



EU Sulphur Directive – a year after the entry into force How ship-owners are meeting new regulation



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Fleet operating exclusively or mostly within SECA

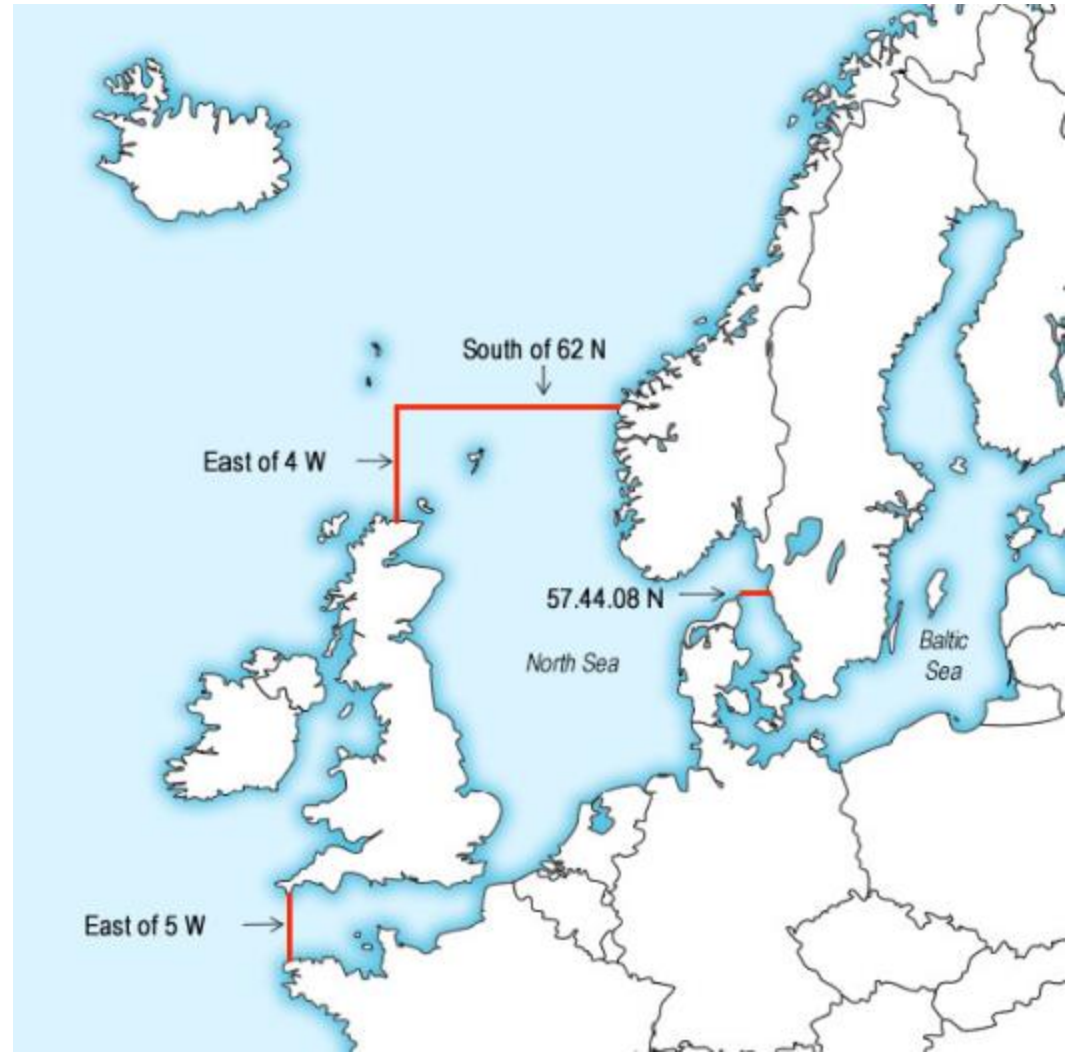
	No of ships
ferries	240
ro-ro	147
container ships	237
bulk carriers	600*
tankers	300*

- estimations

Range of operation:

Ferries, ro-ro, container ships – exclusively in SECA

Bulk carrier and tankers- exclusively or mostly in SECA





How ship-owners are meeting new requirements? Review from the market (end of 2015)

Solutions to meet new requirements:

- Use MGO with sulphur content not higher than 0.1% per mass instead of IFO – currently most popular option
- Install scrubbers on board the ship
- Use alternative fuels, of which the most popular is LNG

