

LNG Fuelling

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UK's Grain LNG uncorks LNG loading hub

Grain LNG terminal in Kent, UK, publicly opened an LNG tanker truck loading facility on November 11th for distributing LNG to tanker trucks.

UK gas grid operator National Grid's LNG tanker truck loading facility is based at its existing LNG import terminal 43 miles east of London.

The new loading hub allows road tanker operators to load LNG onto trucks for filling LNG tanks at petrol stations. It does not have facilities to directly fuel LNG-fuelled vehicles, but will be used to refill stations used by LNG-fuelled vehicles around the country.

Road tankers will also supply LNG industrial and commercial customers in the UK and Europe.

The terminal operator's continuously open multi-bay facility offers 36 slots for road tankers over a 24 hour period.

The UK-based fuel supplier Gasrec, which assisted National Grid with its initial commissioning process for the logistics hub over two days, is also a customer of the facility.

Gasrec uses the hub to supply its growing national truck refuelling infrastructure from which it fuels over 60 per cent of the UK's natural gas vehicles, said the company.

Break bulk

National Grid has planning permission in place to increase the size of the LNG loading facility, doubling the amount of bays available from two to four, subject to market demand.

Grain LNG said April it is offering a marine LNG reload service to shipping markets, the first time such a service has been offered in the UK.

It said that LNG reloading capability facilitates break bulk capability and complements cooling, road tankering and



Calor tanker truck loading at National Grid's loading station.
Source: National Grid

regasification services.

"The facility doesn't offer bunkering or break bulk services at the moment. It's a service we may consider offering in the future though," confirmed National Grid's corporate press officer David Lavender.

Calor supply deal

The UK-based LPG supplier Calor has secured its role as first customer of the Grain LNG hub.

PrimaLNG, Calor's sister company has signed a commercial agreement with Centrica, to purchase LNG from the hub.

Calor is part of diversified Dutch group SHV Gas Group. Tankers of LNG are also being used to refill Calor's owned LNG refuelling network, which it calls the largest publically accessible LNG road-refuelling network in the UK.

Calor has development plans in place to expand this network further over the coming 18 months.

Simon Culkin, importation terminal manager at Grain LNG,

said: "The launch of this new truck loading facility is a key milestone in the terminal's 10 year history. We are the largest terminal in Europe and the ability to load road tankers is a welcome addition to the many other services we offer here, including the ability to import, store, regasify LNG and both cool down and re-load LNG ships.

"It is a great time to launch a truck loading facility. We are seeing many key government and market signals lining up to drive the adoption for LNG as a fuel, such as tightening emission regulation and the availability of dedicated technologies, together with the huge demand we have had from our customers and road tanker operators.

"There is a significant amount of world-wide LNG available to meet UK and global gas demand. This, together with the inherent environmental benefits of using LNG compared to diesel for example, makes a compelling case for LNG as a fuel."

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City resolves on LNG at Port of Tacoma

The Northwestern US city of Tacoma will undertake improvements ahead of building beginning on utility Puget Sound Energy's \$275 million LNG bunkering facility at the Port of Tacoma.

The city adopted a resolution to work together with the Port of Tacoma to rebuild streets and fire station in preparation for a proposed LNG bunkering location.

Officials also released a draft environmental impact statement (EIS) which recommended building the fire station. It laid the groundwork for upcoming permit decisions by federal, state, and local agencies, said PSE.

PSE hopes to begin construction on an LNG bunkering station before the end of this year, for operation by early 2017.

Also last week PSE made a filing to allow suppliers the option to inject bio-methane into PSE's

distribution system for sale to end-use customers.

Project layout

PSE agreed to supply LNG as marine fuel Totem Ocean's two LNG-powered containerships from its Tacoma location.

The first ship "Isla Bella" was delivered last month and the next ship is due for delivery in early 2016.

Tacoma LNG facility will liquefy the natural gas and transfer it to TOTE's adjacent Marine Vessel LNG fuelling system, bunkering barges in the Hylebos or Blair waterways, or tanker trucks on site.

The LNG project would be constructed on the Blair-Hylebos

Peninsula/Port of Tacoma: 901 and 1001 Alexander Avenue East; 3533 E. 11th Street in Tacoma.

