

LNG Fuelling

AN LNG JOURNAL PUBLICATION

12 January 2017

Japan plans ship-to-ship LNG bunkering for 2020

The Japanese government has set a date of 2020 to launch ship-to-ship LNG bunkering as part of a three phase plan to strengthen LNG fuelling infrastructure in the country.

The aims are outlined in a new feasibility study published by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) which uses the Port of Yokohama on the Tokyo Bay as a model case for LNG bunkering activities.

The MLIT strategy outlines a first phase of activity focused on optimizing truck-to-ship bunkering that will commence in 2017 followed by second phase in 2020 which will introduce of ship-to-ship bunkering. A final phase to strengthen ship-to-ship bunkering infrastructure will commence once "demand reaches a certain scale".

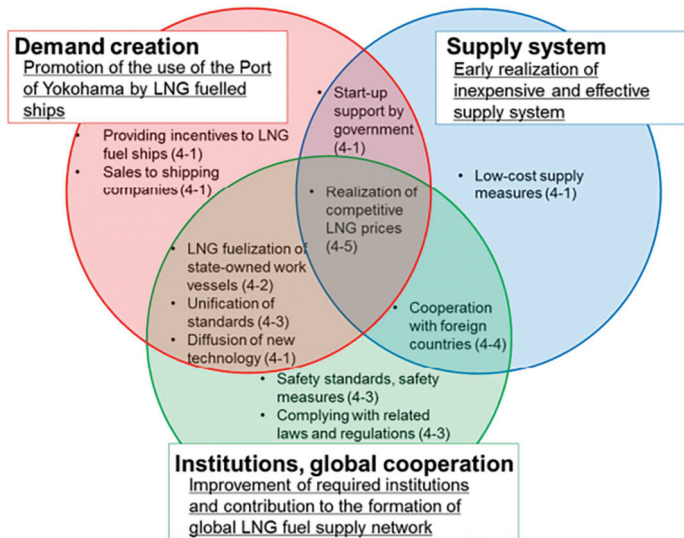
"[For the Sodegaura terminal] the limit value of supply will be about 300 thousand to 400 thousand tons per year due to the limitation of the mooring capacity of the LNG terminal," the report's authors note.

The MLIT expects to use existing facilities at the Sodegaura terminal in Tokyo Bay to supply LNG to bunkering ships in the first instance but should demand breach this limit value the report's author suggests that there will be a strong business case for at least two LNG bunker-supply vessels operating from Yokohama's Negishi LNG terminal.

Earlier this month, two Japanese power providers received the country's first shipment of LNG from the continental U.S.. The LNG tanker *Oak Spirit* delivered 70,000 tons of LNG to Joetsu LNG terminal.

Yokohama considering support measures

As a result of the study Yokohama Port and Harbor Bureau is consid-



Measures towards the realization of LNG bunkering hub development

ering several measures to promote port calls by LNG fuelled ships. These include establishment of an incentive system or subsidy system partnerships with shipping companies, support for dissemination of LNG ship and bunkering technology and further exploration of safety aspects.

The report notes that a "a European LNG-bunkering company" in partnership with NYK Line is scheduled to launch the country's first dedicated LNG bunker-supply vessel with 5,000 cubic metre capacity.

"I hope that the reinforcement of the competitiveness of our ports will contribute to the growth of the Japanese economy and a new LNG fuel supply market will be developed through the rapid development of LNG bunkering hub," Masamichi Morooka, chairman of the Steering committee for LNG bunkering at the port of Yokohama, said.

The steering committee respon-

sible for the report included input from industrial partners Tokyo Gas, Nippon Yusen Kabushiki Kaisha (NYK LINE), Yokohama Kawasaki International Port, Yokohama City Office and the Japanese Coast Guard.

MLIT highlights Singapore for greater cooperation

Alongside investment from the Japanese government into bunker infrastructure the report also calls for greater collaboration at the international level to ensure standards and progress technology development.

"It is necessary to form a network among LNG bunkering bases in multiple countries in order to further promote LNG fuelled ships... Especially, strengthening the cooperation with Singapore, which is the world's largest bunkering country, will lead to the development of a new LNG bunkering market," the report's authors note.

