

LNG Fuelling

AN LNG JOURNAL PUBLICATION

13 July 2017

Australia launches LNG Marine Fuel Institute

A coalition of Australian transport organisations and governmental bodies have opened the new LNG Marine Fuel Institute (LNG-MFI) in Perth, Western Australia.



The institute is dedicated to the enablement of LNG as “a primary fuel for marine transportation” and was officially launched in the national capital, Canberra. It will bring together key agencies, federal, state and industry regulators, as well as businesses throughout Australasia and has partnered with the Society for Gas as a Marine Fuel (SGMF).

“LNG MFI’s mission [is] to secure LNG as a marine fuel for the global maritime industry. It is the only organization of this type based in the Southern Hemisphere,” a spokesperson for the institute said.

LNG-MFI to promote energy independence

Australia is home to some of the largest reserves of natural gas in the world and giant production

projects such as the Gorgon gas and Ichthys LNG projects yet the country is more than 90% reliant on imported transport fuels.

The chairman of the new institute, Richard Sandover, now expects Australia may be “poised to leapfrog” impending regulations by establishing early adoption of LNG as a marine fuel and providing the Australasian maritime industry with a sustainable and cost effective fuel source.

“LNG MFI sees a future for LNG fuels, not only in the marine industry but also our road, rail and mining industries being fuelled by our own gas. For LNG MFI, it is about Australia gaining energy independence. Our CEO and director, Captain Walter Purio describes this as our ‘noble cause’ and he is right,” Sandover commented.

Australia to support green LNG route

Alongside the establishment of energy independence for the domestic transport sector the

LNG-MFI will also target growing demand for the fuel in China, Japan and Korea. As part of this strategy, the LNG-MFI is seen as a key element in the creation of a green trade route linking Australia with Asian ports.

“A number of OECD countries including China, USA, Canada, the Baltic States and the European Union have started the process. They have introduced even more stringent standards relating to emissions from ships sailing through their territorial waters,” Sandover explained, adding that Asian demand could lead to “a strong national LNG bunkering industry, the creation of jobs and enhanced fuel security”.

To achieve this, the institute will offer affiliates networking opportunities with industry professionals and opportunities for information exchange, industry insight and promotion of IMO’s MARPOL Annex VI mandate.



The LNG-MFI aims to boost uptake of the fuel in Australia

FUELLING NEWS AGENDA

BUNKER INFRASTRUCTURE

ExxonMobil, Eagle, Crowley sign LNG MoU **2**

Pitpoint.LNG announces bunkering station first for Germany **2**



LNG INDUSTRY GROUPS

MPA adds Ningbo, Marseille and Vancouver to LNG focus group **3**

REGULATION

LIQAL patents LNG dispenser technology **5**

IRClass publishes Indian LNG-fuelling rules **5**

IBERIA

DNV GL predicts “huge potential” for LNG fuelling in Iberia **6**



ExxonMobil, Eagle, Crowley sign LNG MoU

Energy firms ExxonMobil, Eagle LNG Partners and Crowley have signed a partnership agreement to collaborate on the development of LNG as a marine fuel.

The newly formed consortium will concentrate on “storage and technical support” solutions for LNG delivery for vessel operators in North America and will initially focus their efforts in Florida.

“The Memorandum of Understanding is another major step forward in developing LNG as a marine fuel. It will leverage the specialist knowledge and expertise

of ExxonMobil, Eagle LNG Partners and Crowley to the benefit of vessel operators bunkering in North America,” Luca Volta, LNG Venture Manager at ExxonMobil, said.

Eagle to build and operate small-scale facilities

Eagle LNG Partners will supply LNG fuel and design, build and

operate small-scale facilities as well as coordinate land-based LNG transportation while Crowley will provide bunker logistics and ensure safe and reliable operations.

“This agreement provides additional opportunities for vessel operators looking to adopt LNG as a marine fuel... The parties believe that the marine industry is heading for a multi-fuel future that will include low-sulphur options, with LNG an important part of that mix,” Volta added.

ExxonMobil to provide bunker sales expertise

As the largest of the three partners, ExxonMobil will provide technical support and expertise for

LNG bunker operations and sales, leveraging on its position as the world’s largest publicly traded oil and gas company.

“The goal is to establish the storage and technical support necessary to provide safe, reliable LNG delivery for vessel operators bunkering in North America,” a spokesperson for the consortium said.

