LNG Fuelling

AN LNG JOURNAL PUBLICATION 20 April 2017

Singapore launches LNG truck loading facility

Authorities in Singapore have launched the nation's first LNG truck bunkering facility at a terminal on Jurong Island.

The single-bay facility was jointly launched by the Singapore LNG Corporation (SLNG) and Maritime and Port Authority of Singapore (MPA) and was hailed as an "important first step" towards developing the LNG trucking business in Singapore.

Aerial view of Singapore's first LNG truck loading facility

Scope for further four bays

"As the demand grows and there is a viable business case, the SLNG Terminal's design masterplan provides for at least another four truck loading bays to be built… SLNG is proud to have been able to develop this facility with the support of the MPA and in doing so, help to concurrently kick-start the development of LNG trucking and LNG bunkering in Singapore," John Ng, CEO of SLNG, said.

The Singapore government has long stated an ambition to develop the island-state into a regional LNG fuelling hub and in January this year, appointed two LNG bunker supplier licenses.

"As the leading bunkering hub in the world, we need to ensure that we cater to the future energy needs of the global shipping industry by providing cleaner, alternative sources of fuel. While it may take time for LNG to take off as a marine fuel globally, we have taken steps to kick-start LNG bunkering in Singapore through our LNG Bunkering Pilot Programme," Andrew Tan, CEO of the MPA, said.

Prospects for LNG bunkering 'look good'

The new facility will allow operators across Singapore to access small-scale LNG supplies as the fuel can now be transported overland to "just about any location" where it may be needed.

"While it is still too early to tell how fast or how far these businesses will grow, the prospects look good, particularly for LNG bunkering. SLNG will remain committed to do its part, within its capabilities, to nurture the growth of these trades," Ng added.

The MPA and SLNG expect that trucks filled with LNG from the facility will now be employed for a wide variety of industrial purposes ranging from truck-to-ship LNG bunkering to refuelling furnaces and burners at remote plants.

"The completion of the truck loading facility marks another important milestone as it will enable truck-to-ship LNG bunkering in Singapore. MPA will continue to work with our stakeholders to put in place a framework to provide safe, efficient and reliable LNG bunkering in the Port of Singapore," Tan commented. ■

SLNG and MPA staff celebrating the Launch of Singapore's first LNG truck loading facility

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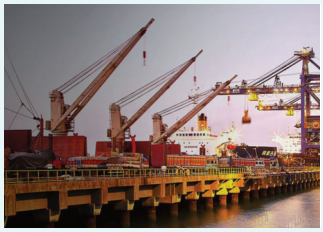

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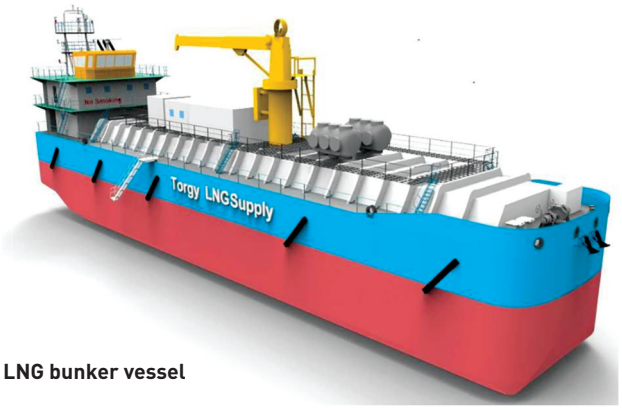
LNG Supply, Torgy LNG sign MoU for two bunker vessels

LNG fuelling specialists Torgy LNG and LNG Supply BV have signed a memorandum of understanding to develop two small self-propelled LNG Bunker vessels.

The proposed vessels will feature Torgy A-type tanks and will be capable of refueling Baltic traders, cruise vessels and inland terminals. Both barges will be operated by LNG Supply's parent company Grona Shipping.

"The barges will be of Torgy design utilizing the Torgy A-tank design. These tanks follow the ship hull and offer the most efficient solution leading to very economical operations. The barges will be seagoing, with low draft to be able to do bunkering operations in the Inland waterways system in this area," a spokesperson for Torgy said.