FUELLING NEWS AGENDA

BUNKER OPERATIONS

Skargas bunkers
Tallink Megastar

2

STANDARDS



ABS issues LNG bunker guidelines

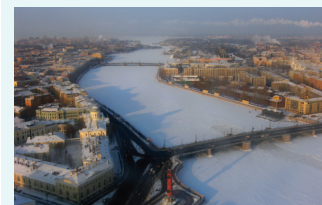
3

REGULATION

New initiative for port of Duisburg

5

SUPPLY DEALS



LNG Gorskaya signs Marine Façade bunkering deal

6

LNG ORDERBOOK

LNG-fuelled ship fleet

8

LNG-fuelled confirmed newbuilds

10

LNG small scale fleet

11

Skangas bunkers Tallink Megastar

Norwegian terminal operator Skangas has completed the first bunkering operations for the LNG-fuelled fast ferry M/S *Megastar* at its newly opened Skangas Pori LNG terminal in Finland.

"We're happy that *Megastar* is now ready for operation and we're able to supply her with LNG, a fuel that has excellent environmental properties as its sulphur dioxide, particulate, nitrogen oxide and carbon dioxide emissions are very low," Tommy Mattila, sales and marketing director at Skangas, said.

LNG tanks hold 600 m³

The vessel features two stainless steel LNG tanks, located below deck three, each of which have a total volume of 600 cubic metres. Following the successful bunkering operation, the vessel will complete its maiden voyage from Tallinn to Helsinki in late January.

"Using LNG as a fuel is an efficient way of reducing the environmental impacts of shipping. Hull form design and modelling helped minimize hull resistance - and

therefore also minimize energy consumption during operation," Kari Toivonen, project manager at Meyer Turku, said.

Meyer Turku is a subsidiary of German marine engineering group Meyer Werft

Vessel design meets ECA standards

The *Megastar* is the first of a series of new fast ferries designed and built by Finnish shipbuilder Meyer Turku Shipyard. The vessel will operate on LNG fuel and is now compliant with the European Union's revised emission regulations that cover Emission Control Areas (ECAs) such as the Baltic Sea.

"Thanks to LNG, the engine exhaust gases contain hardly any nitrogen oxides, which are particularly harmful as regards issues such as the eutrophication of the Baltic Sea. We want to offer



The *Megastar* was bunkered at Skangas Pori LNG terminal

the shipping industry reliable, safe and efficient LNG bunkering," Mattila added.

The *Megastar* measures a total 212 meters in length and has space for 2,800 passengers. Construction commenced in summer 2015 and took approximately a year to complete with the first launch in July 2016.

"It has been great to partici-

pate in the construction of the new-generation LNG-powered Tallink *Megastar*. *Megastar* is yet another proof of Meyer Turku being a global forerunner in the construction of LNG-powered ships."

The vessel will operate a daily shuttle service between the Finnish capital Helsinki and the Estonian capital of Tallinn at a service speed of 27 knots. ■

Gazpromneft completes Arkhangelsk LNG bunkering

LNG specialist Gazpromneft Marine Bunker has delivered the first LNG fuel for bunkering operations at the port of Arkhangelsk as part of its agreement with port operator FSUE Rosmorport.

The delivery the first of a regular LNG supply deal between the two firms that will see about 15 thousand tons of LNG delivered over the next three years.

A total of 2,600 tonnes of LNG fuel was delivered by icebreaker to the remote port on the Northern Dvina River. The LNG bunker



Gazpromneft Marine Bunker delivered first LNG fuel at Arkhangelsk

station is 50 kilometres from the Dvina Bay on the White Sea.

LNG delivered by Northern Sea Route

The fuelling operation marked one of the first major LNG bunker deliveries transported via the Northern Sea Route. This route runs along the Russian Arctic coast and until recent years has been largely impassable for most of the year due to thick sea ice but is increasingly accessible as temperatures in the Arctic rise.

"Efficient service and uninterrupted supply of marine fuels is one of the basic conditions for the development of the Northern Sea

Route," Andrei Vasilyev, director general of Gazpromneft Marine Bunker, said.

The vessel, *Kapitan Dranitsin*, accompanied transport vessels carrying materials for the construction of onshore facilities for the world's first floating nuclear power plant in the nearby town of Pevek.