Eagle LNG Partners is a wholly-owned subsidiary of Ferus Natural Gas Fuels and privately-held by The Energy & Minerals Group. The firm is one of the largest LNG infrastructure constructors in the U.S. supplying fuel for a range of marine, remote power, rail, oil and gas, and trucking projects.



Crowley ATB System

Pitpoint.LNG announces LNG bunkering station first for Germany

Gas infrastructure specialist Pitpoint.LNG is to build a new LNG bunkering station in the harbor of Cologne port, Germany.

The new facility will be the first of its kind in Germany and will enable bunkering of LNG-powered inland waterway vessels sailing on the river Rhine, Europe’s busiest transport waterway.

Long-term agreement to bunker Shell dual-fuel barges

The new LNG bunkering station is scheduled to start operation in mid-2018 when it will begin bunkering LNG for chartered inland dual-fuel barges under long-term agreement with Shell Western LNG.

“We are very pleased to start with the realization of this LNG bunkering station and to have Shell as a key launching customer. Enabling companies such

as Shell to transport and deliver their goods in a cleaner and more environmental friendly way supports PitPoint’s mission to realize 100% clean transport in 2030,” Jan Willem Drijver, Managing Director at PitPoint.LNG, said.

First shore-to-ship LNG bunkering station

The proposed LNG bunkering station will be the first shore-to-ship LNG bunkering station in Germany and also the first to serve traffic on the Rhine. PitPoint estimates that river traffic from countries along the Rhine accounts for 84% of goods transport by inland waterway in Europe.

PitPoint.LNG is a joint venture focused on the realization and



Artist's rendition of PitPoint LNG station

exploitation of LNG infrastructure for the automotive and marine market formed by PitPoint clean fuels and Primagaz Nederland.

“Together with the infrastructure developed in Rotterdam, this station will expand the availability of LNG

fuel for customers on the Rhine - Europe’s key inland waterway. We look forward to working with PitPoint.LNG to make this a reality,” Laurant Wetemans, Shell’s General Manager Downstream LNG, 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 Fuertes
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.”

MPA adds Ningbo, Marseille and Vancouver to LNG focus group

The Maritime and Port Authority of Singapore (MPA) has welcomed the ports of Ningbo-Zhoushan, Marseille Fos and Vancouver as the newest members to its LNG Bunkering Port Focus Group.

The new members will bolster efforts to enable the uptake of LNG as marine fuel and join seven existing other organisations participating in the focus group. The new members were announced at the recent 3rd Port Authorities' Roundtable event in Ningbo, China.

Chinese input to boost Intra-Asia uptake

The addition of Ningbo-Zhoushan Port to the group was welcomed as a fillip for potential growth of LNG as a fuel in Asian shipping given the size of the Chinese export market.

"We are pleased that at this meeting, three more ports, including the first Chinese port, will be joining the LNG Bunkering Port Focus Group... We are confident that the inclusion of Port of Ningbo-Zhoushan will add further impetus to enable the uptake of LNG bunkering for the Far East-Europe and Intra-Asia trade routes for the future," Andrew Tan, CEO of MPA said.

Vancouver to deepen Pacific trade links

As well as stronger uptake of LNG in Asian shipping the addition of the port of Vancouver to the group is also expected to drive cleaner shipping for the Trans-Pacific Trade.

"As the world's largest LNG importing country and also as the world's leading maritime countries, we believe that Japan has a responsibility to promote LNG as a marine fuel in order to acceler-

ate cleaner shipping... We are confident that the participation of the Port of Vancouver will bring a significant effect on accelerating cleaner shipping for the Trans-Pacific Trade due to its strategic location," Michio Kikuchi, director-general at Japan's MLIT, said.

Group expands to 11 members

Founded by the MPA, Antwerp Port Authority, Port of Rotterdam and Port of Zeebrugge the LNG Bunkering Port Focus group held its first full meeting in April 2017 in Yokohama, Japan, where members agreed to focus collaborative efforts on enabling the uptake of LNG as bunkers globally.

Alongside the founding port authorities and the new members, the focus group also includes the Port of Jacksonville, the Norwegian Maritime Authority, the



Andrew Tan of MPA and Cai Shengkang of Zhejiang Provincial Seaport Group

Ministry of Land, Infrastructure, Transport and Tourism, Japan and Ulsan Port Authority, Republic of Korea,

"Through this group, we believe strongly that we can work together to address safety requirements imposed by inter-

national organisations for LNG bunkering and barriers faced by ocean-going vessels looking to use LNG as a fuel in the future," Cai Shengkang, General Manager of Zhejiang Provincial Seaport Investment and Operation Group, said.



