



IMO 2020:

A CLEAR VISION INTO 2020
WITH OUR SUITE OF FUEL SOLUTIONS

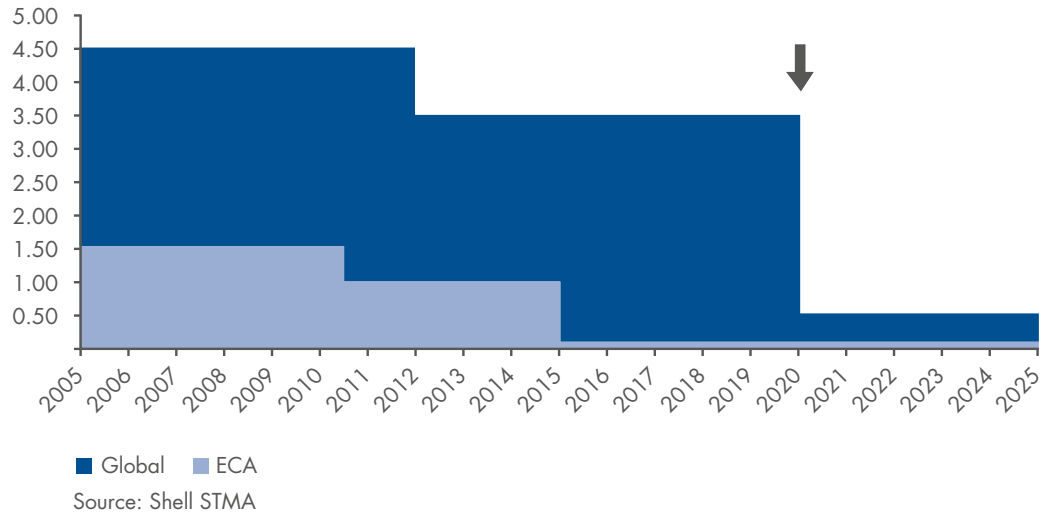


Shell can offer a wide range of marine fuels, lubricants and services to be your partner in providing low sulphur marine transport.

IMO 2020: WHAT IS CHANGING?

In 2016, the IMO announced that the effective date for the reduction of marine fuel sulphur will be 2020. Under the new global cap, ships will have to use marine fuels with a sulphur content of no more than 0.5%S against the current limit of 3.5%S in an effort to reduce the amount of sulphur oxide. The Emission Control Areas (ECAs) will remain at the 2015 standard of 0.1%S content.

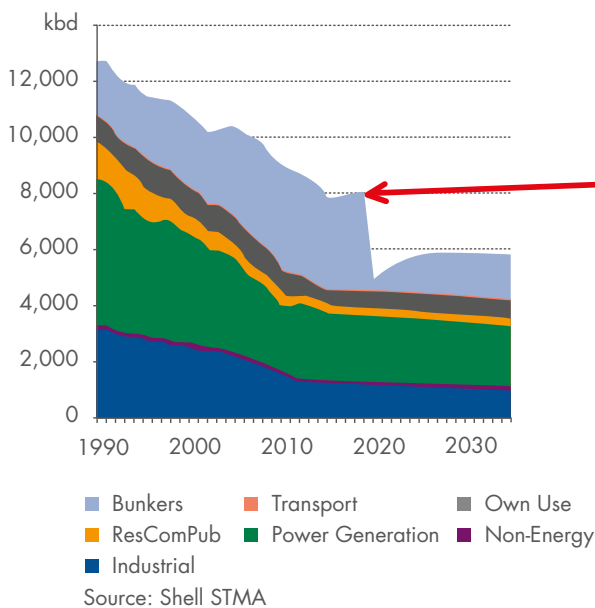
Sulphur limit pc



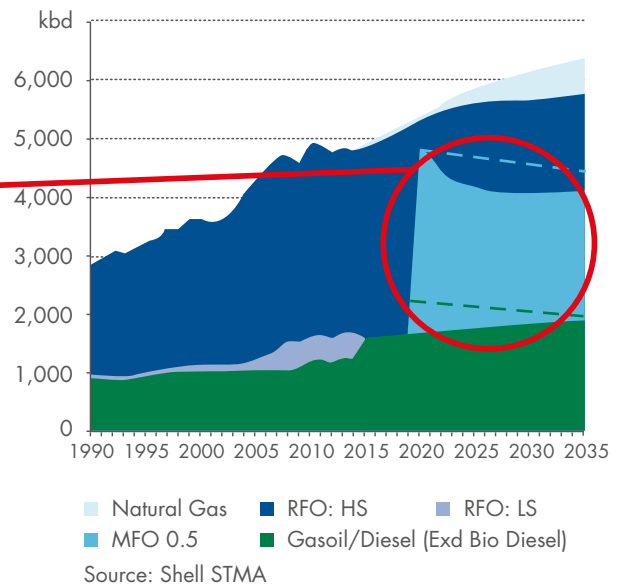
WHY IT MATTERS?

- The transition to 0.5%S will cause more changes to global marine industry than the switch to the 0.1%S fuel in the ECAs. The impact of this transition represents approximately 75% of the global marine fuel demand when compared to the demand of ECA.