Gazprom expands LNG investments

Gazpromneft Marine Bunker is a subsidiary of Russian oil and gas firm Gazprom and focuses on operation and supply of the firm's LNG assets and networks.

Last month Gazprom and Russian oil producer Rosneft signed a

memorandum of understanding with the National Iranian Oil Company (NIOC) conduct studies into the possible development of energy resources in Iran. These are reported to include two oil fields and joint LNG projects.

Gazprom is also in discussion with Japanese engineering firms Mitsui and Mitsubishi on the implementation of a Baltic LNG project in Russia's Leningrad region.

"We have expanded the geography of our cooperation in the sphere of the liquefied natural gas. We are discussing the possibility of cooperation in construction of the Baltic LNG plant," Alexey Miller, Gazprom chairman, said. ■

LNG Fuelling

1st Floor, 30 Warner Street
London EC1R 5EX,
United Kingdom
www.lngjournal.com
Tel: +44 (0)20 7017 3404

Publisher
Stuart Fryer

Editor

Malcolm Ramsay
+44 (0)20 7017 3413
malcolm@lngjournal.com

Ad sales enquiries

Narges Jodeyri
+44 (0)207 017 3406
narges@lngjournal.com

Subscriptions

Elena Fuentes
Tel: +44 (0) 20 7253 2700
elena@lngjournal.com
Subscription included with LNG Journal

Production

Vivian Chee
Tel: +44 (0) 20 8995 5540
chee@btconnect.com

No part of this publication may be reproduced or stored in any form by any mechanical, electronic, photocopying, recording or any other means without the prior written consent of the publisher. Whilst the information and articles in LNG Shipping News are published in good faith and every effort is made to check accuracy, readers should verify facts and statements direct with official sources before acting on them as the publisher can accept no responsibility in this respect. Any opinions expressed in this publication should not be construed as those of the publisher."

ABS issues LNG bunker guidelines

Standards agency American Bureau of Shipping (ABS) has published new guidelines for LNG bunkering which outline requirements for the “design, construction, and survey” of LNG-fuelled carriers and barges.

The guidelines are designed to support further growth and development of LNG-fuelled vessels for short sea and international trade as well as providing a framework for the development of new bunkering infrastructure.

“It is recognized that more dedicated LNG infrastructure needs to be developed; particularly small scale LNG storage and distribution centers together with dedicated LNG bunkering vessels enabling ship-to-ship LNG transfer,” a spokesperson for ABS said.

Guidelines to support LNG infrastructure growth

Application of the guidelines is a requirement for those operators seeking accreditation to ABS LNG Bunkering notation and although the rules are otherwise optional the agency expects the guide will act as a first phase for the wider introduction of new infrastructure.

“It is envisaged that greater LNG transfer rates than those typically used for refuelling the current gas-fuelled ship fleet will be required and this will necessitate the deployment of new and additional bunkering equipment and operational practices,” the



ABS guidelines are in effect from Jan 2017

report's author state.

Safety to drive vessel design

The new guidelines are in effect from the start of 2017 and also cover a range of safety considerations for bunkering stations including lifting and hose handling equipment, control, monitoring and Emergency Shutdown (ESD) systems as well as emergency release systems.

“Ship designers, shipyards, ship owners/operators and other interested stakeholders are encouraged to determine the full applicable requirements and obtain the necessary approvals as early as possible in any LNG bunkering new construction or conversion project,” a spokesperson for ABS said.

Guidelines informed by Project Forward alliance

Through its work as a classification society ABS has been a strong proponent of LNG fuelling and one of the founding members of the Project Forward consortium, which aims to develop the first commercial LNG-fuelled dry bulk carrier vessels.

The consortium brings together some of the world's leading LNG specialists and input from partner organisations has helped inform the new guidelines.

The consortium includes Greek bulk carrier Arista Shipping, ship designer Deltamarin, engine manufacturer Wärtsilä, LNG membrane containment firm GTT and energy company Shell. ■

NEWS NUDGE

Vard to build LNG ferries for Torgshatten Nord

Marine engineering company Vard has been commissioned to build two LNG-fuelled RoPax vessels for Norwegian ferry operator Torgshatten Nord.