Delegates at the 3rd Port Authorities' Roundtable

"Through this group, we believe strongly that we can work together to address safety requirements imposed by international organisations for LNG bunkering and barriers faced by ocean-going vessels looking to use LNG as a fuel in the future"

Cai Shengkang, General Manager of Zhejiang Provincial Seaport Investment and Operation Group



LNG VALUE CHAIN SOLUTIONS

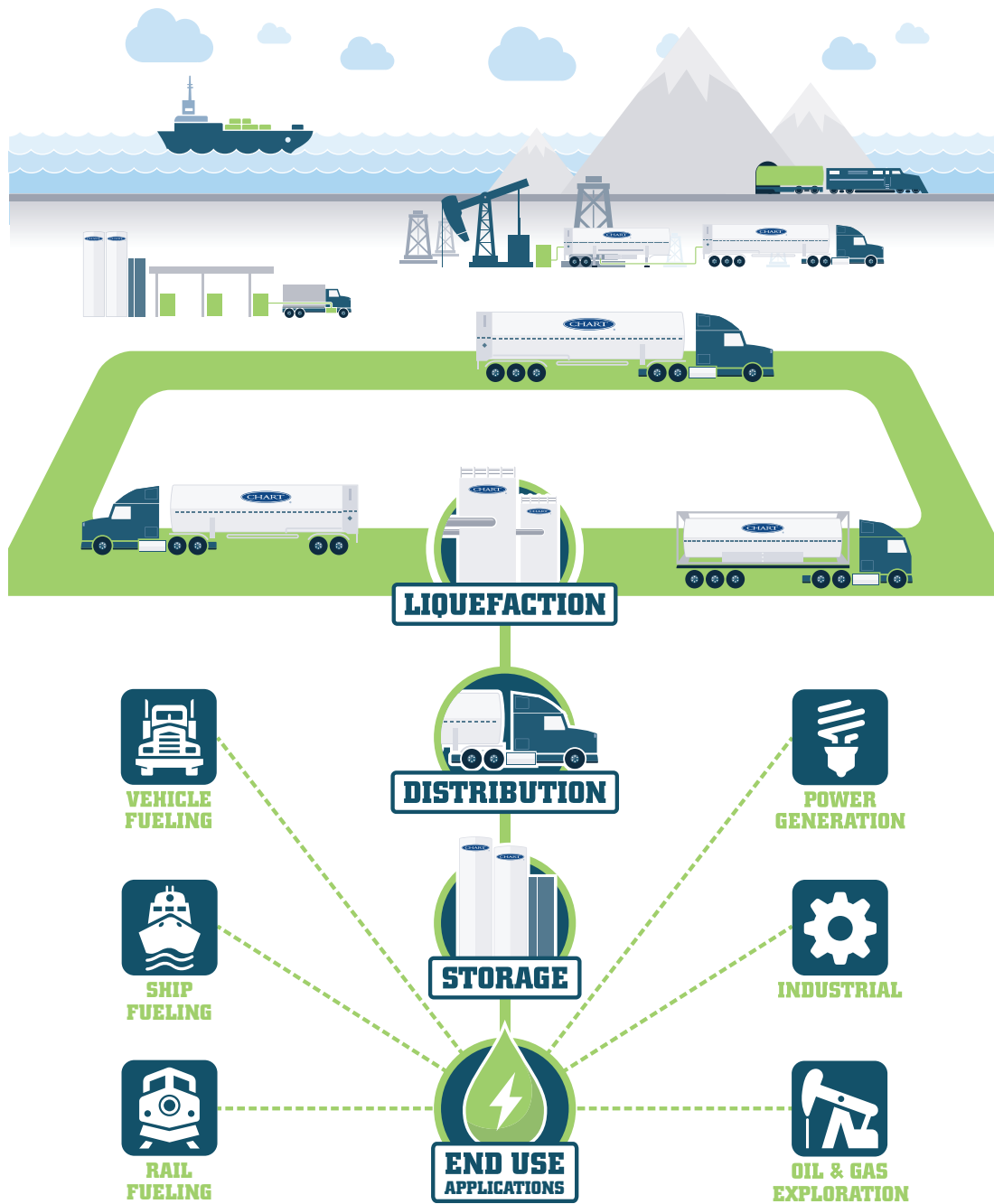


Chart is pioneering the adoption of LNG as a clean-burning, safe and economical fuel alternative for energy, transportation and industry.

www.ChartLNG.com

LIQAL patents LNG dispenser technology

LNG equipment developer LIQAL has obtained a patent for a new design of LNG dispenser that promises to improve the refuelling process for LNG-powered vehicles.

