

MARITIME

LNGi status update

Comprehensive insights on worldwide LNG bunkering availability and market data on LNG as fuel for ships

08 March 2017



LNGi

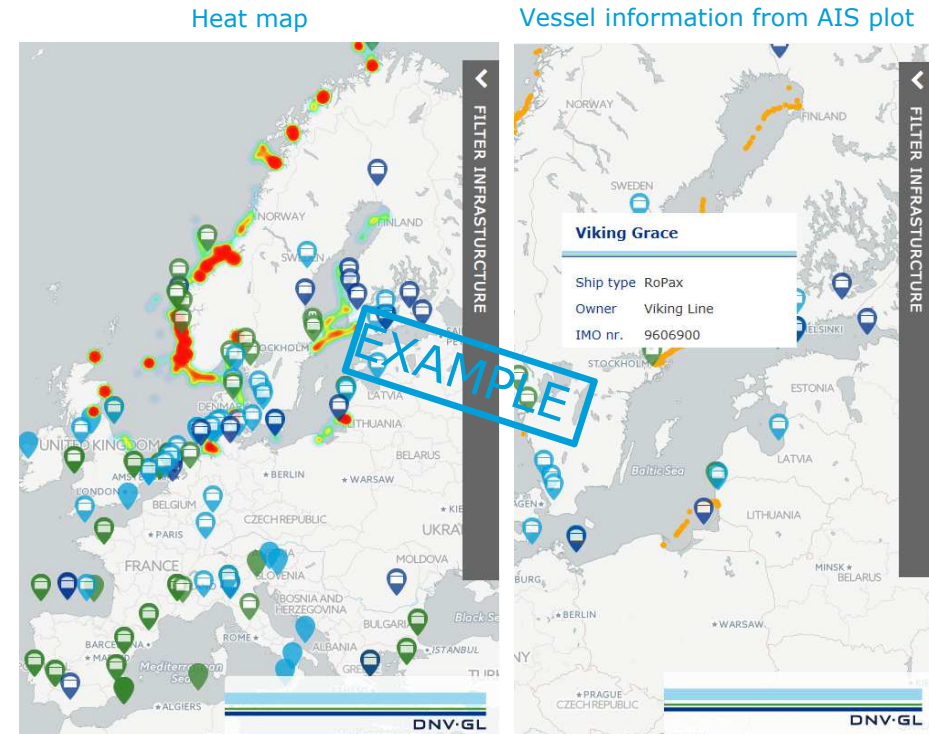
Collaboration for increased uptake of LNG as fuel

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LNGi keeps you on top of the development of LNG bunkering for ships

LNGi

- ✓ **Map** with LNG bunkering infrastructure with **detailed** project data
- ✓ Heat map and vessel positions of LNG fuelled fleet operating area using **AIS**
- ✓ Detailed **statistics** of LNG fuelled **fleet** development
- ✓ Scrubber + alternative fuels overview
- ✓ LNG related studies and publications



The heat map and vessel positions are based on AIS data from 01.03.2016-11.03.2016

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LNGi members – Contributing to the uptake of LNG as ship fuel

- Brodosplit
- Carnival Cruises
- Caterpillar
- CMA Ships
- ENGIE
- GTT
- MAN
- MPA Singapore
- Oil major
- Rolls Royce
- SGMF
- Shell
- Shipowner
- Skangas
- UASC
- Wärtsilä
- WinGD

DEMAND

Status for LNG fuelled ships

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99 LNG fuelled ships in operation worldwide (1/2)

Ships in operation

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

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Ungraded * *Conversion project*

Excluding LNG carriers and inland waterway vessels

99 LNG fuelled ships in operation worldwide (2/2)

Ships in operation

Year	Type of vessel	Owner	Class	Year	Type of vessel	Owner	Class
2014	PSV	Remøy Shipping	DNV GL	2016	Oil/chemical tanker	Terntank	BV
2014	General Cargo	Egil Ulvan Rederi	DNV GL	2016	Gas carrier	Navigator Gas	ABS
2014	General Cargo	Egil Ulvan Rederi	DNV GL	2016*	Oil/chemical tanker	Furetank Rederi	BV
2014	PSV	Siem Offshore	DNV GL	2016	Icebreaker	Arctica Shipping	LR
2015	PSV	Harvey Gulf Int.	ABS	2016	Car/passenger ferry	Boreal Transport Nord	DNV GL
2015	Ro-Ro	Norlines	DNV GL	2016	Car/passenger ferry	Boreal Transport Nord	DNV GL
2015	Car/passenger ferry	Samsøe municipality	DNV GL	2016	Tug	CNOOC	CCS
2015	PSV	Simon Møkster Shipping	DNV GL	2016	Gas carrier	Chemgas Shipping	BV
2015	PSV	Siem Offshore	DNV GL	2016	Car carrier	UECC	LR
2015	Ro-Ro	Norlines	DNV GL	2016	Oil/chemical tanker	Terntank	BV
2015*	Oil/chemical tanker	Bergen Tankers	LR	2016	Oil/chemical tanker	Terntank	BV
2015	Car/passenger ferry	Society of Quebec ferries	LR	2016	Car/passenger ferry	BC Ferries	LR
2015	Gas carrier	Evergas	BV	2016	Gas carrier	Evergas	BV
2015	Gas carrier	Evergas	BV	2016	PSV	Siem Offshore	DNV GL
2015	Tug	CNOOC	CCS	2016	Car/passenger ferry	Seaspan Ferries Corp.	BV
2015*	Car/passenger ferry	AG Ems	DNV GL	2016	Gas carrier	Navigator Gas	ABS
2015	Tug	NYK	NK	2016	Ro-Ro	Searoad Holdings	DNV GL
2015	Gas carrier	Chemgas Shipping	BV	2016	Car carrier	UECC	LR
2015	Gas carrier	Evergas	BV	2017	Gas carrier	Navigator Gas	ABS
2015	PSV	Harvey Gulf Int.	ABS	2017	Car/passenger ferry	Seaspan Ferries Corp.	BV
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				

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Excluding LNG carriers and inland waterway vessels

93 confirmed LNG fuelled newbuilds (1/2)

Confirmed orderbook

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

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Ungraded * *Conversion project*

Excluding LNG carriers and inland waterway vessels

93 confirmed LNG fuelled newbuilds (2/2)