The utility has selected the Port of Tacoma due to its proximity to TOTE Marine and the existing industrial land use of the area.

PSE's LNG facility also includes regasification for stored LNG and gas grid injection during peak demand times. It is upgrading its gas grid with two new pipeline segments about 5 miles each, a new limit station and an upgrade to another station.



Source: Port of Tacoma

Crowley okayed to import LNG into Alaska

Future LNG-fuelled Con-Ro owner and LNG exporter, Crowley Maritime has been granted approval by the US and Canadian energy regulators to import LNG from Canada.

The DOE approval means Crowley's petroleum distribution arm can supply, transport and distribute LNG from Canadian LNG facilities.

The LNG can be distributed via ISO containers on trucks and barges to the state of Alaska and the Northwestern US.

Crowley now holds two-year im-

port and export licenses that allow the company to import up to 2.12 billion cubic feet of LNG. This is in addition to an export license to supply containerised LNG to Non-Free Trade states in the Caribbean, Central and South America.

It has a long-term agenda to secure supply through 25-year

licenses or proposed Alaska LNG supply projects.

Crowley currently operates 22 fuel terminals in western Alaska, offering gasoline, jet fuel, diesel and propane among others. It also offers heavylift and shipping services to oil and gas projects in Alaska.

Its work includes sealifts of large production modules. At the southern terminus of the trans-Alaska oil pipeline, Crowley provides tanker escort and docking services in Valdez Harbor and Prince William Sound for Alyeska Pipeline Service Company's Ship Escort/Response Vessel System.

Another American dual-fuel containership operator, TOTE Maritime, has a subsidiary that operates a shipping services in Alaska.

Logistics

Crowley's logistics team will transport LNG from Canada facilities to customers' storage units, coordinating road transport and shipping via barge to Alaska.

Crowley's Alaska distribution team will then deliver LNG directly to customers' facilities, in order to be re-gasified for power generation, and mining, marine and industrial applications.

Crowley's director of business development, LNG, Matt Sievert, said, "It's exciting for many of our commercial and industrial customers because the availability of LNG has been very limited in the past, and it's another opportunity for us to prove that we're a total solutions provider in the energy and logistics industries."



Crowley will use ISO containers to supply LNG to clients in Alaska. (Source: Crowley)

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Nordic hamburg orders four dual-fuel box ships

Germany's short sea containership owner Nordic Hamburg has ordered four dual-fuel tank container ships from Chinese shipyard Huatai Heavy Industries in Jiangsu Province, Chinese website SoShip reported.

Nordic Hamburg's dual fuelled ships will operate on dual-fuel (LNG and HFO) along a Baltic trade route, according to Dutch consultancy Dynamar BV.

The vessels are set for delivery in 2017, joining Nordic Hamburg's current fleet list of 15 bulk carriers and 9 container ships.

Signing celebrations on November 3rd included executives from Huatai Heavy Industry Zhu Hongbing, class body American Bureau of Shipping and 30 guests.

The latest box ships ordered have a tonnage of 1,400 TEU. The ships dimensions will include a length of 169.95 meters, 26.9 meters wide type, depth 14.85 m, the design draft of 8.5 m, speed 19, and will feature ABS class, said SoShip.

LNG ship backlog

The latest round of dual-fuelled boxships are in addition to a



An illustration of an LNG containership. Source: ABS

6 dual-fuel box ship order placed by GNS Shipping in 2014 which will all be operated by Containerships of Helsinki on delivery next year.

GNS Shipping is a joint venture of Nordic Hamburg and Guoyu Group, a Chinese shipyard and transport company and holding company of Yangzhou Gouyu Shipbuilding.

A steel cutting event for the first two vessels was held at

Yangzhou Guoyu Shipyard in January.

Huatai Heavy Industries in August completed restructuring, having optimised production and established high-end specialty shipbuilding. Huatai Heavy Industries this year delivered three 38,500 tons bulk carriers.

Chinese state two years ago moved to reform shipyards during downturn and overcapacity. ■

Tallink sells ferry to fund dual fuel project

Estonian shipping group Tallink has agreed a sale and charter back for fast ferry, "Superstar" delivered 2008, to finance a new dual-fuel LNG fast ferry.

