

LNG Fuelling

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SGMF signs framework agreement with SEA\LNG

Multi-sector industry coalition SEA\LNG has signed a memorandum of understanding with the Society for Gas as a Marine Fuel (SGMF).

The agreement will help to crystallize working arrangements between the two complementary organisations and ensure a coordinated approach to their common goal of making LNG the fuel of choice for the shipping industry.

Collaboration to encourage greater data sharing

The MoU will develop a “framework for effective cooperation” and is designed to lead to wider sharing of “knowledge, data, and information” from each organisations area of responsibility.

“The 100 plus members of SGMF represent the whole value chain from supply to end use and our focus remains on safety, technical, contractual, training and competence, environment and gas as fuel industry information,” Mark Bell, general manager and COO of SGMF, said.

SGMF expects to benefit from leveraging SEA\LNG’s more commercial focus while providing more input on safety and regulatory aspects. SGMF through its governance develops guidelines, industry statistics, and studies and the MOU will allow the organization to coordinate with of SEA\LNG’s remit to educate investors and key stakeholders in



Representatives from SGMF and SEA\LNG signing the MoU

the marine transportation value chain.

“Through our work on the safety and technical aspects of LNG, SGMF remains wholly focused on promoting safe and responsible operations for gas fuelled ships,” Bell added.

SEA\LNG seeks global LNG value chain by 2020

This MoU will ensure that our efforts are concentrated on defined areas, enabling us to support each other successfully, and ultimately providing the confidence and demand required for an effective, efficient, and safe global marine LNG value chain by

2020,” Peter Keller, chairman of SEA\LNG, said.

SEA\LNG has expanded rapidly since its inception last year and now numbers 23 member companies, including ABS, Carnival Corporation, DNV GL, Eagle LNG Partners, ENGIE, ENN Group, GE, GTT, JAX LNG, Keppel Gas Technology, Lloyd’s Register, Mitsubishi, NYK Line, Port of Rotterdam, Qatargas, Shell, Total, TOTE, Toyota Tsusho, and Wärtsilä.

“SEA\LNG and SGMF have separate but complementary missions, and we are both wholly committed to the development of natural gas as a marine fuel,” Keller added. ■

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UPS invests US\$90 million, expands LNG fleet

Global logistics firm United Parcel Service (UPS) has announced plans to add 50 LNG-fuelled vehicles to its fleet, an additional six compressed natural gas (CNG) fuelling stations and 390 new CNG vehicles.

The investment will total US\$90 million and is expected to cement the firm's position as one of the largest logistics fleet operators in the alternative fuel market. The backing of LNG-fuelled vehicles by the world's largest package delivery company is likely to boost confidence in the sector.

"We know the importance of investing in natural gas globally for our fleet and the alternative fuel market. In 2016, we used more than 61 million gallons of natural gas in our ground fleet, which included 4.6 million gallons of renewable natural gas," Mark Wallace, UPS senior vice president

global engineering and sustainability, said.

Last year, UPS purchased 50 additional LNG vehicles that were deployed next existing UPS LNG stations in Indiana, Illinois, Missouri and Tennessee.

Rolling Laboratory to study LNG operations

Alongside its investments in LNG and CNG infrastructure UPS is also researching improvements to the technology via its Rolling Laboratory project which is designed to determine the right alternative fuel solutions for specific environments.

UPS deploys more than 8,100

vehicles in the Rolling Lab and currently runs CNG vehicles in 38 states in the U.S. in addition to vehicles in Germany, the Netherlands and Thailand.

The investment will include six new CNG stations to be built in California, Florida, Kansas, Kentucky, North Carolina and British Columbia. Renewable natural gas (RNG) will be used at the station in Ontario to fuel UPS vehicles in the area with renewable compressed natural gas (RCNG).