Confirmed orderbook

Year	Type of vessel	Owner	Class	Year	Type of vessel	Owner	Class
2018	Container ship	Brodosplit	DNV GL	2019	Cruise ship	Carnival Corporation	RINA
2018	Container ship	Brodosplit	DNV GL	2019	Cruise ship	Carnival Corporation	RINA
2018	Car/passenger ferry	Royal Doeksen	LR	2019	Oil/chemical tanker	Ålvtank	BV
2018	Car/passenger ferry	Royal Doeksen	LR	2019	Oil/chemical tanker	Thun Tankers	BV
2018	Car/passenger ferry	CHFS	LR	2019	RoPax	Baleària	BV
2018	Car/passenger ferry	CHFS	LR	2019	Car carrier	Siem Car Carriers	
2018*	Ro-Ro	TOTE Shipholdings	ABS	2019	Car carrier	Siem Car Carriers	
2018	RoPax	Rederi AB Gotland	DNV GL	2019	Emergency response ship	German Transport Ministry	
2018	General cargo ship	Nordnorsk Shipping	DNV GL	2019	Emergency response ship	German Transport Ministry	
2018	Container ship	Containerships	ABS	2019	RoPax	Brittany Ferries	
2018	Container ship	Containerships	ABS	2019	Oil/chemical tanker	Rosneft	
2018	Container ship	GNS Shipping	ABS	2020	Oil/chemical tanker	Rosneft	
2018	Container ship	GNS Shipping	ABS	2020	Oil/chemical tanker	Rosneft	
2018	Container ship	GNS Shipping	ABS	2020	Oil/chemical tanker	Rosneft	
2018	Container ship	GNS Shipping	ABS	2020	Oil/chemical tanker	Rosneft	
2018	Container ship	GNS Shipping	ABS	2020	Research ship	German Transport Ministry	
2018	Heavy lift vessel	Heerema Offshore	LR	2020	RoPax	Viking Line	
2018	Oil/chemical tanker	Furetank Rederi	BV	2020	Cruise ship	Carnival Corporation	RINA
2018	Oil/chemical tanker	Furetank Rederi	BV	2020	Cruise ship	Carnival Corporation	
2018	Dredger	DEME	BV	2021	Cruise ship	Carnival Corporation	
2018	Bulk ship	POSCO	KR	2021	Cruise ship	Carnival Corporation	
2018	Dredger	van der Kamp	DNV GL	2022	Cruise ship	Carnival Corporation	RINA
				2022	Cruise ship	MSC Cruises	
				2022	Cruise ship	RCCL	
				2024	Cruise ship	MSC Cruises	
				2024	Cruise ship	RCCL	

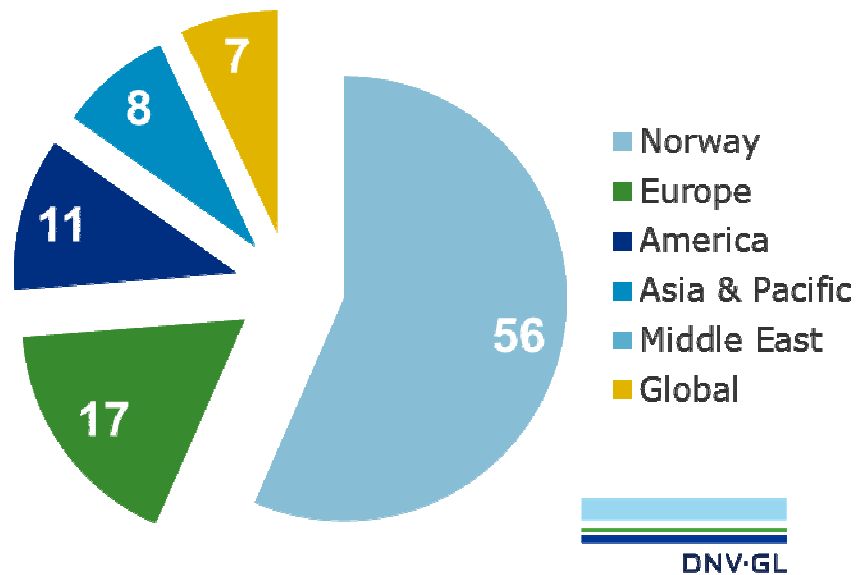
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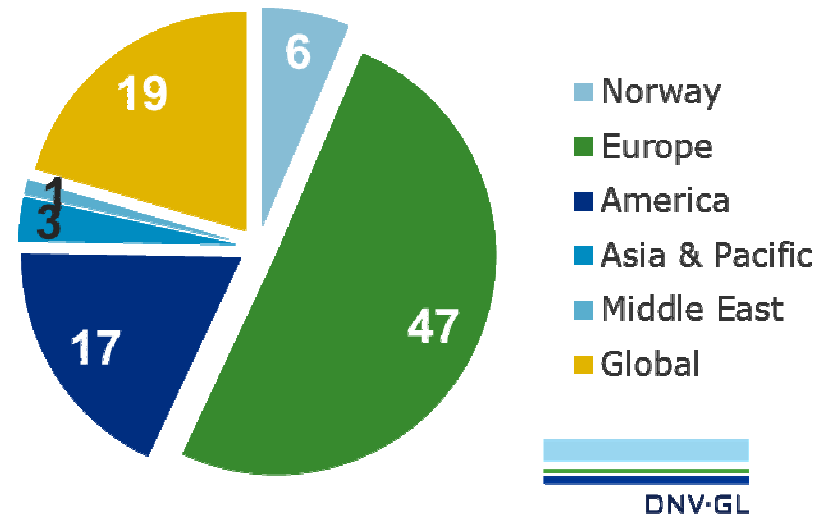
Excluding LNG carriers and inland waterway vessels

Area of operation of LNG fuelled vessels

Operating area of the 99 ships in operation



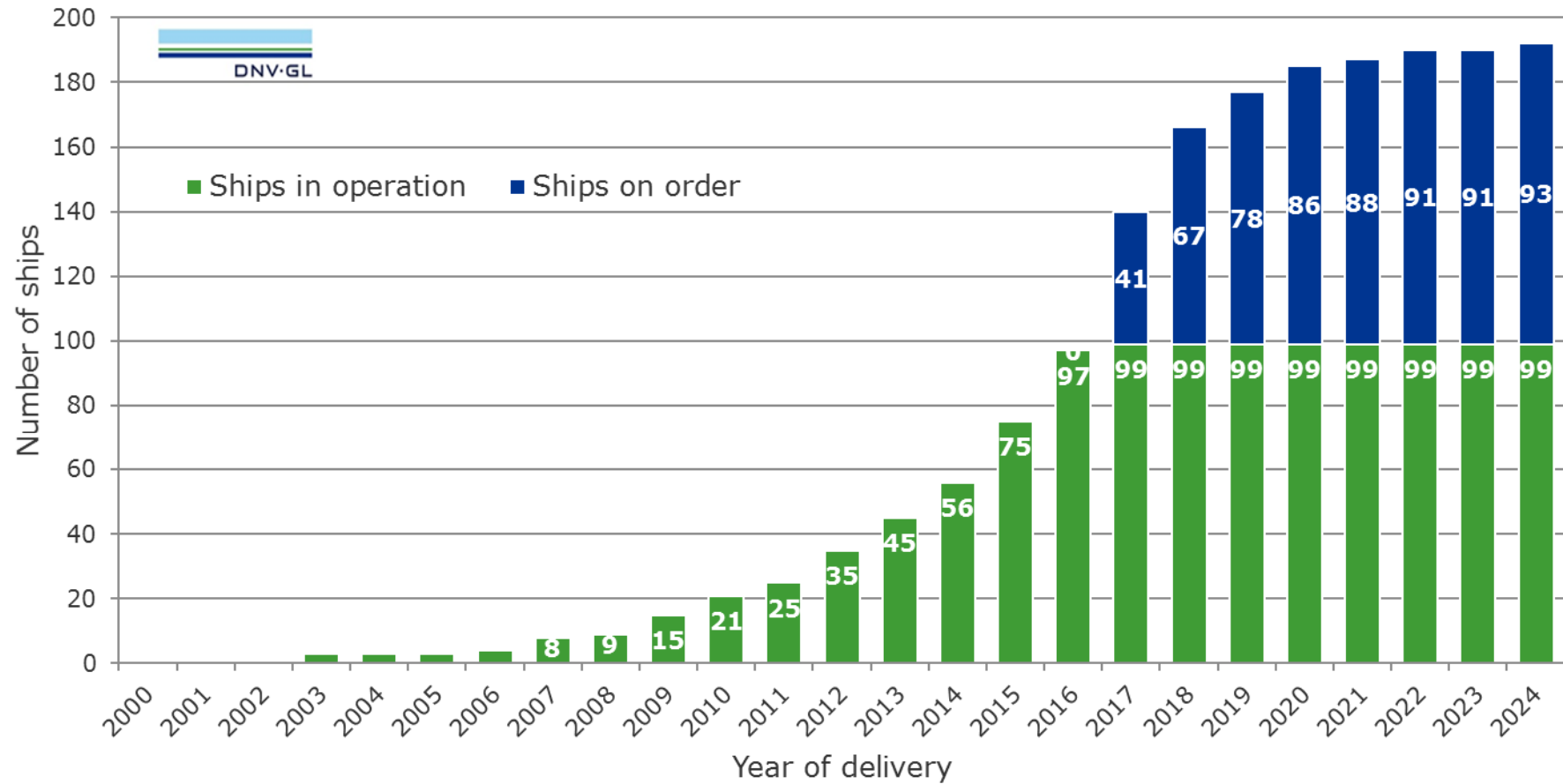
Operating area of the 93 ships in the confirmed orderbook