"Superstar" runs a route from Tallinn in Estonia to Helsinki, Finland and will continue its operations on Tallinn-Helsinki route until the delivery of the new fast ferry.

Tallink Superfast Limited, a subsidiary of the shipping group agreed to sell the vessel to Italy's Medinvest Spa (Corcia Ferries Group) for €91.5 million (\$98.3 million).

It also signed a bareback charter agreement under which Tallink will continue to operate the fast

ferry until the start of 2017.

Change of the ownership and start of the charter period of the fast ferry Superstar is planned in December 2015.

LNG ferry

Tallink ordered a new €230 million LNG powered fast ferry for Tallinn-Helsinki route in February 2015.

The vessel, emissions-compliant for Baltic Sea operation, is being built by Turku Meyer Yard in Finland for delivery in 2017.

The shipping company said, "AS Tallink Grupp will use the cash proceeds from the sale mainly to repay loans to continue the deleveraging strategy and for the down payment of the new LNG fast ferry under construction.

"The Group expects to incur one-off costs from premature termination of the loan contract, related to the sale of the vessel.

Tallink ordered the fast ferry "Superstar" for €120 million from Italian shipyard Fincantieri Cantieri Navali.

The ferry is 175.1 meters long and 27.6 meters wide and has the speed of 27.5 knots. Superstar accommodates up to 2080 passengers and 1930 lane meters of cargo and passenger vehicles. There are 186 cabins and 736 beds on board. ■



Illustration of LNG fast ferry Source: Tallink

NEWS NUDGE

US bunker barge switch

A joint venture of WesPac Midstream and partner Clean Marine Energy owning a 2,200 cubic metre capacity LNG bunker barge, has switched its location of operation, reported TradeWinds. The ship, planned to operate initially in the US city of Tacoma, Washington fuelling TOTE's LNG containerships will now operate on US East Coast, following the sinking of a ship slated for conversion. The LNG barge is due for delivery in July, with operations starting next year.

Crowley builds pier

Crowley Puerto Rico Services has broken ground on a \$48.5-million construction project for a new pier at its Isla Grande Terminal in San Juan, Puerto Rico. The project includes the development of a new 900-foot-long, 114-foot-wide concrete pier needed to accommodate Crowley's two LNG powered ships, which are scheduled for delivery in 2017.

Texas LNG picks Honeywell

US LNG filling station operator Texas LNG has executed a Master Framework Alliance Agreement with engineering company Honeywell to provide gas pre-treatment and automation and control technology. Texas LNG will use Honeywell UOP's Amine Guard FS process to reduce acid gas to very low levels and its proprietary adsorbents to remove water, mercury and sulfur from the natural gas, which is necessary for natural gas liquefaction and LNG transport.

Spain opens LNG fuel course

Spanish gas association Sedigas, Iberian association GASNAM and Spanish transmission and LNG terminal operator Reganosa are offering corporate technicians or university graduates two courses on LNG. They will be held on the premises of the LNG terminal Reganosa Mugaros.

Lithuania and Spain forming LNG bunker rules

Lithuanian state-owned utility Klaipėdos Nafta has partnered on LNG bunkering rules with the Iberian association of natural gas for mobility (GASNAM) ahead of 2017 bunkering start up.

The bodies are looking to develop a standard governing the activities of LNG supply to ships in its various forms: truck-to-ship, port-to-ship and ship-to-ship.

Such a standard is “hitherto non-existent in Europe,” and will rely on the experience of both companies under the terms of the Memorandum of Understanding.

Spain, which has several LNG terminals, has accumulated significant experience, said Klaipėdos Nafta.

LNG bunkering

The Lithuanian company plans to start distribution of LNG as fuel in 2017.

It is operator of Europe’s first floating LNG storage and regasification terminal (FSRU) Höegh-owned “Independence,”

The Lithuanian utility said it has concluded a preliminary supply contract for LNG with JetGas, the only LNG supplier in Estonia, which is interested in selling “LNG as an alternative fuel for the industries around the Baltic countries and to expand LNG regas stations’ network.”

Both entities are also collaborating in the UNECE Working Group of Experts on Gas, D Task Force, coordinated by GASNAM.