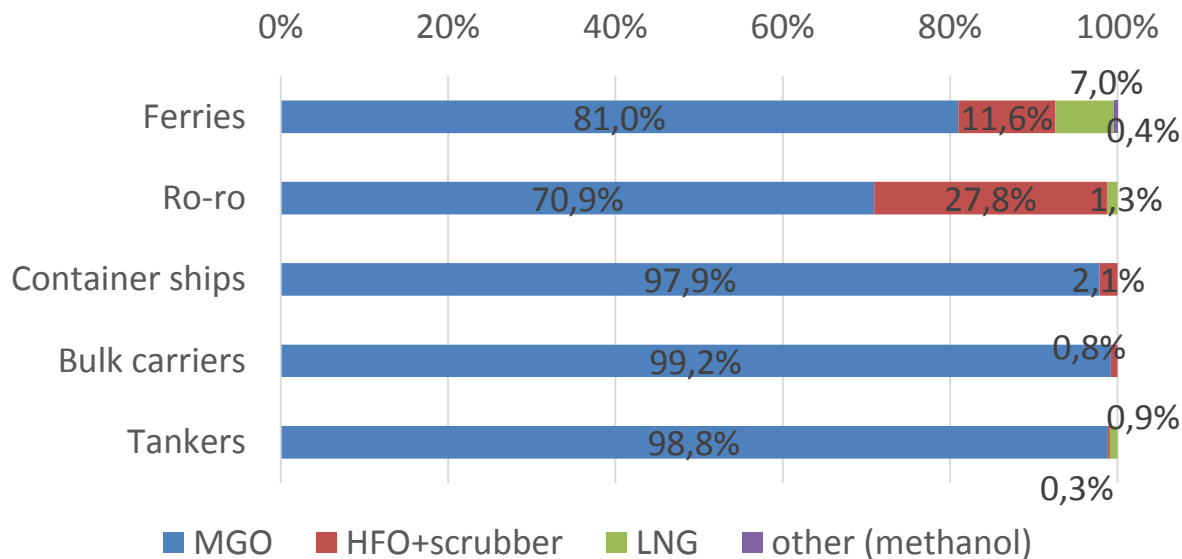


Figure 1. Technology applied in order to meet sulphur regulations by ships operating in short sea shipping in European SECA.



MGO

MGO most popular option:

- Using marine distillate in the main engines does not pose a major technical challenge.
- Low prices of bunker fuels during the last year and a half cause limited interest in alternative solutions



Fuel prices -IFO

● IFO380 in Rotterdam
 vs. Rotterdam Trend
 Date Range: 12m 9m 6m 3m 1m 2w 1w



March 27 - March 27 High: \$605.50 Low: \$241.50 Spread: \$364.00 Change: \$-274.50

March 2014-March 2015

March 2015-March 2016

● IFO380 in Rotterdam
 vs. Rotterdam Trend
 Date Range: 12m 9m 6m 3m 1m 2w 1w



March 2 - March 2 High: \$362.00 Low: \$109.00 Spread: \$253.00 Change: \$-171.50



Fuel prices –MGO (0,1% of sulphur)

● **LSMGO in Rotterdam**
 vs. Rotterdam Trend
 Date Range: 12m 9m 6m 3m 1m 2w 1w



March 26 - March 26 High: \$914.50 Low: \$462.50 Spread: \$452.00 Change: \$-339.00

March 2014-March 2015

March 2015-March 2016

● **LSMGO in Rotterdam**
 vs. Rotterdam Trend
 Date Range: 12m 9m 6m 3m 1m 2w 1w



March 2 - March 2 High: \$613.00 Low: \$253.00 Spread: \$360.00 Change: \$-269.00



Ships with scrubbers

- **73** vessels with scrubbers within European SECA area at the end of 2015
- **10** more are scheduled to be retrofitted at the beginning of 2016
- **5.4%** of total short sea shipping fleet within SECA