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Excluding LNG carriers and inland waterway vessels

There are currently 192 confirmed LNG ship fuel projects



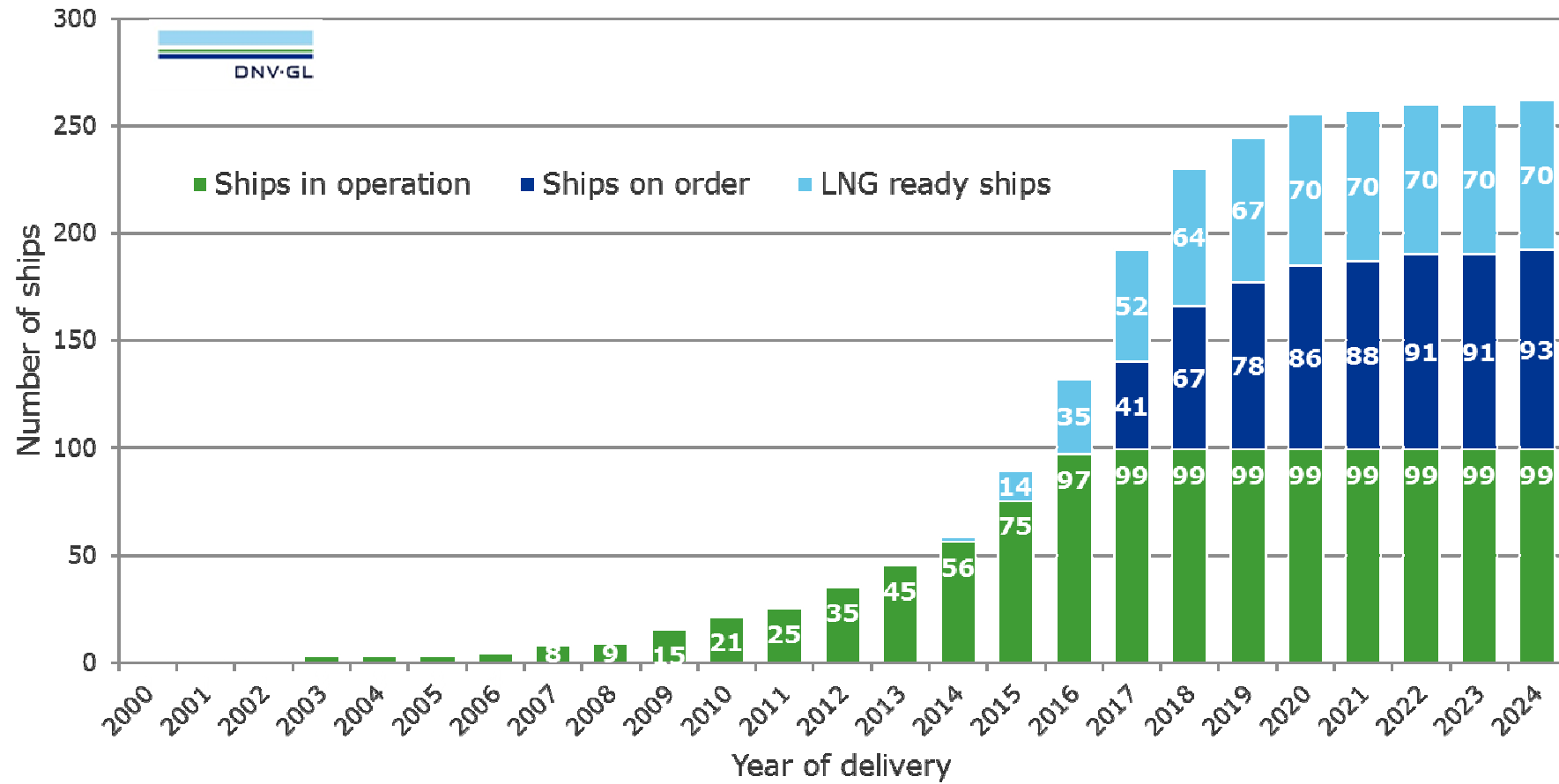
Additional orders beyond 2018 are confirmed

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Excluding LNG carriers and inland waterway vessels