The contracts are valued at NOK 600 million and specify delivery of two Multi Maritime MM 125FD vessel. Each ferry will measure 130 meters in length with a beam of 20.7 meters, and will have a speed of approximately 18 knots.

“I would like to welcome Torgshatten Nord as a new client to VARD, and we look forward to working together with their team on this exciting project, combining LNG propulsion and battery systems. VARD has long experience in building LNG powered and dual fuel vessels,” Roy Reite CEO of Vard, said.

The ferries will operate in the Halhjem-Sandvikvåg crossing under a five-year contract with the Norwegian government.

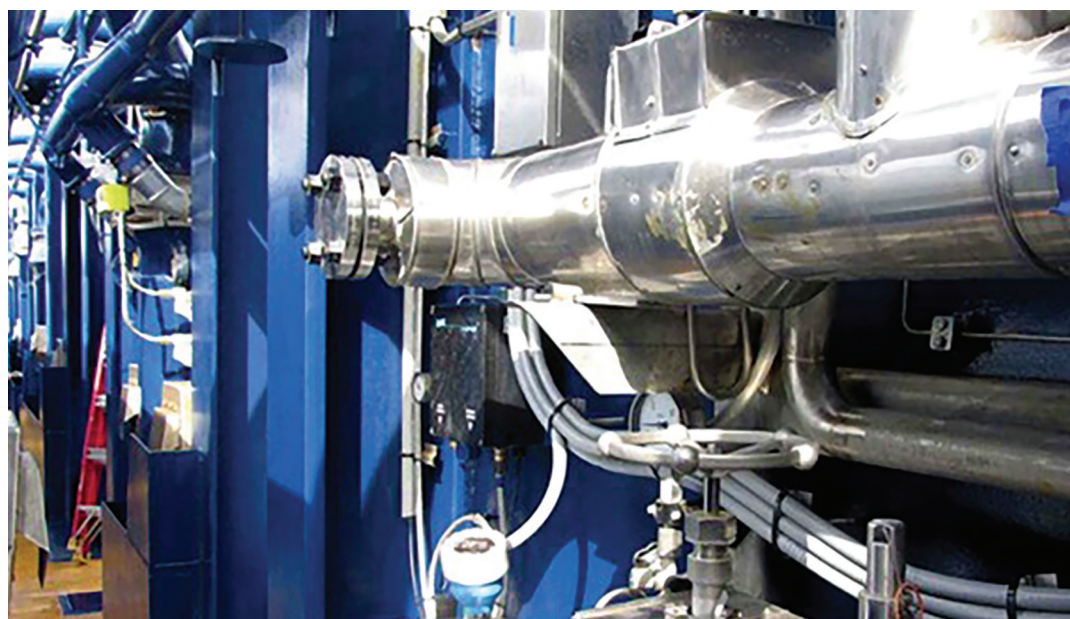
Delivery of the ferries is scheduled from Vard Brevik in Norway in 3Q 2018 and 4Q 2018 respectively

Danish bunker firm NORbunker launches

New bunker trading company NORbunker A/S has launched in Denmark, offering fuel trading and some broking services.

The firm is headquartered in Aalborg in the Jutland region of Denmark and will be headed by founder Jesper Riis Christiansen.

Christiansen brings previous experience trading at Nordic bunker firms Monjasa, Malik Supply and Nordic Marine Oil.



The ABS LNG bunker guidelines aim to improve safety

FOAMGLAS®

Pittsburgh Corning

FOAMGLAS® INSULATION
Trusted by contractors and
engineers worldwide
for over 75 years.

**FOAMGLAS®
INSULATION**

**FOR LNG,
ENGINEERED TO LAST.**

Contact us to learn more
www.foamglas.com
1-724-327-6100 | 800-545-5001

PITTSBURGH CORNING SERVICES:

- Education & Training
- Energy & Thermal Imaging Surveys
- Insulation Thickness Calculations
- Insulation Guide Specifications
- Jobsite & Start-up Support
- Special Testing Services

RWE, Duisport to develop LNG fuelling infrastructure

European energy trading house RWE Supply & Trading is to partner with authorities at the German port of Duisburg to implement a joint project focused on developing LNG fuelling infrastructure at the port.