The designs for the barges were developed in close cooperation with several potential customers and include specific Lanai-deck provisions and Ship-to-Ship and Ship-to-Shore bunkering possibilities. The MoU partners will provide development and procurement services for the two 635-tonne payload bunker barges.



Torgy LNG bunker vessel

Barges to supply ARA region and Lower Baltics

The barges will operate throughout the greater ARA region of the North Sea, ranging from Cherbourg to Cuxhaven and inland to Duisburg. The second barge will extend operations in the Lower Baltics and will be 1A ice class with an option to supply at various UK-ports is an option.

"LNG Supply is convinced that the LNG market will be a high volume, low margin environment and that LNG storage should be limited as much as possible. The Torgy type A-tank support this opinion. Some of the large capacity holders have expressed their support for this initiative," a spokesperson for LNG Supply said.

Dutch joint stock company LNG Supply is a wholly-owned subsidiary of Grona Shipping and Holland Ship Thruster. Grona provides seaborne transport solutions and Holland Ship Thruster was one of the founders of LNGEurope and initiated the first LNG truck refueling sites in Northern Europe and the first LNG bunkering in Zeebrugge. It expects the new barges will also help promote the use of Liquefied bio Gar (LBG).

The ARA barge is well suited to facilitate the physical supply of LBG and to promote a credible development of a bio-LNG/LBG market. Currently LNG Supply bv is discussing with relevant parties the distribution of LBG.

Headquartered in Tønsberg, Norway, Torgy delivers turnkey engineering, project consultancy and installation of LNG storage and fuel systems for shipping as well as land-based industries. ■

Fluxys completes *Engie Zeebrugge* LNG bunkering first

Belgian gas transmission system operator Fluxys has announced the completion of the first LNG bunkering operations with its new bunker vessel *Engie Zeebrugge*.

The ship completed loading operations at the Zeebrugge LNG Terminal following delivery from Hanjin's Yeongdo shipyard in Busan, Korea at the start of April.

Dual fuel design

"First loading operation of LNG bunkering vessel *Engie Zeebrugge* was completed successfully at second jetty Zeebrugge LNG Terminal," a spokesperson for Fluxys Belgium said.

The *Engie Zeebrugge* has capacity for 5,000 cubic metres of LNG and measures 108 metres in length and 18 metres in breadth. The ship is powered by dual-fuel engines that can run on either LNG, marine gas oil or marine diesel oil.

Bunker capacity to support Gas4Sea

The vessel is jointly owned by Fluxys, French energy company Engie, engineering firm Mitsubishi, and shipping line NYK. The bunker ship will support the Gas4Sea joint venture run by Engie, Mitsubishi, and NYK and is intended to promote the development of LNG as a marine fuel.

In the near term the bunker vessel will operate from Fluxys' LNG terminal in Zeebrugge, where small carriers with capacities from 2,000 cubic metres upwards can dock at the recently commissioned second jetty.

The *Engie Zeebrugge* during loading operations

"The challenge in making LNG grow in the bunker market is to develop sufficient supply infrastructure to support the increasing number of LNG-fueled ships that are expected to come into operation. *Engie Zeebrugge*, in this respect, marks a milestone in the development of the European LNG bunkering chain," a spokesperson for Engie said.

Ship management services for the *Engie Zeebrugge* will be provided by NYK. ■

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Port of Koper examines LNG fuelling capabilities

Authorities in Slovenia are examining plans to develop LNG bunkering capabilities at the Port of Koper.

The port is located on the northern part of the Adriatic Sea and although the port operator Luka Koper does not foresee the existence of fixed infrastructure for LNG it expects to create support systems to bunker LNG powered vessels.

Luka Koper favours mobile solutions

"Considering space limitation of the Port of Koper and safety issues, the refuel would be possible only with mobile solutions - for example through specialized feeder vessels. For now it seems that refuelling could be done only at anchorage and not at berth," a spokesperson for Luka Koper said.

Andrej Stušek, director of Slovenian fuel specialist ENOS LNG presented several outcomes from existing studies into the use of LNG as fuel for port handling equipment, in particular for yard tractors and reach stackers. Štušek discouraged any retrofitting activity, since reliability and safety are of core importance for port operations.