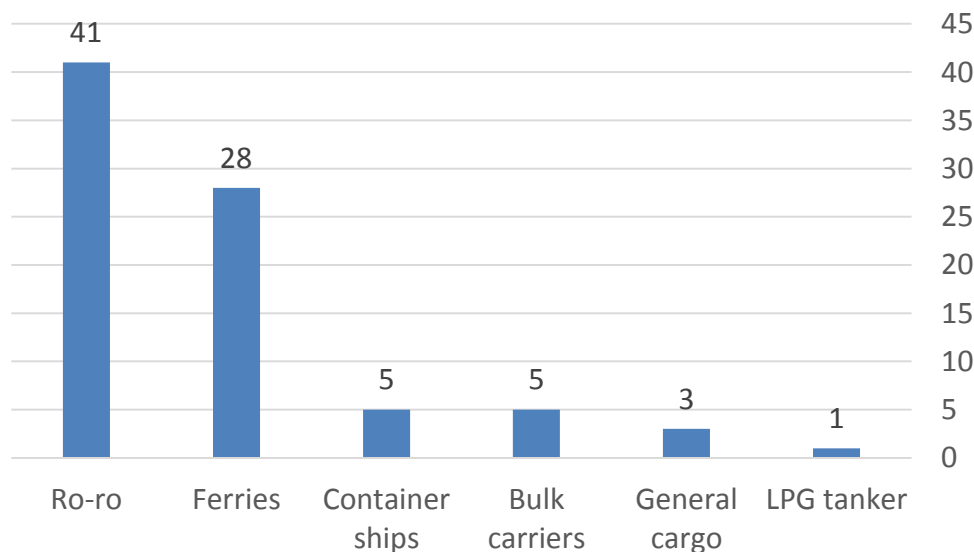


Figure 2. Number of ships operating in North Sea, Baltic Sea and English Channel that have installed scrubbers or are scheduled to install at the beginning of 2016.

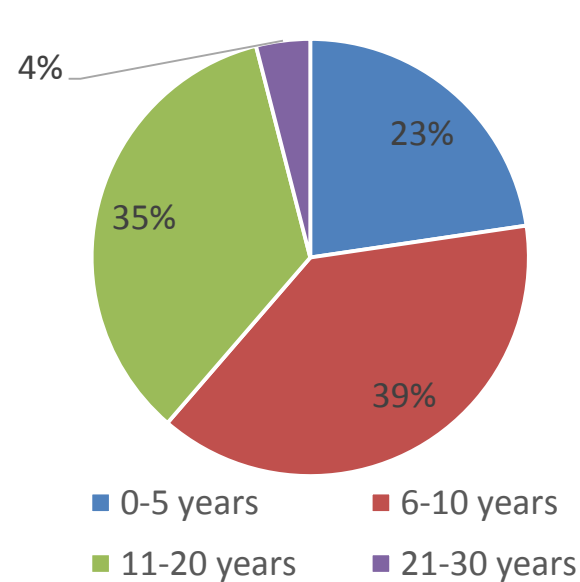


Figure 3. Ranges of age of vessels in year when retrofitting took place.



Ships with scrubbers

Baltic and North Sea ro-pax and ro-ro ship operators that invest in scrubbers
(end of 2015)

Ship-owner	already installed and due to install at the beginning of 2016	Installed and planned (% of total ship-owner's ro-ro and ferry fleet operating within SECA)
DFDS	21	60,0%
Finnlines	15	68,2%
Brittany Ferries	6	85,7%
Transfennica	6	60,0%
Color Line	4	66,7%
KESS	4	40,0%
Scandlines	4	33,3%
Condor Ferries	2	50,0%
Wagenborg Shipping Sweden	2	100,0%
Stena Line	2	8,0%
Bore/P&O Ferries	1	7,1%
SOL Continent Line	1	14,3%
TT-Line	1	16,7%
Total	69	43,1%



Ships powered by LNG

- **27** of LNG fuelled vessels (cargo or passenger ships) within European SECA area at the end of 2015 (24 newbuilds, 3 conversion projects)
- **1.8%** of total short sea shipping fleet within European SECA

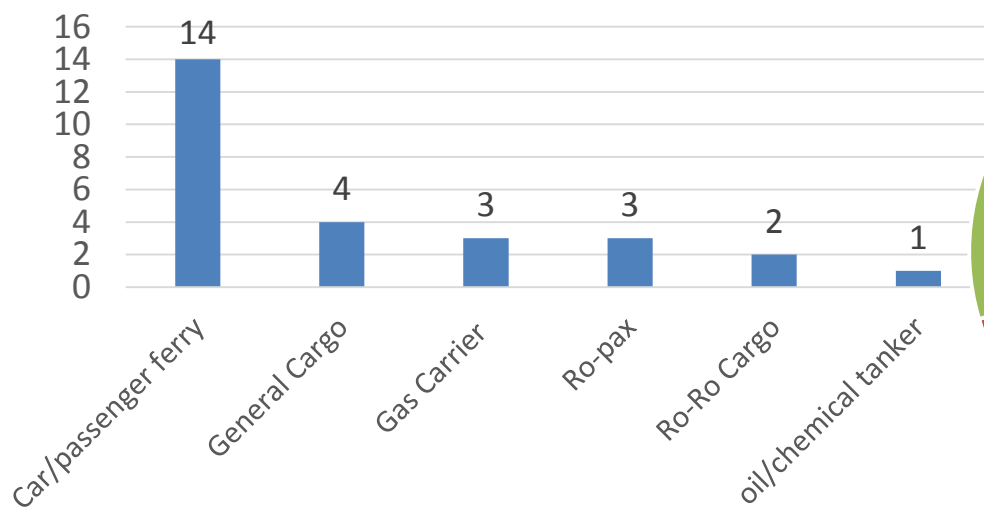


Figure 4. Number of cargo and passenger ships powered by LNG operating in North Sea, Baltic Sea and English Channel (domestic and international traffic).