The partners aim to investigate sustainable logistics for the “provision, storage, distribution and utilisation” of LNG at the port and to develop new LNG fuelling bunker station.

“We are happy to be working with Duisport on this innovative project. The port of Duisburg provides excellent possibilities for the use of LNG. As the biggest inland port in the world it has a perfect connection to all traffic channels,” Andree Stracke, member of

the Executive Board of RWE Supply & Trading said.

Preliminary work has already commenced with the partners having selected a site for the bunker station and completed studies into the potential impact of LNG as a replacement for existing diesel fuels.

Phase 1 to invest €500 million

The first phase of development is expected to require investment in

the region of €500 million and will involve installation of a mobile fuel pump at the port. This mobile solution will be used to supply LNG to the port’s fleet of reach stacker and terminal towing vehicles. LNG fuel will also be supplied to trucks operated by local logistics companies.

“With their long track record in LNG sourcing as well as building, operation and maintenance of gas supply assets, RWE is the ideal partner for this project. This project is another step forward in our endeavour to permanently optimise the port of Duisburg,” Erich Staake, CEO of Duisport, said.

RWE backs Rhein-Ruhr LNG growth

RWE will work with the port’s transport division to convert existing vehicles to operate on LNG and conduct thorough testing in

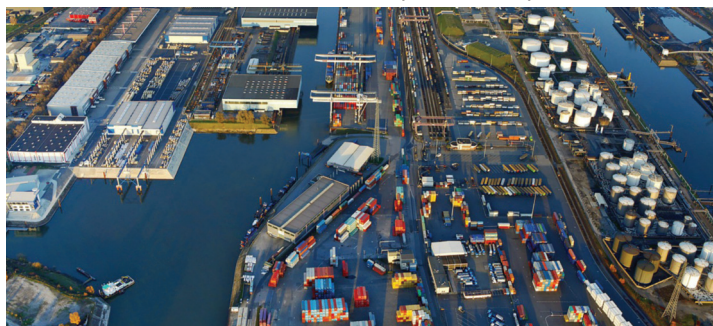
daily operations.

RWE Supply & Trading is a subsidiary of German electric utility RWE and is responsible for the group’s economic optimisation of power generation as well as all LNG-related activities.

The group operates Europe’s largest energy trading floor in Essen and sees a strong opportunity for LNG fuelling growth in the west German region.

“Not only vessels, trains, port vehicles and lorries, but also the Rhein-Ruhr region’s industries and dense population offer excellent opportunities including a large potential consumer base,” a spokesperson for RWE said.

The port of Duisburg is a tri-modal logistics hub and the largest inland hub in Europe. It covers 1,400 hectares and handles over 129 million tonnes of cargo per year.



Duisport logistics hub

Singapore’s MPA grants 51 bunker licenses

Singapore’s port authority has issued bunker survey licences for 51 companies to operate in the Port of Singapore.

The Maritime and Port Authority of Singapore (MPA) awarded the licenses to firms providing a full range of inspection and survey services as it seeks to ensure LNG bunkering on the island is conducted to the highest international standards.

“This new licensing scheme for bunker surveying companies complements the existing schemes of requiring bunker surveyors to be licenced and requiring bunker survey companies to be accredited to ISO 17020,” Darajit Daud, Senior Manager, SGS Testing & Control Services Singapore, said.

Survey skills to drive industry benefits

The licences are expected to support further growth of LNG bunker infrastructure on the island and will be valid from 1 January 2017

to 31 December 2017.

“In the long term, we expect that both the bunker and shipping community will benefit from this. We believe that together, these schemes will enhance industry confidence in the many bunker surveying companies in Singapore and further help protect the interest of the relevant bunker players in this multi-billion dollar business,” Daud said.

Licensing to ensure shipping confidence

The MPA has invested heavily in LNG bunkering infrastructure as part of a government strategy to establish Singapore as both a leading supply hub for LNG fuel and a centre of excellence for LNG bunkering technology.