"Economic calculations depend greatly on the price of LNG versus the price of diesel, it is true however that in case of LNG driven equipment emissions in the environment are lower in comparison to conventional equipment," Stušek said.

Luka Koper joins GAINN4MOS

To fully study the potential for mobile LNG fuelling infrastructure at the port, Luka Koper has joined the Action GAINN4 MOS program, which is co-financed by the European Union through the Connecting Europe Facility.

The port favours LNG as fuel for port handling equipment

The port has previously been awarded €300,000 under the initiative which is managed by Fundacion Valenciaport and is focused on the implementation of the EU Directive on the establishment of the infrastructure for the supply of LNG and alternative energy products.

The Port of Koper mainly connects markets of Central and Southeast Europe with the Mediterranean Sea and Far East. Luka Koper controls the management of the free zone area, the management of the port area and terminal operations.

The Port of Koper has 12 specialized terminals including container and ro-ro terminals, a general cargo terminal, european energy terminal and passenger terminal. ■

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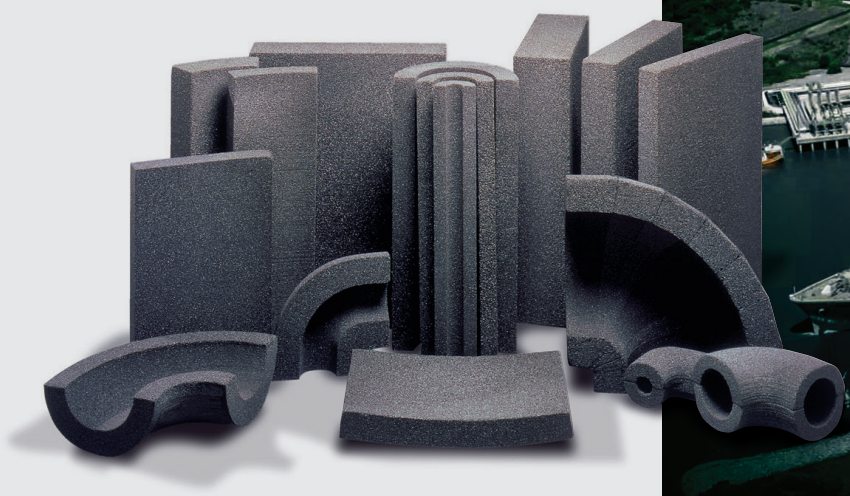


HHI fuel tank design approved by ABS

Shipbuilder Hyundai Heavy Industries has received approval from classification agency American Bureau of Shipping (ABS) for an IMO Type B LNG fuel tank design.

The conceptual fuel tank design was developed to minimize the loss of cargo space and effectively use available area on board a vessel. It is based on the New Panamax containership size with capacity for 14,5000 twenty-foot equivalent containers but can be adapted for other ship types and sizes.

"We are pleased to issue this approval that represents our involvement in the expanding gas fuel market and further promotes the adoption of LNG as fuel. As a technology leader, ABS works collaboratively with project stakeholders to evaluate new innovations and navigate the associated safety challenges," Christopher J. Wiernicki, CEO of ABS, said.

GDA approval paves way for construction

The tank received a certificate of General Design Approval (GDA) and was determined as in compliance with the relevant ABS Rules and Guides as well as the International Code of Safety for Ships using Gases or other Low-Flashpoint Fuels (IGF Code).

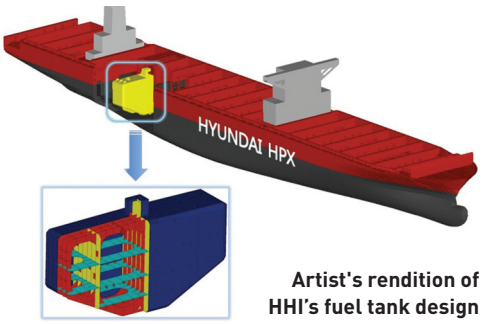
"Working with ABS as our advisor, we were able to prove and determine the feasibility of our Type B fuel tank design concept," Yun-Sik Lee, HHI Senior Executive Vice President, said. "Together, we applied the latest safety standards to the design, bringing us closer to incorporating this innovative fuel tank design into new containerships."