GASNAM was created in Spain in 2013, but has since expanded into Portugal, representing the Iberian common interests related to natural gas. ■

Croatian yard starts building LNG container ships

Brodosplit has cut steel on a four dual-fuelled box ship order, with each ship having a capacity of 2,000 TEU.

Though the charterer was not revealed by the yard, ships under construction may possibly include a duo booked in 2013 for a subsidiary of the yard, domestic shipping company Brodosplit-Navigation, based in Split, Croatia.

Brodosplit and Brodosplit Navigation at that time had a contract for two multipurpose LNG-fuelled container vessels, reported Korean Shipping Messenger.

Each of the container vessels now under construction will have a slow speed 2 stroke dual fuel, combination LNG and HFO engine.

Also can use diesel fuel, and in emergency situations has the ability to drive with the cooking oil from food sectors, as well as all other oils or fuels.

Engines will be built in Brodosplit’s diesel engine factory, under the license of German-headquartered MAN Diesel & Turbo.

It will also produce the tanks in



Illustration of vessels. Source: Brodosplit

which the chilled gas will be stored, built according to Germanischer Lloyd recommendations and DNV GL classed.

Ships will be 184.43 meters long, 27.5 meters wide and 15.80 meters high. Their individual deadweight at 10.30 meters draft will be 24 thousand tons.

They will be able to carry 20 feet/6.1 m long containers, reaching 18-knot speed using engines operating at 11060 kW and 100 revolutions per minute.

Brodosplit will have four to five

times lower cost per mile than the other ships of this class, and 30-50 times less will pollute environment, the yard said.

Brodosplit CEO Tomislav Debeljak said, “By building of these ships Shipbuilding Industry Split and Brodosplit-Navigation enter a shipbuilding market niche that will enable sustainable business operation for Split Shipyard, bigger engagement of capacities and acquisition of references for building of ships that will be in higher demand in near future? ■

Rotterdam Port discounts dues for LNG ships

In the port of Rotterdam is rewarding ships that score high on the Environmental Ship Index (ESI) receive a discount on seaport dues already paid, for example LNG-fuelled vessels.

The ESI is an international benchmark for emissions from seagoing vessels. Vessels that perform better than the legal norm, 31 or more, will be rewarded with a 10% discount on port dues.

The discount was extended to 20% when vessels also have low NOx emissions in January and also applies to ships with an individual ESI-NOx score of 31.0 or more.

Low NOx emissions are achieved by using LNG as fuel or large catalysts. The discount applies to each call in the quarter concerned, with a maximum of 20 calls per single ship per quarter.

At the end of each quarter the Port of Rotterdam Authority will determine which vessels are eligible for the ESI discount. Conditions of the discount include at

the actual time of arrival (ATA) in Rotterdam the vessel must have an ESI score of 31 points or more.

The discount for clean vessels is in line with the policy of the Port of Rotterdam Authority on sustainable port development.

When the ESI score is adjusted by the International Association of Ports and Harbours (IAPH) to below 31.0 points, or the ship is granted the status ‘inactive’, all paid out ESI discounts need to be repaid within four weeks upon first request.

For questions about the calculation of the ESI score, please contact the ESI Office of the International Association of Ports and Harbours. ■



Source: Rotterdam Port

Flanders readies for 40,000 natural gas vehicles

Belgian region of Flanders plans to remove road taxes for cars fuelled by natural gas or run on electricity, and registration taxes will also be scrapped. Spain is expected to follow.

Dutch CNG distributor CNG net and Kuwait-and-Europe headquartered petrol station supplier Q8, a trademark of Kuwait Petroleum International, have plans to enter the Flanders market soon, according to the Natural & bio Gas Vehicle Association.

Tax measures benefitting natural gas vehicles were announced by Belgian Energy Minister Annemarie Turtelboom following Volkswagen's admission to using software to bypass emissions tests, reports the NGVA.

Flanders will keep the tax breaks until 2020, by which time it expects to have 100,000 green vehicles on its roads.

Belgium anticipates most of the green vehicles will be electric, but 40,000 the 100,000 will use natural gas, up from 2,000

cars on natural gas at the moment. 40 filling stations are operated by three companies including NGVA.

Taxes on the diesel will be raised in the coming three years, and gasoline taxes are expected to be lowered.