“We are confident that the licensing of bunker surveying com-



The port of Singapore

panies will reassure buyers and sellers that Singapore’s bunkering industry is well-served by trained and certified professionals - this initiative, together with the mandatory implementation of mass flow meters (MFMs), demonstrate MPA’s commitments towards promoting Singapore as a premium bunkering hub,” S K Lim, chairman of Singapore’s SSA Services Committee, said.

Last year, the MPA extended its existing Maritime Singapore Green Initiative (MSGI) - through its Green Ship Programme (GSP) and

Green Port Programme (GPP) - helping to create financial benefits for ship owners using LNG and to drive uptake of the fuel for shipping.

“MPA will ensure that the MSGI remains relevant and supports the move towards a more Sustainable Singapore and global maritime community. The extension of the MSGI Programme is a strong demonstration of our commitment towards an environmentally friendly and sustainable global hub port,” Andrew Tan, CEO of MPA, said.

LNG Gorskaya signs Marine Façade bunkering deal

Fuelling specialist and developer LNG Gorskaya has signed an agreement to develop LNG bunkering infrastructure for cruise ships and ferries at Russia's new Marine Façade passenger port in St. Petersburg.

The deal will see LNG Gorskaya deliver the first LNG fuel to the site from 1 January 2018 from a non-self-propelled barge.

"The delivery of LNG to consumers will be carried out by bunkering vessels with LNG stored on-deck in tank containers. LNG Gorskaya plans to enter the production facility into operation in December 2017 and at the same time to start selling LNG," a spokesperson for the firm said.

The project will produce an estimated 1.26 million tons of LNG per year, based on supply of 1.968 billion cubic metres of natural gas. Fuel will be delivered to vessels docked at the new Marine Fascade site.

Once complete the port will cover 476 hectares of reclaimed alluvial territory on Vasilevsky Island in the mouth of the Neva River.

Three phase development

The proposed LNG Gorskaya plant will consist of three processing capacity lines, each of which will have capacity of 656 million cubic metres.

A first phase of development will see one processing line launched at the end of 2017. This will be followed by a second and third phase which are expected to be ready by the end of 2019 and 2021 respectively.

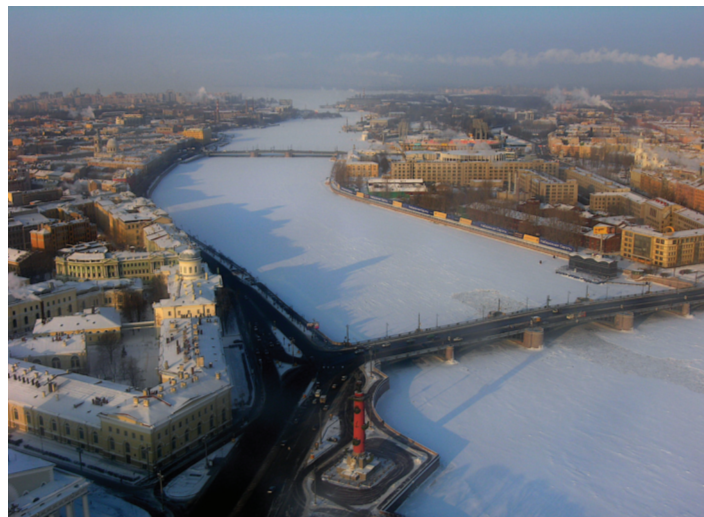
"During the first phase of the project, three bunkering vessels - each with a storage capacity of 7,000 cubic metres - are to be built. Vessels anchored in the Gulf of Finland are to be refuelled via the ship-to-ship bunkering method," a company spokesperson explained.

Alongside the introduction of new bunkering vessels, the first phase will include construction of a pier, loading rack and gas pipeline as well as ancillary ground infrastructure at the port.

St. Petersburg to connect with Baltic network

The Marine Façade agreement follows plans previously announced by LNG Gorskaya to build bunker stations at the port of Mõntu, in western Estonia and at Lübeck in Germany.

The Russian firm has signed



Vasilevsky Island

an agreement of intent with port authorities in Mõntu to create a floating LNG storage unit with capacity up to 5,000 cubic metres and in Lübeck for a bunker station with 2,200 tonne capacity. The Lübeck site is currently scheduled to be complete by September 1, 2017.