Ship-to-ship bunker study to improve best practice

HHI is currently collaborating with Korean shipbuilder Hyundai Mipo Dockyard (HMD) and technical services firm Lloyd's Register (LR) to complete compatibility studies into ship-to-ship LNG bunkering.

The proposed research aims to provide a comprehensive review of design requirements for ships ranging from 6,600 deadweight-tonne LNG bunkering ships to 14,000 TEU LNG-fuelled container ships as well as verifying safe ship-to-ship LNG bunkering practices.

HHI is the world's largest shipbuilding company with headquarters in Ulsan, South Korea. It operates seven business divisions covering: Shipbuilding, Offshore & Engineering, Industrial Plant & Engineering, Engine & Machinery, Electro & Electric Systems, Construction Equipment, and Green Energy. ■



Artist's rendition of HHI's fuel tank design

Shell releases LNG bunker vessel design

Energy major Shell has released details of its latest LNG bunker vessel design, featuring a specialised loading arm to provide safer bunkering for a wider range of ships.

The LNG bunker vessel will feature 6,500 cubic metres of storage and is designed to deliver fuel at a rate of 1,000 cubic metres of LNG per hour.

"It will be the biggest seagoing LNG bunker vessel with high maneuverability and will open up a new market in the marine transport industry… There is a need for more LNG infrastructure and a reliable supply chain," a spokesperson for Shell said.

The specialised loading arm will allow the vessel to provide safe bunkering to a wider range of ships, from small coastal to large transatlantic ships.

The new Shell LNG Bunker Vessel is contracted under the "ReaLNG project co-financed by the European Union's Connecting Europe Facility. The project aims to develop LNG as a commercial reality in the North Sea-Baltic region.

SCF deal to fuel giant LNG-fuelled vessels

Earlier this month, the firm Shell to supply the world's first LNG-fuelled Aframax tankers. The four giant tankers will be amongst the largest LNG-fuelled vehicles in operation on the planet and will operate in the Baltic Sea and Northern Europe transporting crude oil and petroleum products.

The ice-classed, dual-fuelled tankers will be operated by Russian operator Sovcomflot and are scheduled to come into operation beginning in the third quarter of 2018. Shell Western LNG will provide refuelling capabilities from a specialised LNG bunker vessel at the Dutch Gate terminal at the port of Rotterdam and from a second undisclosed supply point in the Baltics.

"This is an important next step for gas as part of the energy mix. We are proud to work with SCF Group to make these LNG-fuelled Aframax crude oil tankers a reality," Maarten Wetselaar, Integrated Gas and New Energies Director at Shell, said.

"This is another marine segment embracing the benefits of LNG fuel, making it clear that LNG will play a key role in helping the shipping industry meet new emissions regulations."

Shell has consistently backed the development of LNG fuelling infrastructure and as a founding member of technology consortium Project Forward has backed research into the supply of LNG fuelling solutions for globally-trading bulk carriers, tankers and container vessels. ■

Artist's rendition of Shell's LNG vessel design

NEWS NUDGE

SCF selects WinGD LNG-fuelled 7X62DF engines

Russia's largest shipping company, Sovcomflot (SCF) has awarded Winterthur Gas & Diesel (WinGD) a contract to supply dual-fuel engines for it the first ever LNG-fuelled Aframax crude oil tankers.

The 7X62DF engines will feature X-DF low-pressure gas admission and are rated 13,800 kilowatts at 86 revolutions-per-minute. The engines comply with IMO Tier III limits for oxides of nitrogen (NOx) in their gas fuel mode, and with IMO Tier II when burning liquid fuel.

"Reducing both CAPEX and OPEX, the low-pressure gas admission technology means that in contrast to engines with high-pressure gas injection, the gas fuelling system on the X-DF engines does not require high-pressure electrically-driven cryogenic pumps. This considerably reduces both the purchase and installation cost of the fuelling system and the consumption of electricity needed for injection of gas into the combustion chamber," a spokesperson for WinGD said.