There are currently 192 confirmed LNG ship fuel projects



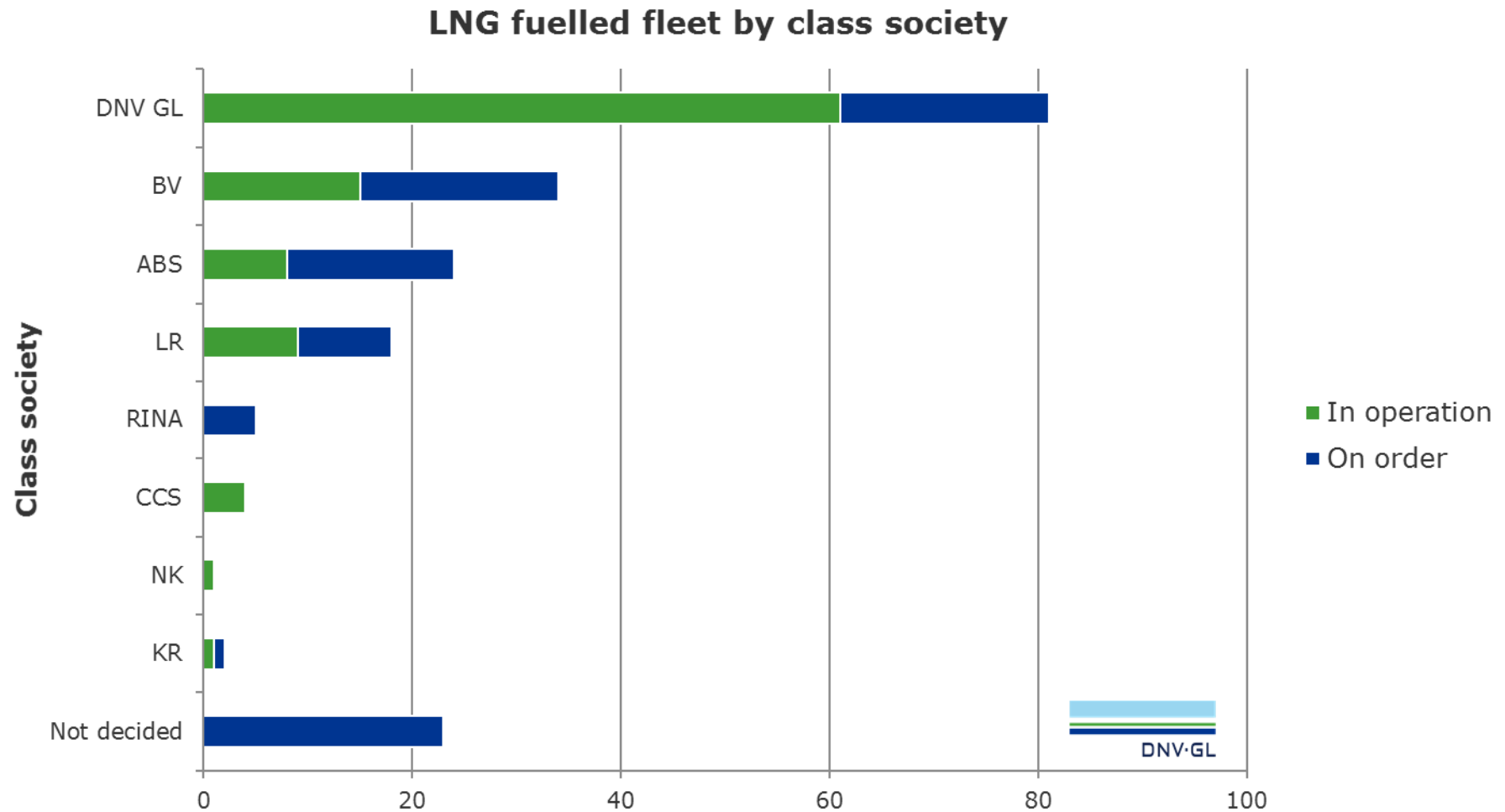
Additional orders beyond 2018 are confirmed

Ungraded

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Excluding LNG carriers and inland waterway vessels

DNV GL – trusted partner for LNG fuel projects

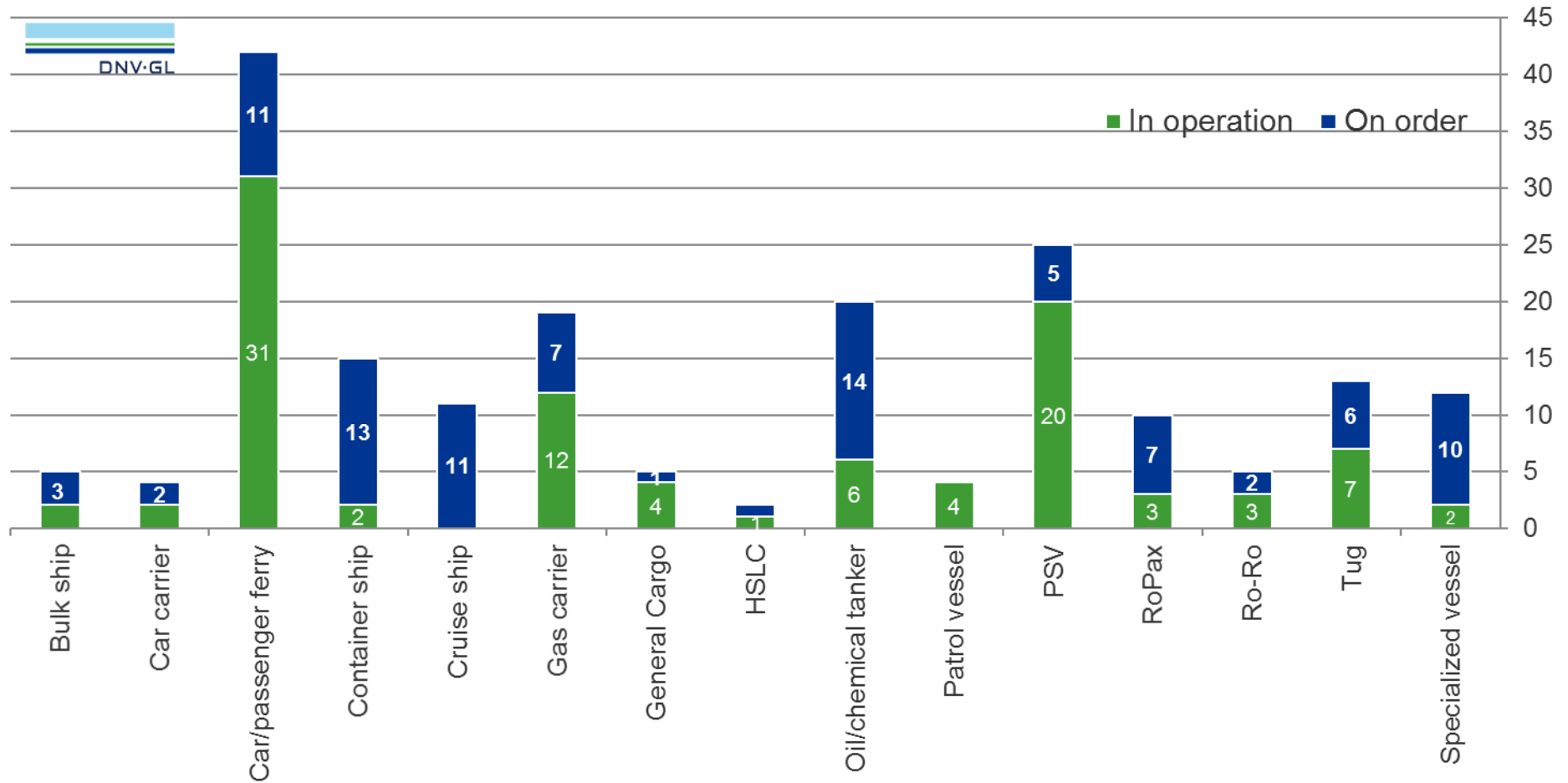


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Excluding LNG carriers and inland waterway vessels

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LNG uptake by vessel segment