The firm expects both projects to be predominantly financed by LNG Gorskaya with some external funds potentially provided by EU-sponsored programme such as the

Connecting Europe Facility (CEF) for Transport initiative.

"Bunkering vessels sourcing product from the LNG centres in Montu and Lubeck would be capable of supplying ships at ports not only in Estonia and Germany, but also in Sweden and Latvia," the company states.



Vessels docking at the new Marine Façade port will refuel with LNG

NEWS NUDGE

GTT announces first order for Mark V technology

French LNG specialist GTT is to provide its Mark V technology for a new LNG carrier ordered by European ship-owner Gaslog.

"This first order of Mark V shows our ability to meet market requirements. Gaslog's choice of our new membrane containment system highlights the confidence of our partners in our innovations," Philippe Berterotière, Chairman and CEO of GTT, said.

The vessel will be built in Goeje Island at Samsung Heavy Industries shipyard. Delivery is scheduled in 2019.

Chart Brazed Aluminum Heat Exchangers



First to Produce LNG On-board a Floating Facility

Custom designed, highly efficient, compact heat exchangers with superior heat transfer performance and operational flexibility. Providing substantially lower weight, scalability, modular construction and proven performance, Chart Brazed Aluminum Heat Exchangers are uniquely suited to the rigors of floating vessels, where space is at a premium and reliability is paramount.

www.chart-ec.com



Innovation. Experience. Performance.®

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

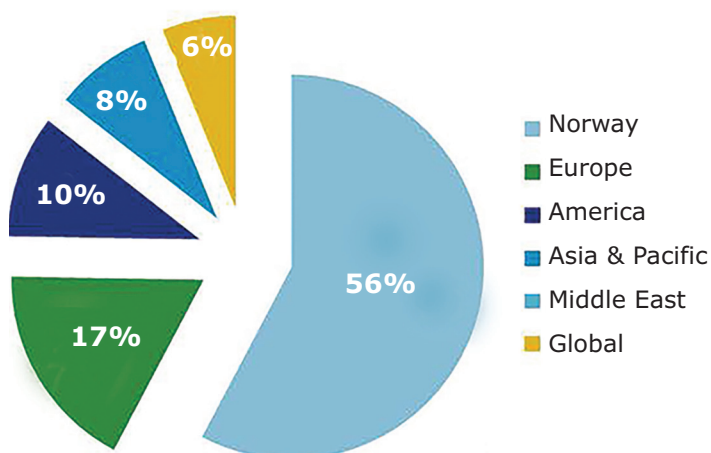
Data last updated: 9 December 2016

* = conversion projects

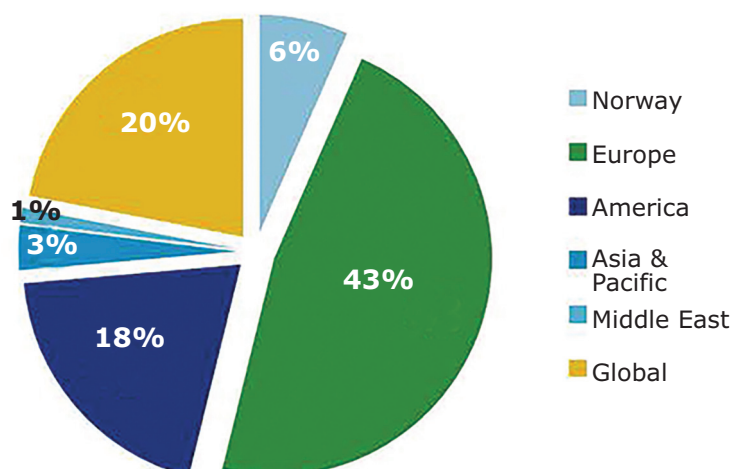
Year	Type of Vessel	Owner	Class
2015	Gas carrier	Evergas	BV
2015	Gas carrier	Evergas	BV
2015	Tug	CNOOC	CCS
2015*	Car/passenger ferry	AG Ems	DNV GL
2015	Tug	NYK	NK
2015	Gas carrier	Chemgas Shipping	BV
2015	Gas carrier	Evergas	BV
2015	PSV	Harvey Gulf Int.	ABS
2015	Container ship	TOTE Shipholdings	ABS
2015	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