RNG, also known as biomethane, will be derived from



UPS LNG tractor being fueled

abundant renewable sources such as decomposing organic waste in landfills, wastewater treatment and agriculture. ■

Van Oord places order for first LNG-fuelled crane vessel

Dutch engineering specialist Van Oord has ordered its first LNG-fuelled crane vessel, *Werkendam*.

The 68-metre-long vessel will be constructed by Dutch shipbuilder Neptune in Hardinxveld-Giessendam, the Netherlands, and is expected to take about twelve months to build.

It will feature a 38 cubic metre tank on the aft deck for LNG storage, sufficient to sail and operate for fourteen days without bunkering.

The *Werkendam* will feature

three 475 kilowatt LNG-powered generators and a hopper capacity of 700 cubic metres with two electric-powered spud poles. The heavy-lift four-rope grab crane will have lifting capacity of 20 tonnes at 20 metres and 25 tonnes at 16 metres.

Van Oord researches LNG future

Based in Rotterdam in the Netherlands, Van Oord is one

of the largest dredging, marine engineering and offshore solutions providers worldwide. The firm operates a fleet of over a hundred heavy-lift dredging vessels and other specialised equipment.

Currently Van Oord's fleet predominantly runs on traditional fuel oil but a successful trial of LNG would likely spur widespread uptake as many of the firm's dredging projects are located close to environmentally sensitive or densely populated areas.

"Energy efficiency is one of the top items on our sustainability agenda... With this investment, we will be gaining experience of LNG-powered vessels and the related benefits," Jaap de Jong, Staff Director of Ship Management at Van Oord, said.

Energy monitoring to identify overcapacity gaps

The *Werkendam* will be equipped with a variety of sensors and energy storage systems providing data on operations and monitoring energy consumption of almost all of the equipment and systems on board.

Van Oord expects to use this data to identify and reuse overcapacity, for example when operating the crane. The data produced by these monitoring systems will provide crew members with an insight into energy consumption, enabling them to respond appropriately.

"To reduce our carbon footprint, we are researching the use of alternative fuels, such as LNG and biofuel," Jaap de Jong, Staff Director of the Ship Management Department at Van Oord. ■



Artist's rendition of the *Werkendam*

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Crowley Breaks Ground On Talleyrand Bunker Station

Marine solutions and energy services firm Crowley Maritime has broken ground on its new shore-side LNG bunker station at Jaxport Talleyrand Marine Terminal in Jacksonville.

The LNG bunker station is under construction on a two acre site at the port and will serve two new LNG-fuelled container/Roll-on, Roll-off (ConRo) vessels that Crowley will add to its fleet later this year.

"The start of construction marks a milestone as we continue making progress with our partners, supplier Eagle LNG and Chart Industries, manufacturer of cryogenic storage tanks," Matt Jackson, vice president, LNG at Crowley, said.

Specialist equipment manufacturer Chart Industries will supply two of its Decinske Giant cryogenic LNG storage tanks for the site. Each tank weighs 260 tonnes and has capacity hold one million litres of LNG. Both tanks are currently en route to Jacksonville from Europe and Crowley expects

the first tank to be installed within the next month.

Shipping demand to drive LNG to 30 MPTA by 2030

The ConRo ships are set to enter service in the second half of 2017 and first half of 2018, respectively, and will be supplied by LNG from Eagle Partners nearby liquefaction facility.

"Because of its multiple bene-

fits, including being cleaner for the environment, we expect LNG demand for ship fuel to increase to 30 million tons a year (MPTA) by 2030. We recognize Crowley's leadership as an early adopter of this fuel," Sean Lalani, Eagle LNG President, said.

Jacksonville aims to become regional LNG hub

The project is one of several devel-

opments in the Jacksonville area, designed to reinforce the regional LNG infrastructure. The Eagle Partners liquefaction facility will open this year delivering an initial 87,000 gallons of LNG per day and ramping up to an eventual capacity of 200,000 gallons per day.