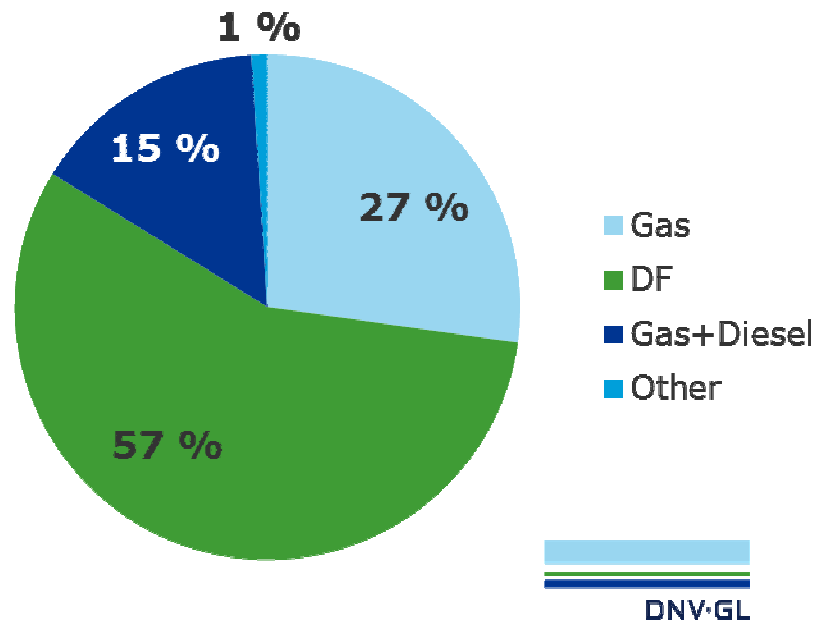


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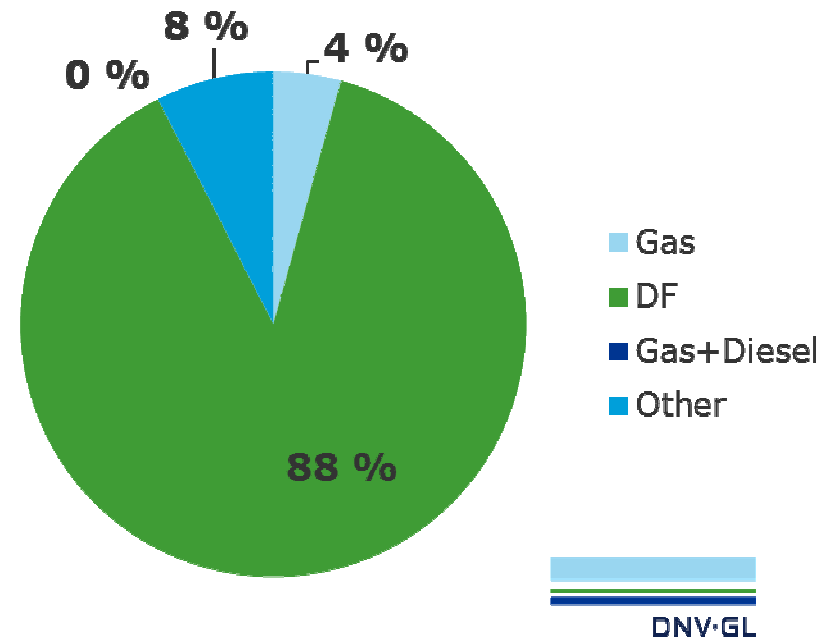
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 Excluding LNG carriers and inland waterway vessels

All engine concepts are in use for ship propulsion

**Gas engine technology
- ships in operation**



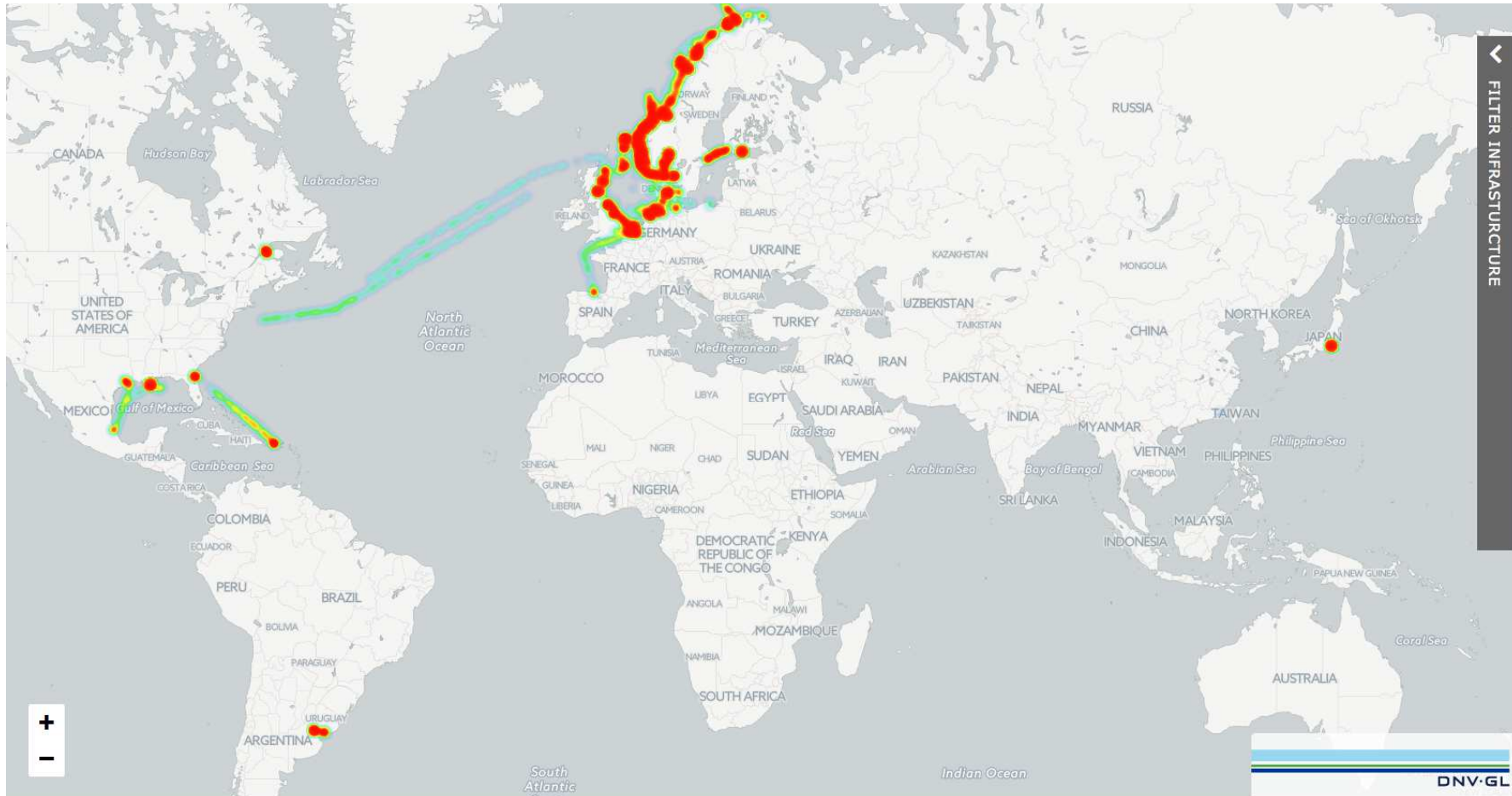
**Gas engine technology
- confirmed orderbook**