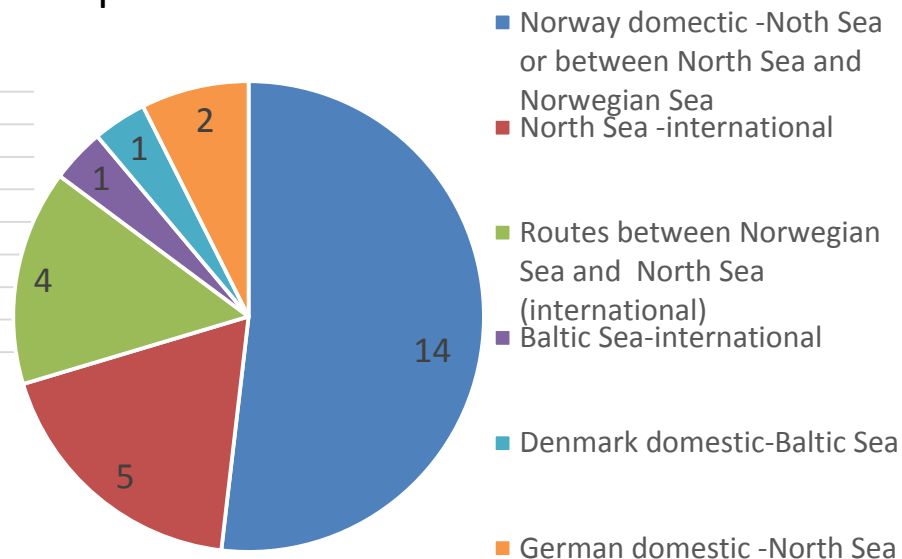


Figure 5. Number of ships operating in each sub region of SECA area (including routes between North Sea and Norwegian Sea).



Cargo and passenger ships powered by LNG in SECA

No.	Year of built	OPERATOR	TYPE	VESSELS	No.	Year of built	OPERATOR	TYPE	VESSELS
1	1985/2015*	AG Ems	Car/passenger ferry	Ostfriesland	15	2007	Fjord1	Car/passenger ferry	Stavangerfjord
2	2015	AG Ems	Car/passenger ferry	Helgoland	16	2006	Fjord1	Car/passenger ferry	Bergensfjord
3	2014	Anthony Veder	Gas Carrier	Coral Star	17	2010	Fosen Namsos Sjø	Car/passenger ferry	Selbjørnsfjord
4	2014	Anthony Veder	Gas Carrier	Coral Sticho	18	2012	Nordnorsk Shipping	General Cargo	Høydal
5	2007/2015*	Bergen Tankers	Oil/chemical tanker	Bergen Viking	19	2013	Norled	Car/passenger ferry	Ryfylke
6	2015	Chemgas	Gas Carrier	Sefarina	20	2013	Norled	Car/passenger ferry	Hardanger
7	2014	Egil Ulvan Rederi	General Cargo	With Marine	21	2009	Norled	Car/passenger ferry	Tideprinsen
8	2014	Egil Ulvan Rederi	General Cargo	With Harvest	22	2009	Norled	Car/passenger ferry	Tidekongen
9	2013	Eidsvaag	General Cargo	Eidsvaag Pioner	23	2009	Norled	Car/passenger ferry	Tidedronningen
10	2013	Fjord Line	Ro-pax	Stavangerfjord	24	2015	Norlines	Ro-Ro Cargo	Kvitnos
11	2014	Fjord Line	Ro-pax	Bergensfjord	25	2014	Norlines	Ro-Ro Cargo	Kvitbjørn
12	2007	Fjord1	Car/passenger ferry	Raunefjord	26	2009	Samsø Municipality	Car/passenger ferry	Samsø
13	1991/2011*	Fjord1	Car/passenger ferry	Tresfjord	27	2013	Viking Line	Ro-pax	Viking Grace
14	2011	Fjord1	Car/passenger ferry	Boknafjord					



Orderbook dedicated for SECA region

Table 4. Total orderbook for ships dedicated for European SECA region (delivery date up to 2018)

Type of ships	Total orderbook	thereof powered by LNG	thereof with scrubbers
Ro-pax	5	3	2
Ro-ro	2	2	0
Container vessels	20	10	3
Bulk carriers	2	1	0
Tankers	11	5	2
Total	40	21	7



Thank you

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