Crowley is investing more than US\$550 million in the new LNG-fuelled ships, the bunker station as well as investing in a new 900-foot pier, three new gantry cranes and a multitude of terminal improvements at its Isla Grande terminal in San Juan, Puerto Rico.

"Our new Jaxport bunkering terminal will support efficient operations with state-of-the-art technology for bunkering operations .. [and] is part of our US\$550 million commitment class project for the U.S. and Puerto Rico trade," Jackson added. ■



Construction is underway at the Jaxport site

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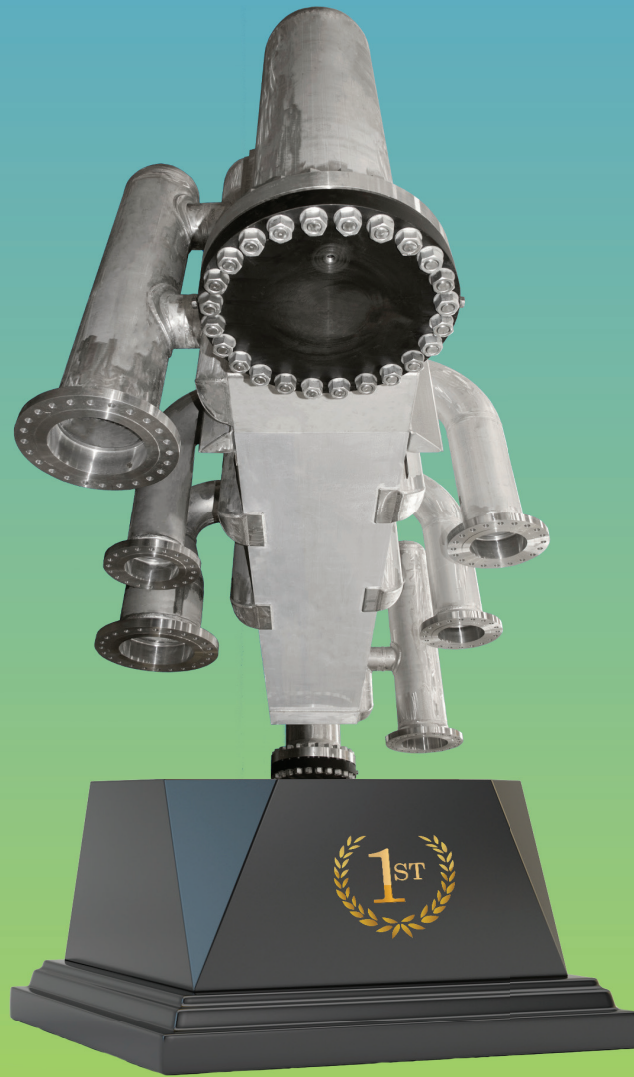
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KOGAS Signs LNG Bunker MoU

Energy firm Korea Gas Corporation (KOGAS) has signed a memorandum of understanding with a trio of LNG specialists to jointly develop a protocol for LNG bunkering in South Korea.

The agreement includes cargo containment system manufacturer KC LNG Tech, shipbuilder Samsung Heavy Industries and standards agency DNV GL and will focus on improving the safety of LNG vessels and facilities, as well as the design of ship-to-ship delivery processes.

The MoU with state-run KOGAS follows a commitment last year by the firm to invest US\$9 million in the development of LNG bunkering infrastructure at Tongyeong, in South Gyeongsang Province, South Korea. The Tongyeong project includes new loading arms and a new quay for a bunker facility which is expected to be complete by 2019.

Shipbuilding legislation to drive LNG vessel growth

South Korean authorities have long been vocal in their support for LNG-fuelled transport as a means to counteract the decline of the country's shipbuilding sector, which has been decimated in recent years.