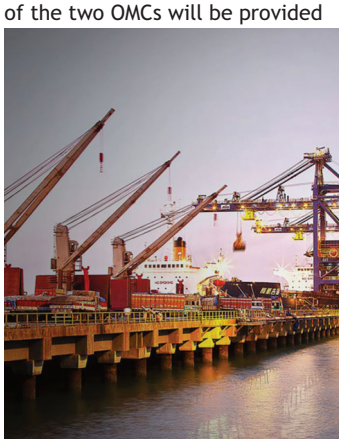
Swiss manufacturer, WinGD is a developer of low-speed gas and diesel engines used for propulsion power in merchant shipping. Its engines are utilized for the propulsion of various types of deep-sea ships, including oil and product tankers, bulk carriers, car carriers, general cargo ships and container ships. ■

India mulls Dharamtar Creek LNG bunker station

Authorities in India have announced plans to develop an LNG bunker station at Dharamtar Creek near Mumbai.

The proposed LNG facility would reportedly be similar to the station currently under development as part of the Haldia Dock Complex on the eastern coast.

"Discussions are going on with two oil marketing companies (OMCs) - Indian Oil Corporation Ltd (IOCL) and Bharat Petroleum Corporation Ltd (BPCL). Soon, one of the two OMCs will be provided with land on lease to have an LNG bunker," Atul Patne, CEO of Maharashtra Maritime Board (MMB) said in comments to local agencies.



The proposed bunker facility will serve the port of Dharamtar

The project is expected to develop as a joint venture between one of these OMCs and a private player. Two preliminary locations for the LNG bunker were identified at Mandwa and Dharamtar but it is believed the Dharamtar site is now the preferred option.

The MMB has two parcels of land available totalling 6 acres both suitable for refuelling either passenger boats or cargo vessels via Dharamtar Port, Mumbai Port (MbPT) or Jawaharlal Nehru Port.

LNG bunker commitment restated

Alongside the proposal for a new bunker station the ministry of shipping reiterated plans to provide tax incentives to promote usage of LNG as alternate fuel.

The Indian government has previously signaled its commitment to LNG bunker infrastructure with plans to develop a network of LNG-fuelled barges on the river Ganges by 2018.

"If a vessel sails between Mumbai-Goa and uses LNG as a fuel, the fuel cost saving will be up to 75%," Nitin Gadkari , India's shipping minister, said.

A Memorandum of Understanding (MoU) signed between Inland Waterways Authority of India (IWAI) and state-run energy firm Petronet LNG last year is expected to lead to wider use of LNG as a transport fuel for National Waterways in the country.

"IWAI and Petronet LNG have been asked to plan and coordinate their work plans in a manner such that LNG Barges could commence navigation on NW1 by December 2018," a ministry spokesperson said in a statement. ■