Global Residual Fueloil Demand by sector



Bunker Demand

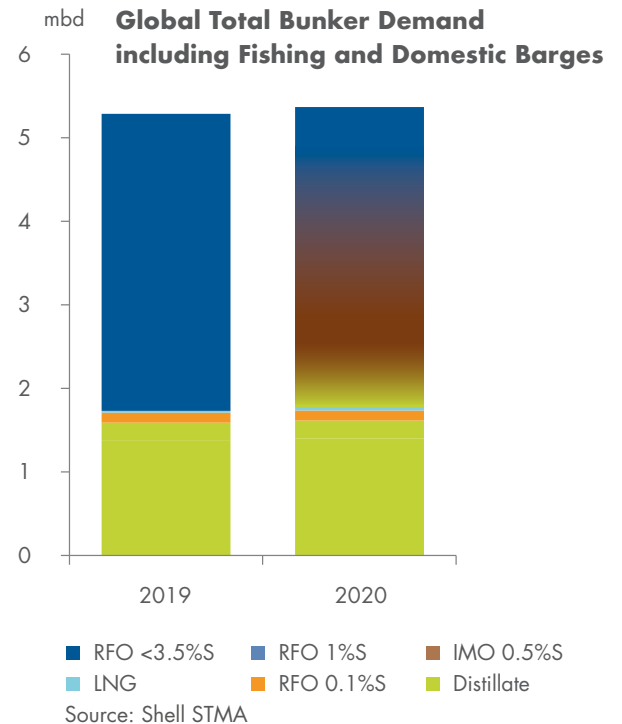


WHAT IS SHELL DOING?





- Shell has developed a suite of fuel solutions for the shipping industry that include marine gasoil (MGO), very low sulphur fuel oil (VLSFO), high sulphur fuel oil (HSFO) for ships with on-board scrubbers and liquefied natural gas (LNG).
- Building upon our experience with the 0.1%S launch, Shell is preparing for the implementation of the 0.5%S blends by performing fuel & engine tests as well as partnering with leading industry players.
- Shell is developing key supply locations to serve LNG fuel customers. LNG fuel is readily available, clean and cost competitive. It is the next step in the journey towards zero emissions.
- Shell keeps improving its lubricants, which are designed specifically to protect engines burning marine fuels from wear and deposits.

Shell built on its experience from the creation of its 0.1%S ULSFO to create a new 0.5%S VLSFO

- In total 3 million barrels per day (mbd) of High Sulphur Fuel Oil (HSFO) Bunkers will need to switch to 0.5%S fuel.
- There will be large variability in fuel quality which can impact compatibility and handling of fuel on board vessels.
- Shell can help by sharing expertise and operational experience from the 0.1%S ECA launch to manage this variability.
- Shell has studied over 100 streams and assessed numerous blends in order to develop its 0.5% sulphur, ISO-compliant fuel formulations.
- Shell has partnered with ship owners to perform trials of VLSFO and can provide support during testing to ship owners so that they can better understand compatibility and handling operations.
- LNG fuel can help ship owners and operators meet emissions regulations, as it contains virtually no sulphur, and offers reduced NOx and PM emissions. Shell LNG can also help reduce GHG emissions in shipping.
- Shell LNG can be a cost competitive fuel choice. LNG can be priced off oil markers to reduce risk and ensure a level playing field.



SHIP OWNERS WILL HAVE A NUMBER OF CHOICES OF HOW TO COMPLY WITH THE NEW SULPHUR SPECIFICATIONS

0.1%S / 0.5%S Fuel Oil	0.1%S / 0.5%S MGO / DMA / GTL	Scrubber New/Retrofit	LNG
			
<ul style="list-style-type: none"> ■ Minimise operational difficulty and cost ■ Variability of quality of blends per supplier ■ Only a few suppliers can offer reliable supply 	<ul style="list-style-type: none"> ■ Convenient and widely available ■ Operational experience in industry ■ Higher cost ■ Thermal shock and lubricity issues 	<ul style="list-style-type: none"> ■ Cheaper fuel and quick payback ■ Limited operating experience ■ Ship stability and space ■ Safe sludge handling and disposal necessary 	<ul style="list-style-type: none"> ■ Proven technology and reduction SOx, NOx and PM ■ Lower GHG emissions ■ Growing availability ■ Cost advantage to MGO/DMA
Shell will supply differentiated VLSFO	MGO/DMA will remain key products for Shell	Shell can supply HSFO 3.5%	Shell is an innovation leader in LNG
LUBRICANTS FOR CROSSHEAD DIESEL ENGINES (2 STROKE)			
Shell Alexia S3, 40	Shell Alexia S3	Shell Alexia 50 (70), S6 (100), 140	Shell Alexia S3
LUBRICANTS FOR TRUNK PISTON ENGINES (4 STROKE)			
Shell Argina S2, S3	Shell Gadinia S3	Shell Argina S3, S4, S5	Shell Mysella S3 N, S5 N