Most cars in Belgium are equipped with diesel engines, about 70 percent.

Taxes are the same for diesel and gasoline, the pump diesel can be 25 percent cheaper per liter. NGVA reports the government is aware of Diesel's poor track record on particulate matter and NOx, particularly of older engines.

Spain has measures to boost the sales of natural gas vehicles in preparation. They are expected to be announced before the end of the year.



Q8 in 2014 opened its first highway site in Luxembourg on the E25 motorway from Luxembourg to Belgium

Ryder System marketing bio-LNG to California

American trucking logistics company Ryder System and filling station supplier Clean Energy Fuels will switch two Ryder stations in Orange and Fontana in the US West Coast state of California to Clean Energy's Redeem brand biomethane fuel.

Biomethane at the stations will be available in both CNG and LNG forms. Ryder said with the deal it will be the only truck logistics company to have on-site CNG and LNG fuels available to the public.

The stations are commercially

available open to both individual and public fleet vehicles, said Clean Energy.

Ryder said with the deal it will be the only truck logistics company to have on-site CNG and LNG fuels available to the public.

Ryder System vice president of supply management, global fuel products, Scott Perry, said, "Our decision to use 100% renewable natural gas is based upon our ongoing commitment to ensuring we are delivering solutions that help our customers reduce greenhouse gas emissions."

Ryder is expected to reduce greenhouse gas emissions by approximately 6,300 metric tons per year using current fuel volumes.

Clean Energy also will be providing fuel station maintenance services at Ryder's natural gas fueling stations in Fontana and Orange.

Clean Energy operates 34 filling station locations, and Ryder has 18 natural gas vehicle maintenance markets.

Clean Energy Renewables president Harrison Clay, said: "After launching Redeem as a commercial fuel just two short years ago, Clean Energy is on track to deliver

over 40 million gallons this year."

"Ryder's leadership to provide Redeem at their two stations in southern California will now expand the benefits of the cleanest fuel to Ryder commercial customers' fleets operating hundreds of additional heavy duty trucks and other vehicles."

Redeem by Clean Energy is a renewable natural gas vehicle fuel, derived from biogenic methane or biogas, which is methane that is naturally generated by the decomposition of organic waste.

The methane gas is then processed, purified and sent into the interstate natural gas pipeline and made available exclusively to Clean Energy customers.

Redeem biomethane vehicle fuel is procured from over 15 biomethane production facilities, including two owned and operated by Clean Energy.