The implementation of regulatory and financial incentives aimed at driving shipbuilding orders for newbuild LNG-fuelled vessels has had some success and by 2025, the government aims to increase South Korean shipyards' market share of newbuild LNG-powered vessels to 70 percent

globally, from the current 60 percent

"Currently, 26 public-purpose ships are being designed. We are considering whether to build some of them into LNG-powered ships," Kim Gyu-serb, deputy director at the Ministry of Oceans and Fisheries, said.

KOGAS seeks contractual flexibility

Proposals to revise current regulations on LNG bunkering have also been tabled by KOGAS with a view to having new frameworks in place soon and completing ship-to-ship



Representatives from KOGAS at the sign ceremony

LNG protocols within the year.

One of the key changes is greater flexibility for LNG contracts to provide more leeway to trade LNG cargoes. KOGAS chief executive Lee Seung-hoon has called for the removal of destination clauses in long-term import contracts to allow the firm greater choice in whether it uses or resell cargoes. ■

HSHI to build four LNG-fuelled tankers

Korean firm Hyundai Samho Heavy Industries has reportedly signed a shipbuilding contract valued at US\$240 million with Russian shipping line Sovcomflot (SCF) group for the construction of four ice-class, LNG-powered tankers.

The Aframax tankers are expected for delivery in stages from late 2018 to early 2019 and will be chartered to Shell for the transport of crude oil cargoes.

Each vessel will weigh 114,000 deadweight-tonnes and will join Sovcomflot's existing charter fleet of eight LNG carriers and four LPG carriers.

LNG cost endorsed despite 'testing' markets

The new LNG-fuelled tankers are under construction at a reported premium of US\$10.5 million each, compared with conventional Aframax tankers. The additional cost was deemed worthwhile by SCF despite 'severely testing' market conditions.

The organisation reported a 9% fall in revenues last year as net profits slid to just US\$206.8 million, compared with US\$354.5 million in 2015.

"Sovcomflot has delivered a solid set of results for 2016, despite market volatility in a year that has severely tested our industry...2016 witnessed a material

softening in demand that impacted negatively spot tanker freight rates, albeit with some respite in the final quarter," Sergey Frank, CEO of SCF Group said.

Against this backdrop SCF's decision to order four new LNG-fuelled vessels at a price premium is likely to be seen as a boost for confidence in the LNG fuel futures.

Arctic ice melt driving LNG vessel demand growth

As many shipping firms explore new routes via the Arctic the demand for new ice-class, LNG vessel designs is expected to grow. Routes such as the Transpolar Sea Route, Northeast passage or Northern Sea Route have traditionally been im-

passable for much of the year but global warming in recent years has had a drastic effect on sea ice, causing it to recede dramatically in summer and clearing the way for the passage of tankers through large areas of the arctic.

Sovcomflot recently completed Arctic sea trials on the world's first ice-class LNG carrier, the *Christophe de Margerie*. This vessel has capacity for the 172,600 cubic meters of LNG and will deliver cargoes year-round from Russia's Yamal project via the Arctic.

"The *Christophe de Margerie*, which is designed to sail through ice of 2.1-metre thickness, needs to prove it can break ice of at least 1.5 metres," a spokesperson for SCF said. ■



The *Christophe de Margerie*

NEWS NUDGE

Peace Boat unveils LNG-fuelled Ecoship designs

Non-governmental organization Peace Boat has reported that it is in the final stages of talks with a shipyard to construct its flagship LNG-fuelled vessel, the Ecoship, as it unveiled further aspects of the design concept.

Founder and director Yoshioka Tatsuya told delegates at the Seatrade Cruise Global conference that Peace Boat was "very seriously negotiating" with a shipyard and revealed that the vessel will feature technology to generate electric power via the flooring, through the harvesting of harvest kinetic energy.

Headquartered in Japan, Peace Boat's mission is to raise awareness and build connections internationally for peace, human rights, environmental protection and sustainable development. The use of LNG to power the Ecoship is seen as a key part of the NGO's undertaking.