COMPLIANCE

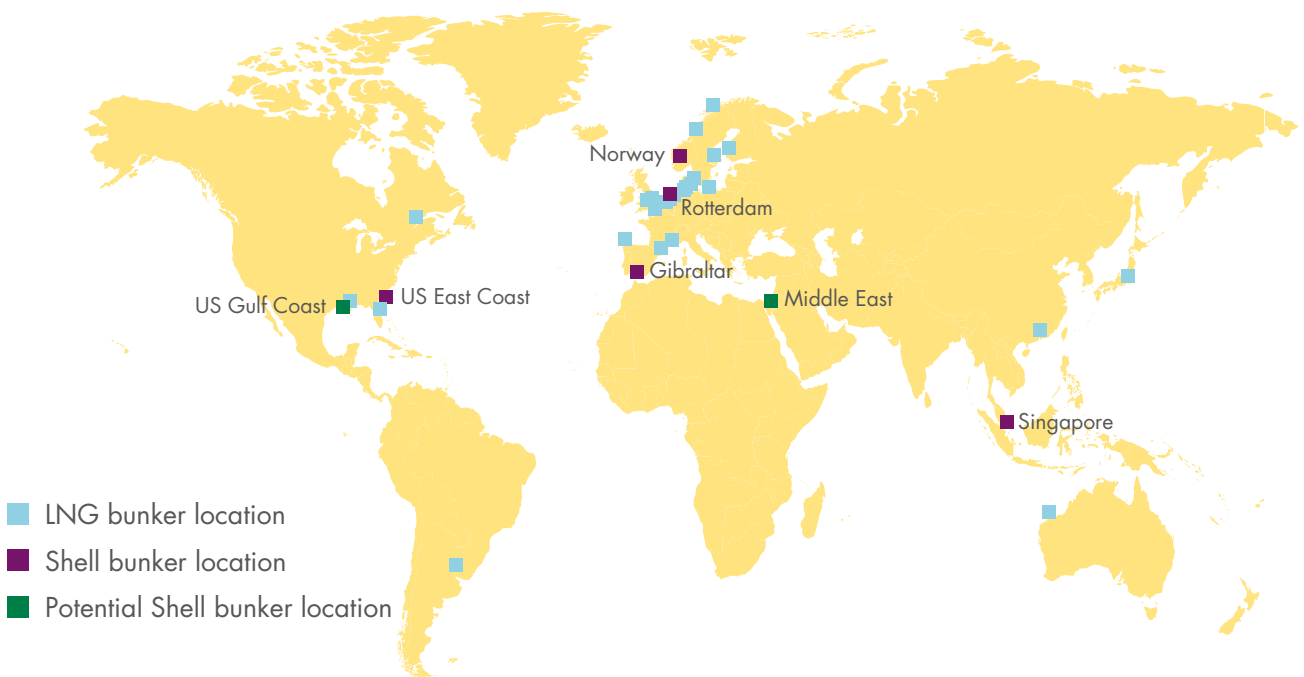
There are still uncertainties on how ship owners and operators are expected to comply with the 2020 regulatory framework and how enforcement will be applied. An important step was taken by the IMO with the introduction of the HSFO carriage ban.

Shell can help you determine the right fuel selection for you and your organisation. We are currently testing our new compliant fuels with our customers, so that they can be ready for 2020.

GLOBAL SHELL MARINE FUELS TRADING NETWORK



GLOBAL LNG MARINE BUNKER NETWORK



Bunker location data provided courtesy of DNV GL as of 3 April 2017 (in operation, bunker ship loading or local storage. Tank to ship bunkering or 'other bunker facilities', not including inland.)

LNG as a marine fuel is expanding globally with bunker locations growing and LNG fuelled ship segments broadening.

SHELL FUEL AVAILABILITY

	HSFO				VLSFO	ULSFO	MGO	
	RME 180	RMG 380	RMK 500	RMK 700	0,5% (2020)	<0.1%	<0.1%	0,5% (2020)
AMERICAS								
Montreal & St Lawrence	■	■				■	■	■
Sarnia	■	■	■				■	■
New York	■	■	■	■		■	■	■
Freeport		■			■		■	■
Nassau		■					■	■
New Orleans		■			■		■	■
Houston		■			■		■	■
Antigua		■					■	■
Vancouver	■	■					■	■
Baltimore		■					■	■
EUROPE								
Rotterdam		■*	■	■	■	■	■*	■
Antwerp			■	■	■	■		■
Barcelona					■		■	■
Piraeus		■	■		■		■	■
Danish Strait					■		■	■
MIDDLE EAST + SOUTH AFRICA								
Fujairah	■*	■*			■*			■*
Durban	■				■			■
Richards Bay	■				■			■
Mauritius	■	■			■		■	■
ASIA								
Singapore		■	■		■		■	■
Hong Kong		■	■				■	■
Noumea		■						

Table shows general specification/availability and for specific specification/availability, please approach the corresponding account managers for enquiry

* ex-wharf business only

MOVING FORWARD

Shell will be prepared for 2020. You can count on Shell as your partner to supply marine fuels and lubricants. As a worldwide and reliable supplier of various marine fuels and services, we can offer a complete portfolio and customised solutions.

For questions or more information, please refer to our website

www.shell.com/marine

Information as of September 2018

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