A natural gas filling station Source: Clean Energy Fuels

WORLD LNG-FUELLED SHIP FLEET AND ORDERBOOK

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

For more information please visit www.dnvgl.com

Data last updated = November 6, 2015

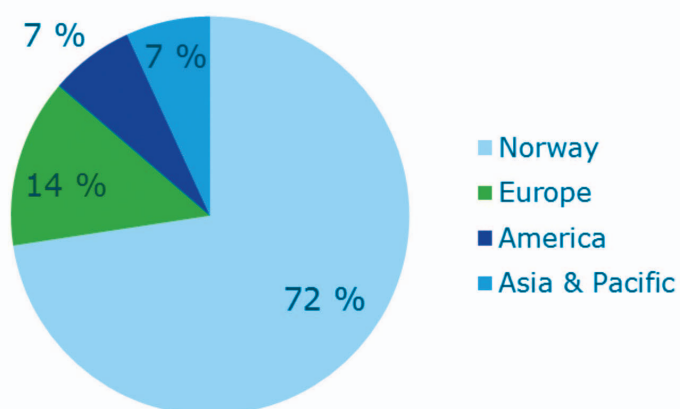
* = retrofit projects

Year	Type of Vessel	Owner	Class
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	Society of Quebec ferries	LR
2015	Car/passenger ferry	Society of Quebec ferries	LR
2015	PSV	Harvey Gulf Int.	ABS
2015	Car/passenger ferry	AG EMS	GL
2015	Tug	CNOOC	CCS
2015	Tug	Drydocks World	
2015	PSV	Harvey Gulf Int.	ABS
2015	PSV	Harvey Gulf Int.	ABS
2015	Bulk ship	Erik Thun	LR
2015	Container ship	Brodosplit	DNV GL
2015	Container ship	Brodosplit	DNV GL
2015	PSV	Siem Offshore	DNV GL
2015	PSV	Siem Offshore	DNV GL
2015*	Oil/chemical tanker	Furetank Rederi	BV
2016	Container ship	TOTE Shipholdings	ABS
2016	Gas carrier	Evergas	BV
2016	Gas carrier	Evergas	BV
2016	Gas carrier	Evergas	BV
2016	PSV	Harvey Gulf Int.	ABS
2016	Icebreaker	Finnish Transport Agency	LR
2016	PSV	Siem Offshore	DNV GL
2016	PSV	Siem Offshore	DNV GL
2016	Gas carrier	Chemgas Shipping	
2016	Oil/chemical tanker	Terntank	BV
2016	Oil/chemical tanker	Terntank	BV
2016	Oil/chemical tanker	Terntank	BV
2016*	Ro-Ro	TOTE Shipholdings	ABS
2016	Car carrier	UECC	LR
2016	Car carrier	UECC	LR
2016	Car/passenger ferry	Boreal	DNV GL
2016	Car/passenger ferry	Boreal	DNV GL
2016	Container ship	GNS Shipping	ABS
2016	Container ship	GNS Shipping	ABS
2016	Ro-Ro	Searoad Holdings	DNV GL
2016	Car/passenger ferry	BC Ferries	LR
2016	Car/passenger ferry	BC Ferries	LR
2016	Gas carrier	Ocean Yield	DNV GL
2016	Gas carrier	Ocean Yield	DNV GL
2016	Gas carrier	Ocean Yield	DNV GL
2016	Car/passenger ferry	Seaspan Ferries Corp.	BV
2016	Car/passenger ferry	Seaspan Ferries Corp.	BV
2016	Gas carrier	Navigator Gas	ABS
2016	Gas carrier	Navigator Gas	ABS
2016	Gas carrier	Navigator Gas	ABS
2016	Gas carrier	Navigator Gas	ABS
2016	Container ship	Brodosplit	DNV GL
2016	Container ship	Brodosplit	DNV GL
2016*	RoPax	Baleària	BV
2016	Dredger	DEME	BV
2016	Dredger	DEME	BV
2016*	Container ship	Wessels Reederei	BV
2016	Hopper Barge	Bremenports	DNV GL
2017	Cable layer	DEME Tideway	DNV GL
2017	Gas carrier	Evergas	BV
2017	Gas carrier	Evergas	BV
2017	Tug	Østensjø Rederi	

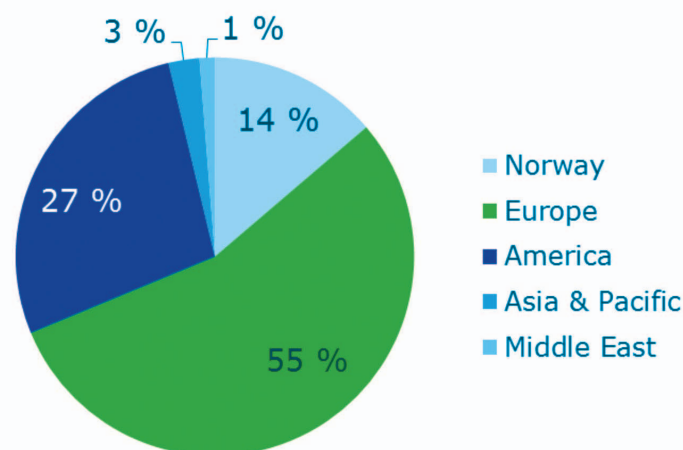
Year	Type of Vessel	Owner	Class
2017	Tug	Østensjø Rederi	
2017	Tug	Østensjø Rederi	
2017	RoPax	Rederi AB Gotland	DNV GL
2017	Car/passenger ferry	Caronte & Tourist	RINA
2017	Oil/chemical tanker	Groupe Desgagnés	BV
2017	Oil/chemical tanker	Groupe Desgagnés	BV
2017	Container ship	GNS Shipping	ABS
2017	Container ship	GNS Shipping	ABS
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
2018	Car/passenger ferry	CHFS	LR
2018	Car/passenger ferry	CHFS	LR
2018*	Ro-Ro	TOTE Shipholdings	ABS
2018	RoPax	Rederi AB Gotland	BV
2018	Container ship	Containerships	ABS
2018	Container ship	Containerships	ABS
2018	Heavy lift vessel	Heerema Offshore	LR
2018	Cruise ship	Carnival Corporation	RINA
2019	Cruise ship	Carnival Corporation	RINA
2020	Cruise ship	Carnival Corporation	RINA
2022	Cruise ship	Carnival Corporation	RINA