"The Ecoship is the culmination of a 3-year, integrative design process by an international team harnessing expertise from both marine and land-based sectors. The project addresses the responsibility of maritime transport for carbon reduction and ocean protection," a Peace Boat spokesperson said. ■

Algoship receives LNG design concept approval

Design concepts by Algoship Designers for the LNG-fuelled *Seatransporter-DF* vessel have received Approval in Principle (AIP) from classification and technical services agency American Bureau of Shipping (ABS).

The design has the capability to accommodate multiple engine types as well as Type-C or membrane containment systems for LNG fuel and the approval paves the way for Nassau-based Algoship to begin construction of a prototype of the dual-fuel vessel.

"Technically innovative designs that advance the use of LNG as fuel will play an increasingly important role in the marine sector, and ABS is working alongside industry to enable this critical technological ad-

vancement," Dr. Kirsi Tikka, executive vice president at ABS, said.

The *Seatransporter-DF* design is compliant with Emission Control Areas (ECA) and was developed in partnership with LNG specialist CleanShips of Stamford, Connecticut.

LNG fuel to play "increasingly important" role

Both firms have previously worked on a range of bulker and tanker vessel designs and believe the introduction of LNG as a fuel in the design process will become increasingly important for

future contracts.

"As industry considers future fuel strategies, design concepts that promote the use of LNG as fuel will play an increasingly important role in that mix," Tikka added.

The *Seatransporter-DF* design will feature a 2,400 cubic metre LNG fuel containment system and will be 38,000 deadweight-tonnes. Algoship devised the new vessel in line with its design philosophy for larger Panamax, Ultramax and Kamsarmax sized carriers and estimates that the LNG storage features will allow for approximately 100 days endurance.

ABS pursues LNG fuelled bulker goal

ABS' work designing *Seatransporter-DF* builds on involvement in the Project Forward consor-

tium, which aims to develop the first commercial LNG-fuelled dry bulk carrier vessels.

"ABS contributed to this effort as a trusted advisor, engaging early in the process to apply its rigorous engineering and safety standards and verify the feasibility of the design," Antony Prince, president of Algoship Designers, said.

Alongside ABS, the consortium includes Greek bulk carrier Arista Shipping, ship designer Deltamarin, engine manufacture Wärtsilä, LNG membrane containment firm GTT and energy company Shell.

"By working with ABS through its AIP process, we've been able to demonstrate that the *Seatransporter* was developed with a focus on safety and reliability and will be able to satisfy flag and port state requirements," Prince added. ■



Seatransporter-DF

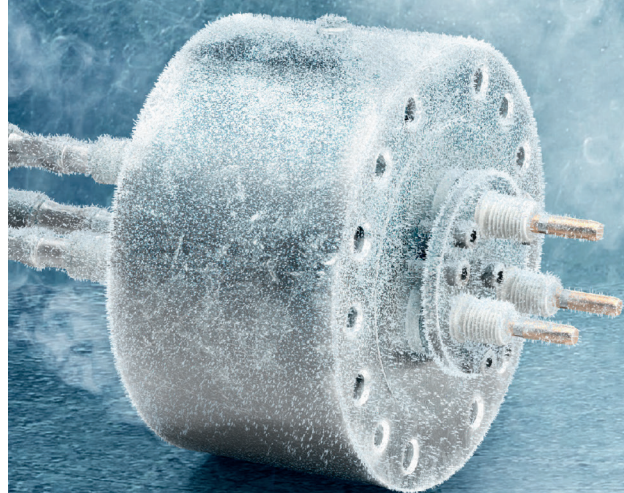
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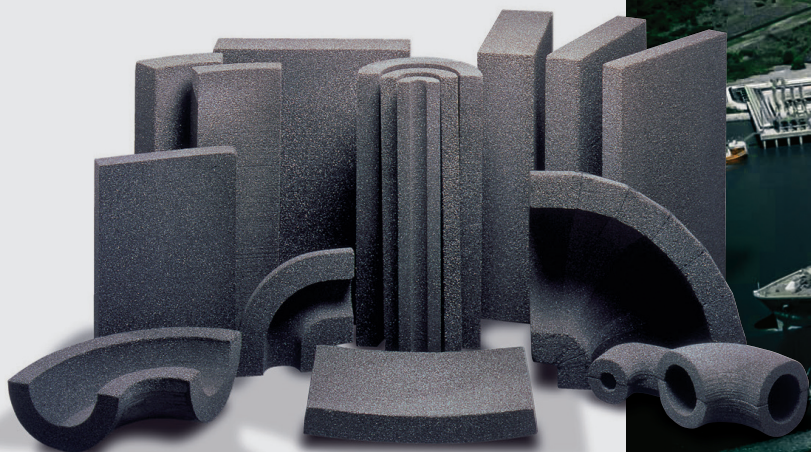
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LNG-FUELLED SHIPS IN OPERATION WORLDWIDE