NEWS NUDGE

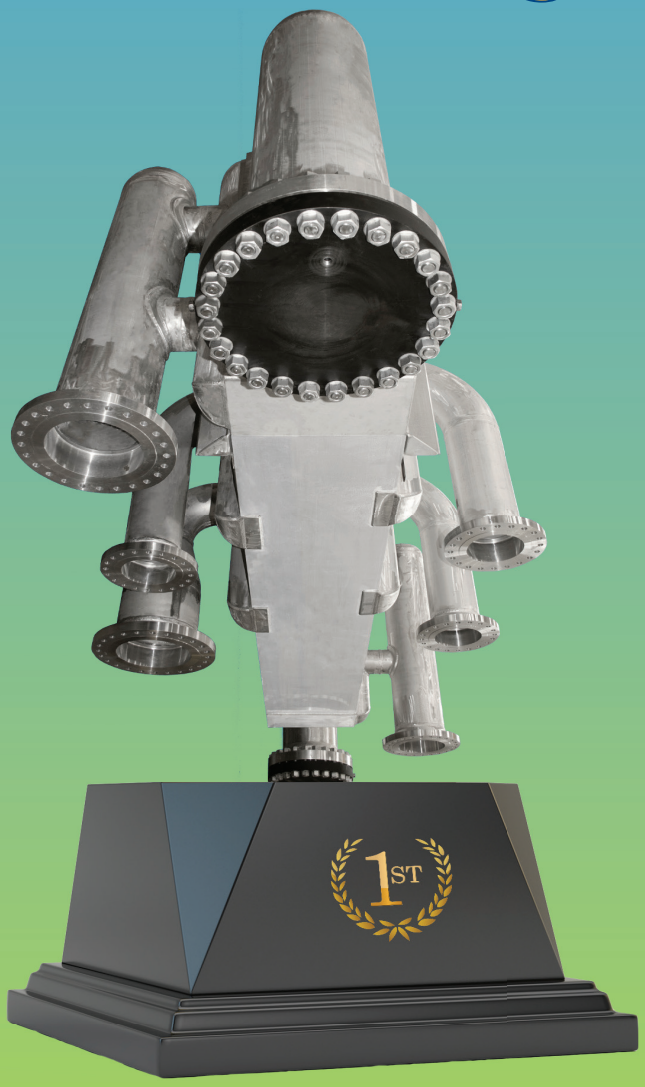
FGE predicts Asia LNG bunker growth

The LNG bunkering market may be poised for growth as LNG prices fall to historic lows, according to research constultancy FGE.

Speaking at the recent International Symposium on LNG Bunkering, FGE chairman Fereidun Fesharaki told local agenices that prices could fall to a low of around US$4 per MMBtu in the second half of 2018 as export projects in the U.S. and Australia add supply faster than demand can grow.

The outlook is likely to help investment in new LNG fuelling infrastructure as project developers see rising demand. ■

Chart Brazed Aluminum Heat Exchangers



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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	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

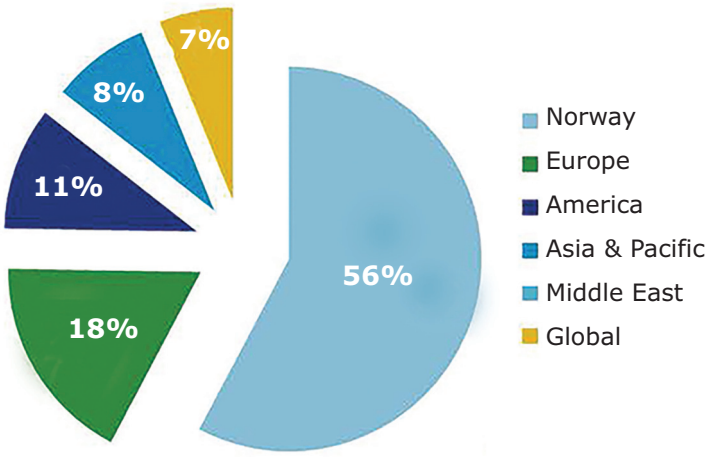
For more information please visit www.dnvgl.com
Data last updated: 15 February 2017
* = conversion projects

DNV·GL

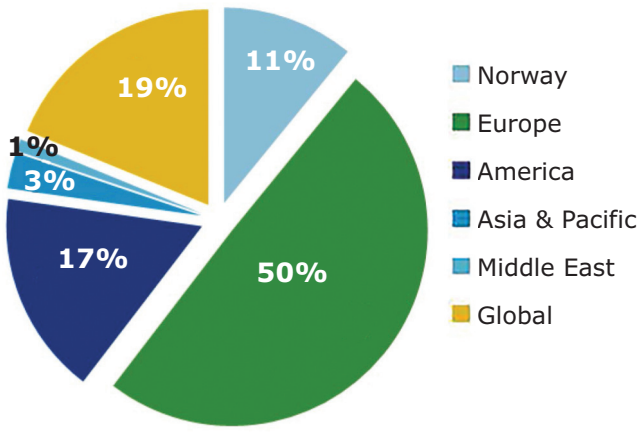
Year	Type of Vessel	Owner	Class
2015	Gas carrier	Evergas	BV
2015	Gas carrier	Evergas	BV
2015	Tug	CNOOC	CCS
2015*	Car/passenger ferry	AG Ems	DNV GL
2015	Tug	NYK	NK
2015	Gas carrier	Chemgas Shipping	BV
2015	Gas carrier	Evergas	BV
2015	PSV	Harvey Gulf Int.	ABS
2015	Container ship	TOTE Shipholdings	ABS
2015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

For more information please visit www.dnvgl.com
Data last updated: 15 February 2017
* = conversion projects

DNV·GL

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	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

DNV·GL

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	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 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 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	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	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	ENGIE Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
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 = 22 February 2017

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