AREA OF OPERATION OF LNG FUELED SHIPS

**Global development
- ships in operation**



**Global development
- confirmed orderbook**



Updated 23 October 2015
Excluding LNG carriers and inland waterway vessels

WORLD SMALL SCALE LNG FLEET*

Name	CBM	Cargo Type	Built	Trading area	Trading in LNG?	Ship Owner / Operator
10 small carriers TBN?*	5000?	LNG	2015			Bimantara Group
Akebono Maru	3,556	LNG	2011	Japan	Yes	Chuo Kaiun
Aman Bintulu	18,928	LNG	1993	Malaysia - Japan	Yes	Perbadanan/NYK
Aman Hakata	18,800	LNG	1998	Malaysia - Japan	Yes	Perbadanan/NYK
Aman Sendai	18,928	LNG	1997	Malaysia - Japan	Yes	Perbadanan/NYK
Anthony Veder TBN	18,000	LNG	2017	Northwest Europe/Baltics	Yes	Anthony Veder
CME TBN	2,200	LNG	2016	US Coast	Yes	CME
CME TBN ?	2,200	LNG	2017	US Coast	Yes	CME
CME TBN ?	2,200	LNG	2017	US Coast	Yes	CME
CME TBN ?	2,200	LNG	2018	US Coast	Yes	CME
Coral Anthelia	6,500	LNG/Ethylene	2013			Anthony Veder
Coral Energy	15,600	LNG Ice Class 1A	2012	Northwest Europe/Baltics	Yes	Anthony Veder
Coral Methane	7,551	LNG/LPG/Ethylene	2009	Northwest Europe/Baltics	Yes, sometimes	Anthony Veder
Coralius	5,800	LNG Ice Class 1A	Feb 2017	Northwest Europe/Baltics	Yes, for Skangass	Anthony Veder
Dalian TBN	27,500	LNG	March 2015	China	Yes	Dalian Inteh Group
Evergas TBN	27,500	LNG/Ethylene	2016	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
Evergas TBN	27,500	LNG/Ethylene	2016	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
Evergas TBN	27,500	LNG/Ethylene	2016	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
Evergas TBN	27,500	LNG/Ethylene	2017	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
Evergas TBN	27,500	LNG/Ethylene	2017	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
Hai Yang Shi You 301	30,000	LNG	2015	China	Yes	CETS (CNOOC)
Jahre TBN**	6,200	LNG	2015?	Norway	Yes	Donsotank/Jahre Marine AS
JS Ineos Ingenuity	27,500	LNG/Ethylene	2015	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
JS Ineos Insight	27,500	LNG/Ethylene	2015	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
JS Ineos Intrepid	27,500	LNG/Ethylene	2015	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
JX Energy TBN	2,500	LNG	2013	Japan	Yes	JX Energy
Kakurei Maru	2,536	LNG	2008	Japan	Yes	Hogaki Zosen
Kakuyu Maru	2,500	LNG	2013	Japan	Yes	Tsurumi Sunmarine
Kayoh Maru	1,517	LNG	1988	Japan	Yes	Daiichi
LNG Barge TBN	3,000	LNG Barge	2015	US Coast	Yes	LNG America
LNG bunker barge 1?	2,250	LNG	2015	China	Yes	Anhui Huaqiang Natural Gas
LNG bunker barge 2?	2,250	LNG	2015	China	Yes	Anhui Huaqiang Natural Gas
LNG bunker barge 3?	2,250	LNG	2015	China	Yes	Anhui Huaqiang Natural Gas
LNG Inland bunker**	800	LNG	2015	Germany	Yes	Veka
LNG Prime	2,250	LNG Inland Barge	2016	Northwest Europe	Yes	Veka Deen LNG