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	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

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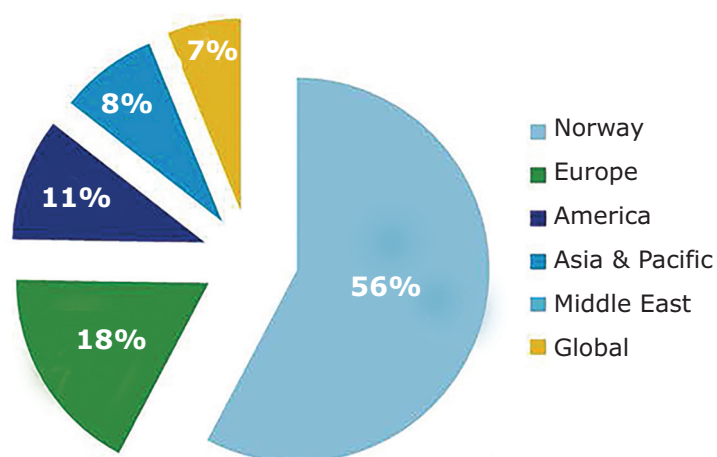
Data last updated: 15 February 2017

* = conversion projects

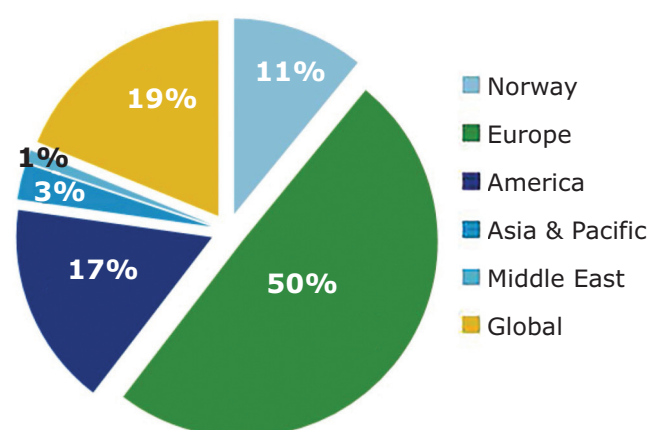
Year	Type of Vessel	Owner	Class
2015	Gas carrier	Evergas	BV
2015	Gas carrier	Evergas	BV
2015	Tug	CNOOC	CCS
2015*	Car/passenger ferry	AG Ems	DNV GL
2015	Tug	NYK	NK
2015	Gas carrier	Chemgas Shipping	BV
2015	Gas carrier	Evergas	BV
2015	PSV	Harvey Gulf Int.	ABS
2015	Container ship	TOTE Shipholdings	ABS
2015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

AREA OF OPERATION OF LNG-FUELLED SHIPS

Operating area
ships in operation



Operating area
confirmed orderbook



Updated 15 February 2017
Excluding LNG carriers and inland waterway vessels

WORLD 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

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 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	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