The patented nozzle docking bay is a unique system designed to “ensure tension-free connection and de-coupling of the nozzles” to and from LNG-powered vehicles. The layout of the bay is also designed to integrate the LNG dispenser in such a way as to extend the life of nozzle seals and hoses.

“The LNG fuel dispensers, designed and produced by LIQAL, are fully certified to operate on the European market and comply with the latest standards to sell LNG as transport fuel including the Measuring Instruments Directive (MID),” the company said in a statement.

LNG dispenser achieves 150 litres per minute

The LIQAL LNG dispenser system is capable of outputting liquid flow of 150 litres per minute and mass flow of 63 kilograms per minute.



LIQAL LNG dispenser

The firm’s LNG stations are designed and engineered according to Dutch PGS33-1, EN13645, ATEX 95 and 137, PED 97/23/EC, ASME VIII / AD2000, MID/OIML R 117-1 standards.

The patent further strengthens LIQAL’s portfolio of technology solutions of the LNG-fuelling process that includes a fully certified LNG dispenser line and LNG satellite plants for industrial applica-

tions as well as filling stations for delivering LNG as fuel to buses, trucks, ships or trains.

LNG portfolio for DBMO

LIQAL’s LNG stations are designed for unlimited holding time of LNG, zero product loss and zero methane emissions and can also include the option to dispense CNG, broadening the scope of refuelling applications.

Headquartered in Breda in the Netherlands, LIQAL acts as a Design, Build, Maintain and Operate (DBMO) company for turnkey small- and mid-scale LNG systems that serve the European market.

The firm also develops a wide range of alternative fuel technologies alongside LNG dispensers including liquefaction systems, satellite plants and H2 fuelling.

IRClass publishes Indian LNG-fuelling rules

Authorities in India have published new guidelines for the operation of LNG-fuelled vessels in the country’s waters.

The new rules published by independent ship classification society the Indian Register of Shipping (IRClass) and cover best practice for vessels travelling on inland waterways as well as ocean-going traffic. The new rules are designed to underscore “the increasing importance” of LNG as a transport fuel in India.

“These rules will help the maritime stakeholders to promote environmentally friendly fuels for coastal as well as inland vessels,” a spokesperson for IRClass said.

Guidelines based on ESTRIN and IMO IGF Code

The IRClass guidelines are based on a wide variety of international requirements and were developed following analysis of ESTRIN (European Standard laying down Technical Requirements for Inland

Navigation Vessels), the IMO IGF Code and through consultation with various stakeholders

“These new rules are developed based on several national standards as well as ISO standards,” a spokesperson said

The Indian government has previously announced its intention to support LNG as a transport fuel in the country through investment in import terminals and refuelling infrastructure. Private investment is also expected to remain a key pillar of the government’s strategy in the near term with the Ministry of Road Transport and Highways (MORTH) recently releasing a draft notification for the use of LNG as an automotive fuel.

IRClass introduces Pleasure Crafts guidance

Alongside the recent guidelines for LNG-fuelled vessel the IRClass has

also developed rules for Pleasure Crafts above 24 metres in length building on previous guidance that the organisation issued for smaller pleasure crafts and in response to a “pressing need” for regulation due to the “growing ownership of yachts in India”.

Headquartered in Powai, Mumbai, the Indian Register of Ship-

ping is a Non-Profit organisation and member of the International Association of Classification Societies (IACS). The IRClass acts on behalf of the Maritime Administration of the Indian government as the security organisation that determines compliance for Indian flag ships and port facilities.



India’s IRClass has published new rules for LNG-fuelled vessels

DNV GL predicts “huge potential” for LNG fuelling in Iberia

A new market study by standards agency DNV GL forecasts a “huge potential” for LNG as a marine fuel in the Iberian Peninsula.