LNG-Gorskaya TBN	7,300	LNG	2017	Russia	Yes	LNG-Gorskaya
LNG-Gorskaya TBN	7,300	LNG	2017	Russia	Yes	LNG-Gorskaya
LNG-Gorskaya TBN	7,300	LNG	2017	Russia	Yes	LNG-Gorskaya
LNG-Oil combi**	2,000	LNG	2014?	Germany	Yes	Veka
Navigator Aurora	35,000	Ethane/Ethylene	April 2016	Markus Hood - Stenungsund	Ethane, for Borealis	Navigator
Navigator Eclipse	35,000	Ethane/Ethylene	2017	US	Ethane	Navigator
Navigator Nova	35,000	Ethane/Ethylene	2017	US	Ethane	Navigator
Navigator Prominence	35,000	Ethane/Ethylene	2017	US	Ethane	Navigator
Norgas Bahrain Vision	12,000	LNG/LPG/Ethylene	2011	Worldwide	No	Norgas Carriers
Norgas Conception	10,000	LNG/LPG/Ethylene	2011	Worldwide	No	Norgas Carriers
Norgas Creation	10,000	LNG/LPG/Ethylene	2010	Worldwide	No	Norgas Carriers
Norgas Innovation	10,000	LNG/LPG/Ethylene	2010	Worldwide	No	Norgas Carriers
Norgas Invention	10,000	LNG/LPG/Ethylene	2011	Worldwide	No	Norgas Carriers
Norgas TBN**	17,000	LNG/LPG/Ethylene	2015	Worldwide		Norgas Carriers
Norgas TBN**	17,000	LNG/LPG/Ethylene	2015	Worldwide		Norgas Carriers
Norgas Unikum	12,000	LNG/LPG/Ethylene	2011	Worldwide	No	Norgas Carriers
North Pioneer	2,500	LNG	2005	Japan	Yes	Japan Liquid Gas
NYK Bunker barge TBN	5,100	LNG	2016	Northwest Europe	Yes	NYK
Ocean Yield TBN	36,000	Ethane/Ethylene	2016	US - Teeside	Ethane, for Sabic	Gaschem Services
Ocean Yield TBN	36,000	Ethane/Ethylene	2016	US - Teeside	Ethane, for Sabic	Gaschem Services
Ocean Yield TBN	36,000	Ethane/Ethylene	2016	US - Teeside	Ethane, for Sabic	Gaschem Services
PetroChina TBN	30,000	LNG	March 2015	China		PetroChina
Pioneer Knutsen	1,100	LNG	2003	Norway	Yes	Knutsen
Seagas	187	LNG Barge	1974	Sweden	Yes	AGA
Shell Bunker Barge TBN 1	6,500	LNG Barge	2016	Northwest Europe	Yes	Anthony Veder? / Shell?
Shell Bunker Barge TBN 2	6,500	LNG Barge	2016	Northwest Europe	Yes	Anthony Veder? / Shell?
Shell Bunker Barge TBN 3	6,500	LNG Barge	2016	Northwest Europe	Yes	Anthony Veder? / Shell?
Shell Bunker Barge TBN 4	3,000	LNG Barge	2016	Northwest Europe	Yes	Anthony Veder? / Shell?
Shinju Maru No.1	2,540	LNG	2003	Japan	Yes	Shinwa
Shinju Maru No.2	2,540	LNG	2008	Japan	Yes	Shinwa
Short Sea LNG Tanker **	4,000	LNG	2014?	Germany	Yes	Veka
Sun Arrows	19,531	LNG	2007	Malaysia - Russia - Japan	Yes	Mitsui
Surya Aki	19,475	LNG	1996	Indonesia - Japan	Yes	MCGC
Surya Satsuma	23,096	LNG	2000	Indonesia - Japan	Yes	MCGC
TBN	14,000	LNG	Aug 2015	China	Yes	Zhejiang Huaxiang
TBN 1	27,500	LNG	2015	China?		Danyang?
TBN 2	27,500	LNG	2015	China?		Danyang?
TBN 3	27,500	LNG	2015	China?		Danyang?
Yuan He 1	30,000	LNG	2015	China	Yes	CSR

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 ships are still at construction/planning stage

** = project shelved ?=Data to be verified Data last updated = November 6, 2015