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Excluding LNG carriers and inland waterway vessels

AIS data from LNGi shows that LNG fuelled ships are already covering a large area



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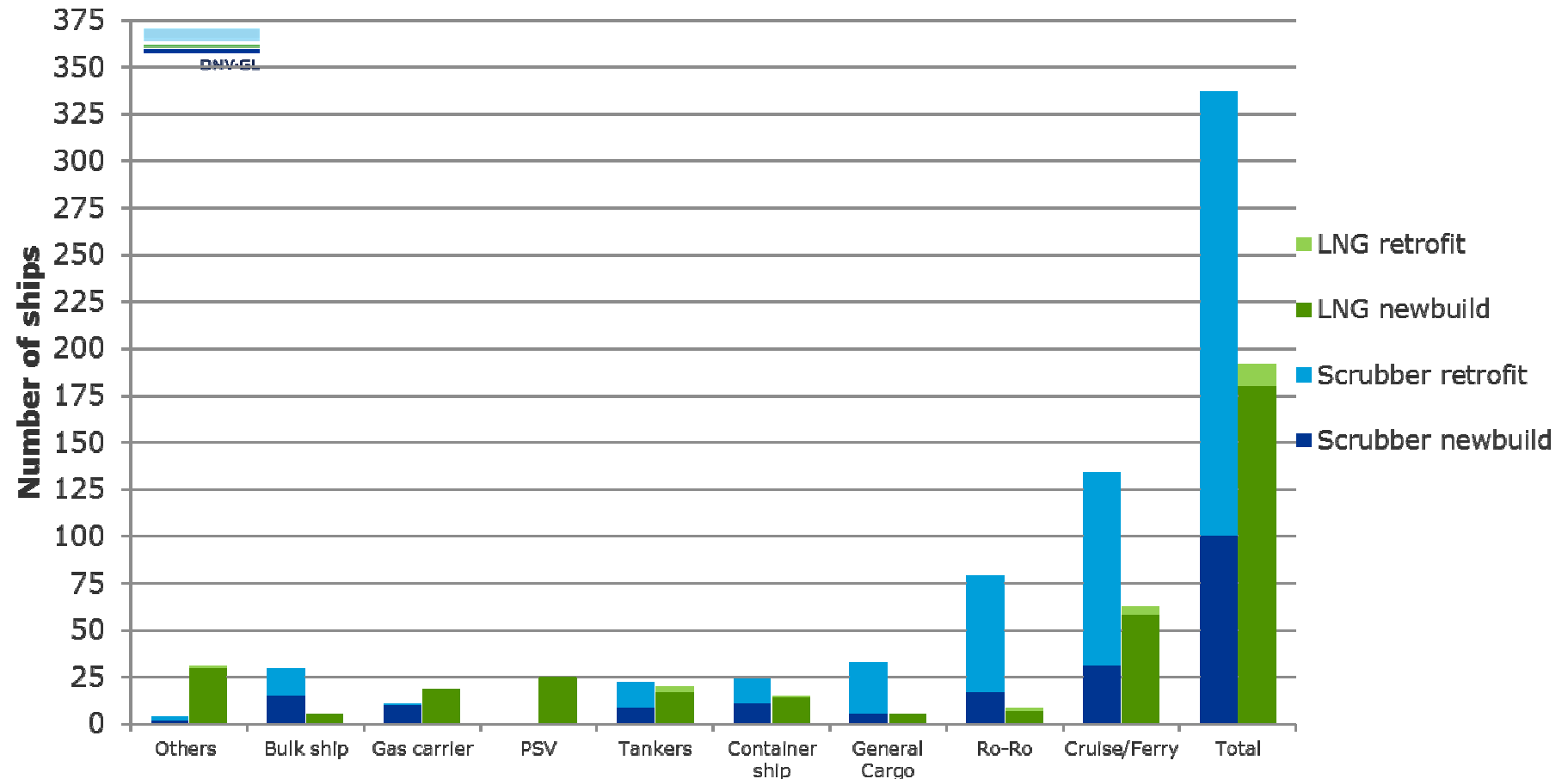
The heat map is based on the LNG fuelled fleet's AIS positions from 27.12.2016-07.12.2016

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Uptake of scrubbers

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Investments in scrubbers are higher in total numbers but LNG fuel is the most frequent choice for newbuilds



**Number of ships are shown. Number of scrubber units are higher.*

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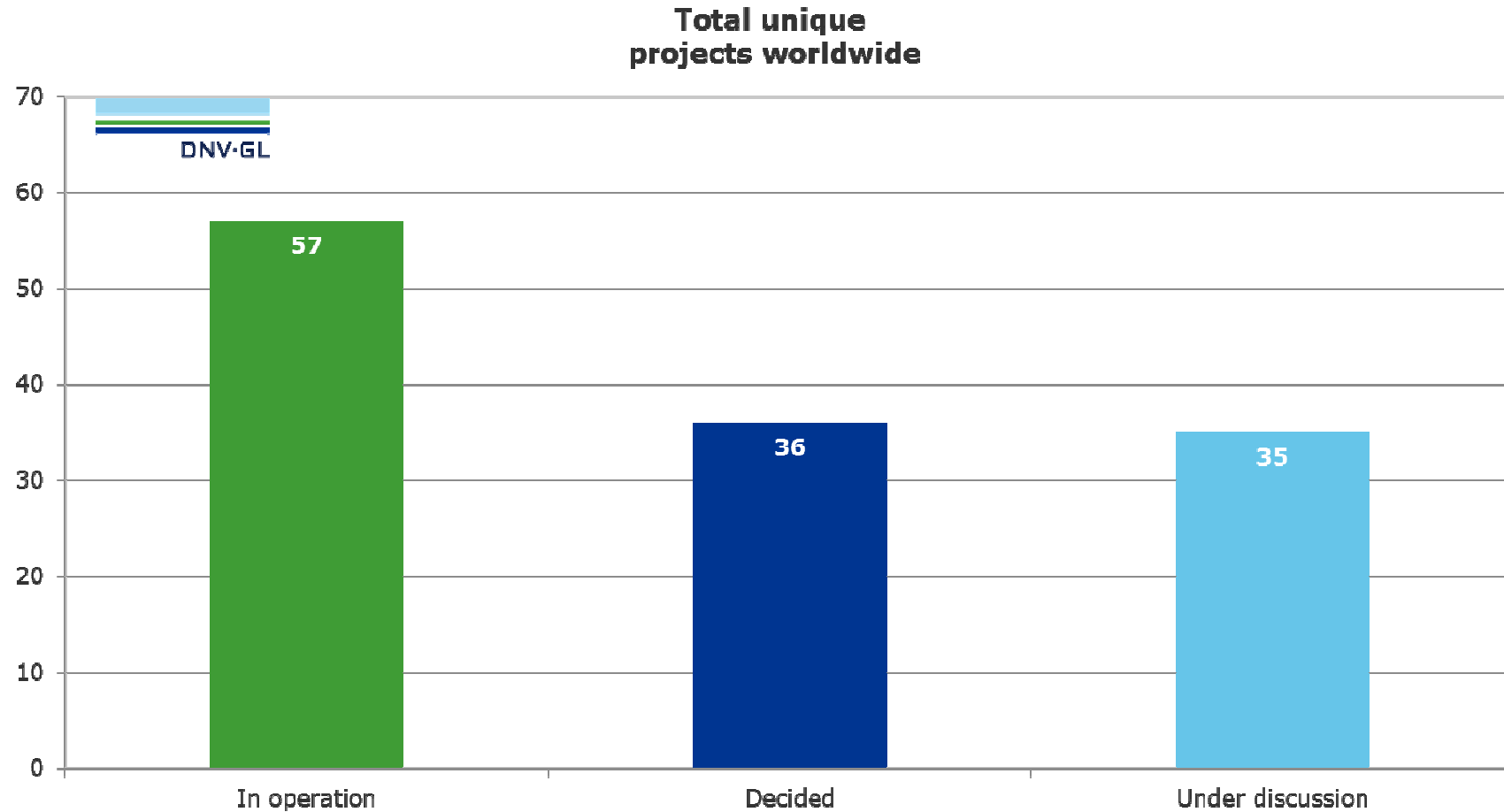
Excluding LNG carriers and inland waterway vessels