The recently published study was conducted as part of the six-year CORE LNGas hive project and analyses future infrastructure requirements for the areas around Spain and Portugal, including parts of the Mediterranean, Atlantic and Gibraltar Strait peripheral regions.

“Through this market study we now have a strong decision basis to prepare the supply side on the Iberian Peninsula in meeting future demand for LNG bunkering at competitive conditions,” Fernando Impuesto, CORE LNGas hive project coordinator from Enagas, said.

Co-funded by the European Commission, the €33-million CORE LNGas hive project is coordinated by Enagas and includes recommendations for LNG supply chain development infrastructure at over 40 ports in the project area.

Compliance stimulating €1 billion CAPEX growth

The study’s authors note that although LNG-fuelled shipping is high on the agenda in the maritime industry, the market drivers are changing, from a cost driven demand towards compliance with emissions regulations becoming the main motivation.

The report predicts that in order to realize the required LNG supply chain by 2030, “about €1 billion of capital expenditures (CAPEX) investment will be needed, adding up to a total cost of €3.7 billion in 2050.”

From a logistics perspective this will include the development of new breakbulk capacity at existing LNG terminals for



Artist's rendition of HHIC LNG bunkering concept

loading LNG to small carriers and LNG bunker vessels.

Algeciras, Las Palmas and Barcelona to become key LNG hubs

“In most ports, development of local intermediate storage capacity needs to be synchronized with increasing LNG demand by larger vessels. Besides bunker stations and

local storage facilities, small carriers for delivering batches of LNG to ports over sea will play an important role for the times ahead,” a spokesperson for DNV GL said.

Consolidated quantitative results from the study forecast that Algeciras, Las Palmas and Barcelona will become the main bunkering hubs in Iberia and that by 2030 up to 2 million cubic metres per year (m³/y) of LNG will be bunkered by ships in the area rising to 8 million m³/y by 2050.

“DNV GL’s market study has clearly shown the major potential LNG has as a fuel in the region. We hope that the conclusions from our study will help ship owners, natural gas suppliers, bunker companies, port authorities and LNG terminal operators gain the confidence they need to move forward with LNG as a fuel for a more sustainable shipping industry,” Liv Hovem, Senior Vice President, DNV GL - Oil & Gas, said.



The port of Barcelona is predicted to become one of the main Iberian LNG bunkering hubs

NEWS NUDGE

Japanese ports of Yokohama and Kawasaki join SEA\LNG consortium

Industry coalition SEA\LNG has added Yokohama-Kawasaki International Port Corporation (YKIP) as its latest member, representing the Japanese ports of Yokohama and Kawasaki.

“From a geographical perspective, the ports of Yokohama and Kawasaki are perfectly placed to serve as the first or last bunkering points on the Asian side of the Trans-Pacific route,” Masamichi Morooka, CEO of Yokohama-Kawasaki International Port Corporation said.

Since 2015, the port of Yokohama has accommodated an LNG-fuelled tugboat, NYK-owned Sakigake, and now aims to encourage adoption of LNG across the globe through increased awareness of the advantages for ports.

Bakker Slidrecht to supply Spartacus systems

Engineering firm Bakker Slidrecht is to supply electrical power systems for the world’s first LNG-fuelled cutter suction dredger (CSD) vessel.

The systems will deliver for 44.180 kilowatts for the vessel, Spartacus, and will be integrated by shipbuilder Royal IHC.

The contract includes engineering, delivery, and commissioning of the entire electrical power plant and auxiliary electrical installations.

Total to supply LNG for Honfleur cruise ferry

Total Marine Fuels Global Solutions (TMFGS) has signed a multi-year contract to supply LNG bunker to Brittany Ferries in France.

The contract relates to the recently ordered vessel Honfleur that will operate between Ouistreham, France and Portsmouth, England. It will start operations from 2019 and be refuelled at Ouistreham.

