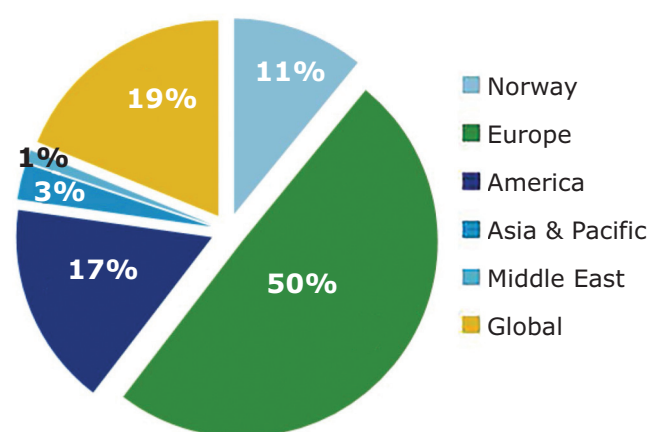
Year	Type of Vessel	Owner	Class
2015	Gas carrier	Evergas	BV
2015	Gas carrier	Evergas	BV
2015	Tug	CNOOC	CCS
2015*	Car/passenger ferry	AG Ems	DNV GL
2015	Tug	NYK	NK
2015	Gas carrier	Chemgas Shipping	BV
2015	Gas carrier	Evergas	BV
2015	PSV	Harvey Gulf Int.	ABS
2015	Container ship	TOTE Shipholdings	ABS
2015	Car/passenger ferry	AG EMS	DNV GL
2015	Bulk ship	Erik Thun	LR
2016	Container ship	TOTE Shipholdings	ABS
2016	Gas carrier	Evergas	BV
2016	PSV	Harvey Gulf Int.	ABS
2016	Bulk ship	Erik Thun	LR
2016	Oil/chemical tanker	Terntank	BV
2016	Gas carrier	Navigator Gas	ABS
2016*	Oil/chemical tanker	Furetank Rederi	BV
2016	Icebreaker	Arctica Shipping	LR
2016	Car/passenger ferry	Boreal Transport Nord	DNV GL
2016	Car/passenger ferry	Boreal Transport Nord	DNV GL
2016	Tug	CNOOC	CCS
2016	Gas carrier	Chemgas Shipping	BV
2016	Car carrier	UECC	LR
2016	Oil/chemical tanker	Terntank	BV
2016	Oil/chemical tanker	Terntank	BV
2016	Car/passenger ferry	BC Ferries	LR
2016	Gas carrier	Evergas	BV
2016	PSV	Siem Offshore	DNV GL
2016	Car/passenger ferry	Seaspan Ferries Corp.	BV
2016	Gas carrier	Navigator Gas	ABS
2016	Ro-Ro	Searoad Holdings	DNV GL
2016	Car carrier	UECC	LR
2017	Gas carrier	Navigator Gas	ABS
2017	Car/passenger ferry	Seaspan Ferries Corp.	BV
2017*	RoPax	Baleària	BV

AREA OF OPERATION OF LNG-FUELLED SHIPS

Operating area
ships in operation



Operating area
confirmed orderbook



Updated 15 February 2017
Excluding LNG carriers and inland waterway vessels

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 / Lucia Ambition	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	Aman Hakata	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	Triputra (ex Surya Satsuma)	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	Norgas Creation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2010	Norgas Innovation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
2011	Norgas Conception	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Norgas Invention	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
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
2014	LNG-Oil combi**	2,000	LNG	Germany	Yes	Veka
2014	Short Sea LNG Tanker **	4,000	LNG	Germany	Yes	Veka
2015	LNG Inland bunker**	800	LNG	Germany	Yes	Veka
2015	LNG bunker barge 1†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 2†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 3†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	10 small carriers TBN**	5,000	LNG			Bimantara Group
2015	Jahre TBN**	6,200	LNG	Norway	Yes	Donsotank/Jahre Marine
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
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	TBN 1	27,500	LNG	China?		Danyang?
2015	TBN 2	27,500	LNG	China?		Danyang?
2015	TBN 3	27,500	LNG	China?		Danyang?
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	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang

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 = 18th July 2018

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Innvovation	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Inspiration	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2016	Navigator Aurora	35,000	Ethane/Ethylene	Markus Hood - Stenungsund	Ethane, for Borealis	Navigator
2016	Gaschem Beluga	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Gaschem Orca	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Ocean Yield TBN**	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2017	Oizmendi	600	LNG	Bilbao	Yes	Itsas Gas
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
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
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	Yuan He 1	30,000	LNG	China	Yes	CSR
2017	Navigator Eclipse	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Nova	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Prominence	35,000	Ethane/Ethylene	US	Ethane	Navigator
2018	CME TBN†	2,200	LNG	US Coast	Yes	CME
2018	Shell Bunker Barge TBN 4	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	Qi Yuan	28,000	LNG	China	Yes	Dalian Inteh Group
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Bunker Breeze	0	LNG	Barcelona	Yes	Suardiaz Energy Shipping
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	KLine TBN	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
2020	Shell Bunker Barge	4,000	LNG	US Coast	Yes	Q-LNG Transport/Harvey Gulf
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Total TBN	18,600	LNG	NWE	Yes	MOL
2020	FuelLNG TBN	7,500	LNG	Singapore	Yes	FuelLNG
2020	CLS TBN	3,500	LNG	Japan	Yes	CLS
2021	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas

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 = 18th July 2018