SUPPLY

LNG bunkering infrastructure

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57 LNG supply locations for ships worldwide today, and many more decided and planned*



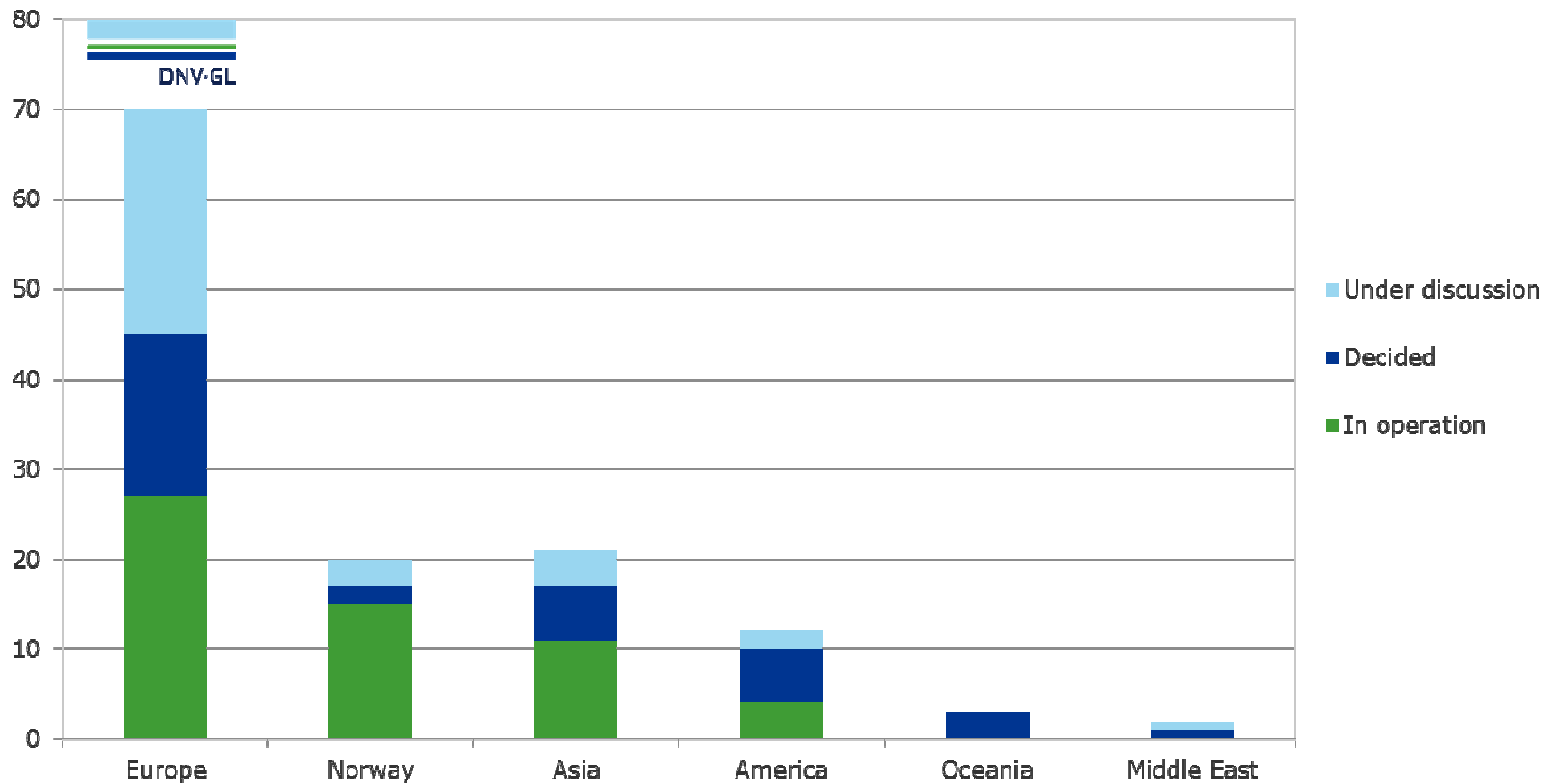
*There may be several bunkering facilities/modes for one location. The count includes local storages, bunker ship loading facilities and truck loading facilities. Locations where LNG fuelled ships can be bunkered by truck or by ship is not counted.

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The majority of LNG supply locations for ships are in Europe*