WORLD LNG-FUELLED CONFIRMED NEWBUILDS

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

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

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

Data last updated : 15 February 2017

* = conversion projects

LNG-FUELLED SHIPS IN OPERATION WORLDWIDE

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

For more information please visit www.dnvgl.com

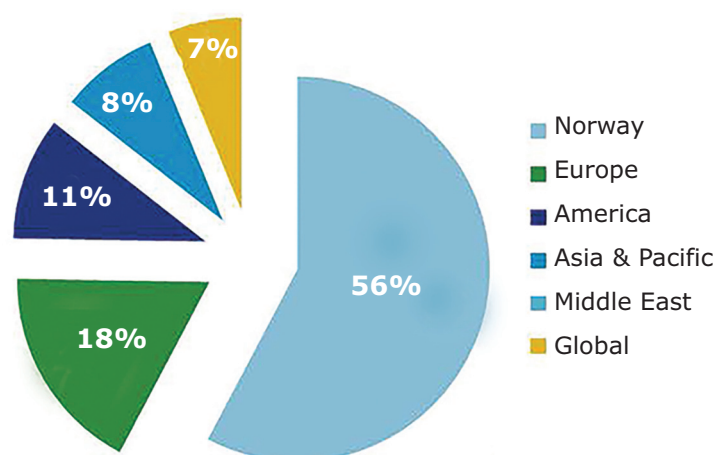
Data last updated: 15 February 2017

* = conversion projects

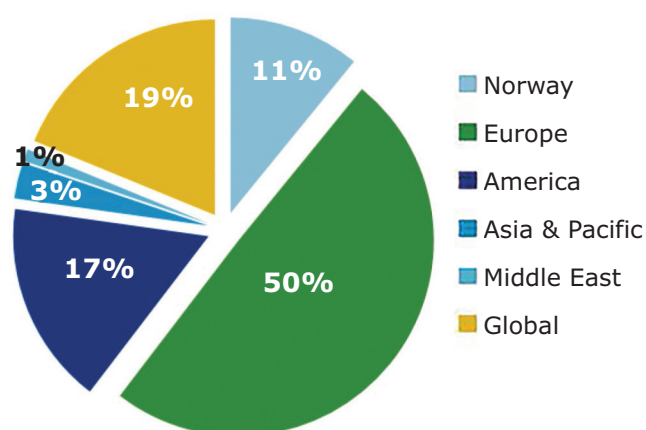
Year	Type of Vessel	Owner	Class
2015	Gas carrier	Evergas	BV
2015	Gas carrier	Evergas	BV
2015	Tug	CNOOC	CCS
2015*	Car/passenger ferry	AG Ems	DNV GL
2015	Tug	NYK	NK
2015	Gas carrier	Chemgas Shipping	BV
2015	Gas carrier	Evergas	BV
2015	PSV	Harvey Gulf Int.	ABS
2015	Container ship	TOTE Shipholdings	ABS
2015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

AREA OF OPERATION OF LNG-FUELLED SHIPS

Operating area
ships in operation



Operating area
confirmed orderbook



Updated 15 February 2017
Excluding LNG carriers and inland waterway vessels

WORLD SMALL SCALE LNG FLEET*

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
1974	Seagas	187	LNG	Sweden	Yes	AGA
1988	Kayoh Maru	1,517	LNG	Japan	Yes	Daiichi
1993	Aman Bintulu / Lucia Ambition	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1996	Surya Aki	19,475	LNG	Indonesia - Japan	Yes	MCGC
1997	Aman Sendai	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1998	Aman Hakata	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	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?
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 Innvation	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Inspiration	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	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	Gaschem Beluga	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Gaschem Orca	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services

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 = 24th May 2017

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
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	Yuan He 1	30,000	LNG	China	Yes	CSR
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	JS Ineos Invention	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	JS Ineos Intuition	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	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
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2021	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas

For more information please visit <http://small-lng.com>

*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less

TBN = To Be Nominated indicates ships are still at construction/planning stage

** = project shelved † = Data to be verified Data last updated = 24th May 2017

Small-LNG.com

LNG Journal & Gas to Power Journal Subscription Package



The journals' comprehensive coverage is dedicated to the entire gas-value-chain. In addition to our LNG Journal & Gas to Power Journal Daily newsletters, each platform provides exclusive, accurate and up-to-date news and analysis divided in the following sector-focused publications:

- LNG Journal - Monthly issues
- Gas to Power Journal - Daily e-newsletter + PDF
- LNG Unlimited - Weekly magazine + PDF
- LNG Shipping News - Fortnightly e-newspaper + PDF
- LNG Fuelling - Fortnightly e-newspaper + PDF
- LNG North America - Monthly e-newspaper + PDF

United Kingdom GBP 750
Europe and Africa EUR 925
Asia and Americas USD 1150

Multiuser options under request
**new subscribers only

For further information on subscribing please contact us at elena@lngjournal.com or + 44 20 7017 3416