AREA OF OPERATION OF LNG-FUELLED SHIPS

Operating area
ships in operation



Operating area
confirmed orderbook



Updated 19 December 2016
Excluding LNG carriers and inland waterway vessels

WORLD LNG-FUELLED CONFIRMED NEWBUILDS

Year	Type of Vessel	Owner	Class
2016	Car/passenger ferry	Society of Quebec ferries	LR
2016	Car/passenger ferry	Society of Quebec ferries	LR
2016	Tug	Drydocks World	
2016	PSV	Harvey Gulf Int.	ABS
2016	PSV	Harvey Gulf Int.	ABS
2016	PSV	Siem Offshore	DNV GL
2016	Gas carrier	Evergas	BV
2016	PSV	Harvey Gulf Int.	ABS
2016	PSV	Siem Offshore	DNV GL
2016*	Ro-Ro	TOTE Shipholdings	ABS
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	Gas carrier	Navigator Gas	ABS
2016	Gas carrier	Navigator Gas	ABS
2016*	RoPax	Baleària	BV
2016	Dredger	DEME	BV
2016	Dredger	DEME	BV
2016*	Container ship	Wessels Reederei	BV
2016	Hopper Barge	Bremenports	DNV GL
2016	HSLC	Fred. Olsen	DNV GL
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
2017	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	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
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	Dredger	DEME	BV
2018	Bulk ship	POSCO	KR
2018	Dredger	van der Kamp	DNV GL
2019	Cruise ship	Carnival Corporation	RINA
2019	Cruise ship	Carnival Corporation	RINA
2019	Oil/chemical tanker	Ålvtank	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	Oil/chemical tanker	Rosneft	
2020	Oil/chemical tanker	Rosneft	
2020	Oil/chemical tanker	Rosneft	
2020	Oil/chemical tanker	Rosneft	
2020	Oil/chemical tanker	Rosneft	
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 : 9 December 2016

* = conversion projects

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	Aman Hakata	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	Tripura (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 Bahrain Vision	12,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
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	Norgas Unikum	12,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2012	Coral Energy	15,600	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2013	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2014	LNG-Oil combi**	2,000	LNG	Germany	Yes	Veka
2014	Short Sea LNG Tanker **	4,000	LNG	Germany	Yes	Veka
2015	10 small carriers TBN**	5,000	LNG			Bimantara Group
2015	Jahre TBN**	6,200	LNG	Norway	Yes	Donsotank/Jahre Marine
2015	JS Ineos Ingenuity	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Insight	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Intrepid	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	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 Inland bunker**	800	LNG	Germany	Yes	Veka
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	PetroChina TBN	30,000	LNG	China		PetroChina
2015	TBN	14,000	LNG	China	Yes	Zhejiang Huaxiang
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	Yuan He 1	30,000	LNG	China	Yes	CSR
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	Dalian TBN	28,000	LNG	China	Yes	Dalian Inteh Group
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Innovation	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Inspiration	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	LNG Prime	2,250	LNG	Northwest Europe	Yes	Veka Deen LNG
2016	Navigator Aurora	35,000	Ethane/Ethylene	Markus Hood - Stenungsund	Ethane, for Borealis	Navigator
2016	NYK Bunker barge TBN	5,100	LNG	Northwest Europe	Yes	NYK
2016	Ocean Yield TBN	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
2016	Ocean Yield TBN	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Shell Bunker Barge TBN 1	6,500	LNG	Northwest Europe	Yes	Shell
2016	Shell Bunker Barge TBN 2	6,500	LNG	Northwest Europe	Yes	Shell
2016	Shell Bunker Barge TBN 3	6,500	LNG	Northwest Europe	Yes	Shell
2016	Shell Bunker Barge TBN 4	3,000	LNG	Northwest Europe	Yes	Shell
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	Coral EnergICE	18,000	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2017	Coralius	5,800	LNG	Northwest Europe/Baltics	Yes, for Skangas	Anthony Veder
2017	Evergas TBN	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	Evergas TBN	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
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	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	Bernhard Schulte TBN	7,500	LNG	Baltic	Yes	Bernhard Schulte
2018	CME TBN†	2,200	LNG	US Coast	Yes	CME
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

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 = 11 January 2017