Status of projects per region

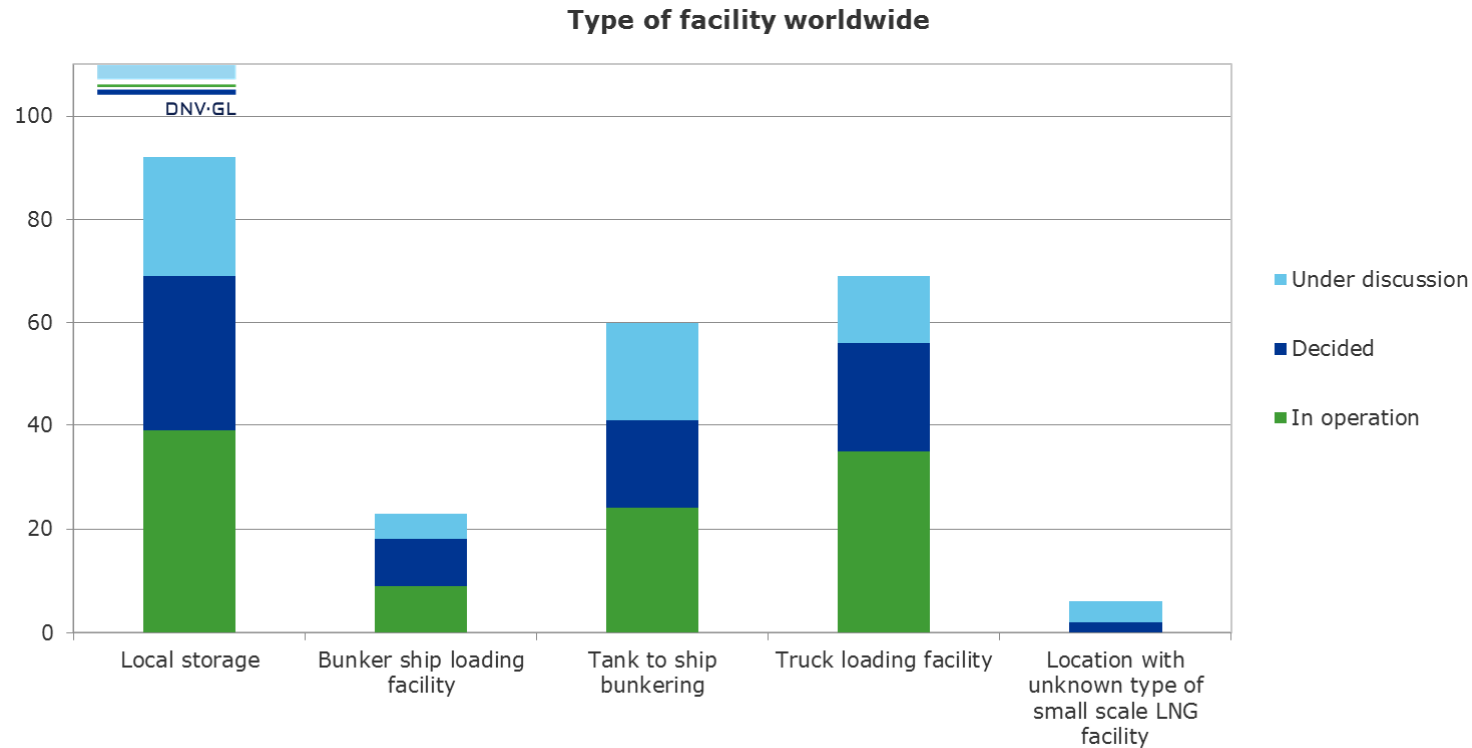


*There may be several bunkering facilities/modes for one location. The count includes local storages, bunker ship loading facilities and truck loading facilities. Locations where LNG fuelled ships can be bunkered by truck or by ship is not counted.

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All types of LNG supply facilities are being developed*



*Some locations have several types of facilities, which is why the number of facilities is higher than the number of locations.

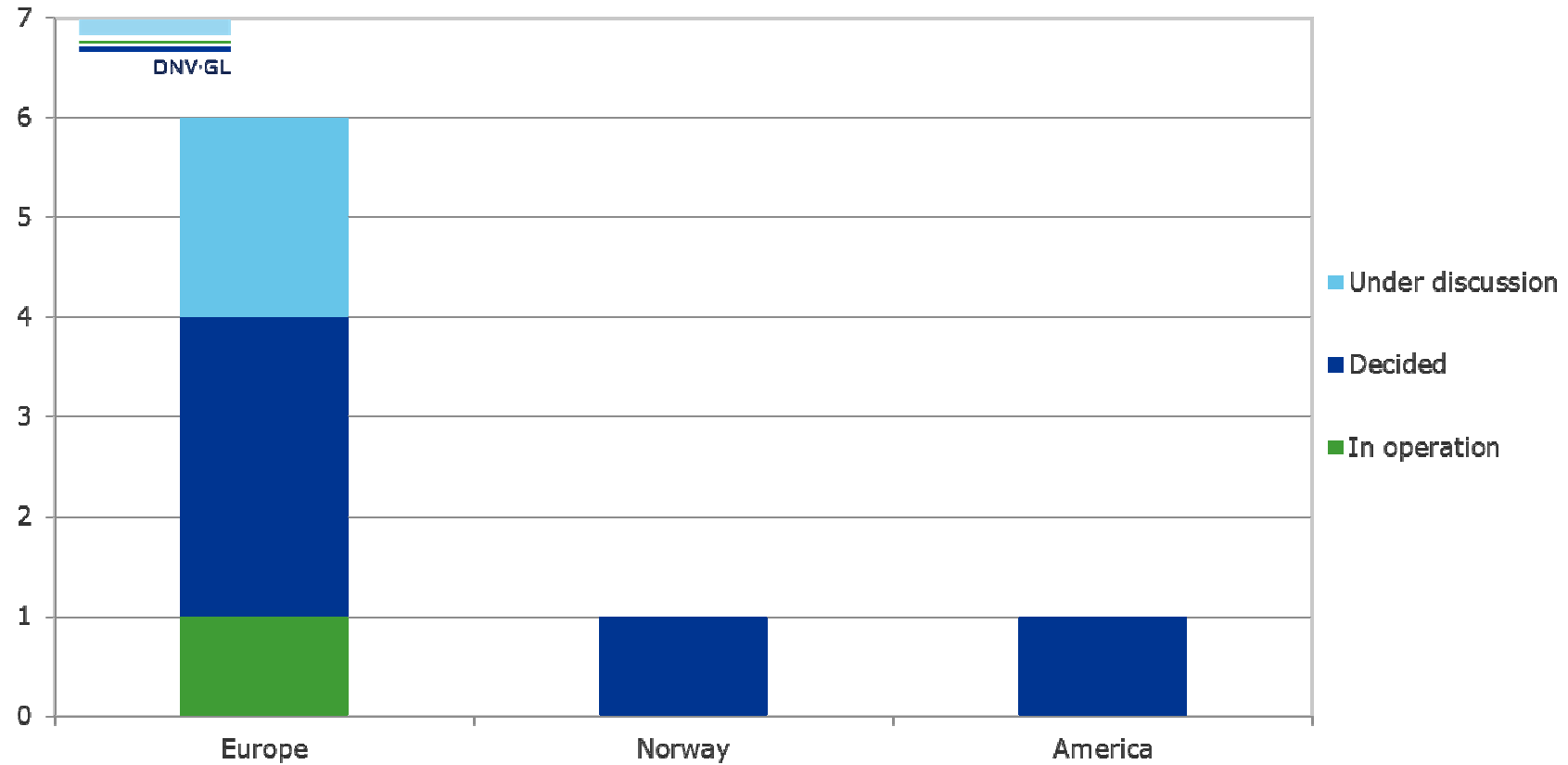
- Local storage – An intermediary LNG storage
- Tank to ship bunkering – A local storage where an LNG fuelled ship can bunker directly from shore
- Truck loading facility – A terminal where LNG trucks can load LNG
- Bunker Ship loading facility – LNG terminal accessible by small LNG carriers

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Within end of 2017 there will be 6 LNG bunker vessels in operation*

Bunker vessels by region (only seagoing)



*In the LNGi map bunkering barges for inland waterway vessels are also shown, but these projects are not counted here.

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LNGi shows a clutter of LNG bunker vessels coming in Europe



*In the LNGi map bunkering barges for inland waterway vessels are also shown, but these projects are not shown here.

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LNG as a fuel

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For more information please

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