

# IMO 2020



**For greener shipping**

# IMO2020 in short



New IMO2020 regulation will come into force as of **1 January 2020**



## IMO Initiative

The International Maritime Organization (IMO) has introduced new regulations to reduce marine pollution caused by the shipping industry.

## IMO2020

is the first in a series of steps by the IMO to reduce emissions in response to climate change.

## Max. 0.5% sulphur content

All vessels will be required to use fuel with only 0.5% sulphur content (today the cap is 3.5%).



# IMO

## Three promising solutions

for reducing sulphur emissions and becoming compliant.



**Option 1**  
Compliant fuels



**Option 2**  
LNG



**Option 3**  
Exhaust Gas  
Cleaning Systems

## Hapag-Lloyd

embraces the new regulation. We are testing technical solutions and will introduce a new **Marine Fuel Recovery** mechanism (MFR).



## For a more sustainable future

The IMO2020 emission regulation means that ships will significantly reduce emissions on the high seas as well as in coastal areas resulting in much greener shipping.





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# New Low Sulphur Fuel regulation as of 2020

## The shipping industry is changing

- The IMO has introduced a new marine fuel regulation, which limit the sulphur emissions caused by marine fuels to **0.5 percent sulphur** as of **January 1, 2020**
- This is biggest shake-up of global shipping regulation in years – it is obvious that becoming compliant requires **significant costs**, which will be mainly reflected in the fuel bills
- This new regulation will significantly **improve the ecological footprint** of the shipping industry and majority of all vessels are expected to be operated with low sulphur fuel oil by then
- Other technological options that cover a small share of the shipping industry are switching to **LNG** or installing **Exhaust Gas Cleaning Systems**



As of January 1, 2020 all ships will be required to use fuel with 0.5% sulphur content or less on all of the world's oceans



Stricter 0.1% sulphur regulations will remain in the emission control areas in Europe and North America

0.1% sulphur limit  
0.5% sulphur limit

# Financial impact of IMO2020 for the shipping industry



Complying with the new low sulphur regulation will make the industry significantly greener, but compliance will have a significant cost impact on the industry, Hapag-Lloyd, and our customers

- To comply with the regulation, the industry will have to either start using low sulphur fuels or invest in new technologies that have yet to be thoroughly tested in practice
- In either case the **costs will go up**, because compliant fuels as well as investments to new technologies will be expensive
- Experts are estimating an additional initial fuel cost of **USD 60bn for the entire industry** annually in the first years
- Furthermore, Hapag-Lloyd is estimating its additional initial costs to amount up to **USD 1bn for the company** annually in the first years, based on the assumption that the spread between HSFO and LSFO 0.5% will be USD 250 per tonne
- To recover fuel related costs caused by the IMO2020, Hapag-Lloyd is introducing a transparent and fair **Marine Fuel Recovery (MFR)** mechanism





# Industry has three promising options for ensuring compliance



However, the majority of all vessels in the shipping industry are expected to be operated with low sulphur fuel oil by 2020. This is the key solution for the shipping industry and Hapag-Lloyd to remain compliant. Furthermore, it is the most environmentally friendly solution in the short term.



## Compliant fuels

- Higher fuel price  
Higher operating expense  
Not yet on the market
- + Minor capital expenditure  
Currently the most environmentally friendly solution
- \$ Expected initial cost increase of USD 1 billion for Hapag-Lloyd annually in the first years



## Liquefied natural gas (LNG)

- High capital expenditure  
Infrastructure not sufficient
- + Regulatory certainty  
Lower emissions
- \$ Estimated USD 25-30 million per ship



## Exhaust gas cleaning systems

- Increased fuel consumption  
Increased CO2 emissions & water pollution  
Interim solution  
Lack of experience in the industry
- + Lower capital investment than LNG  
No change in fuel (HSFO 3.5%)
- \$ Estimated USD 7-10 million per ship





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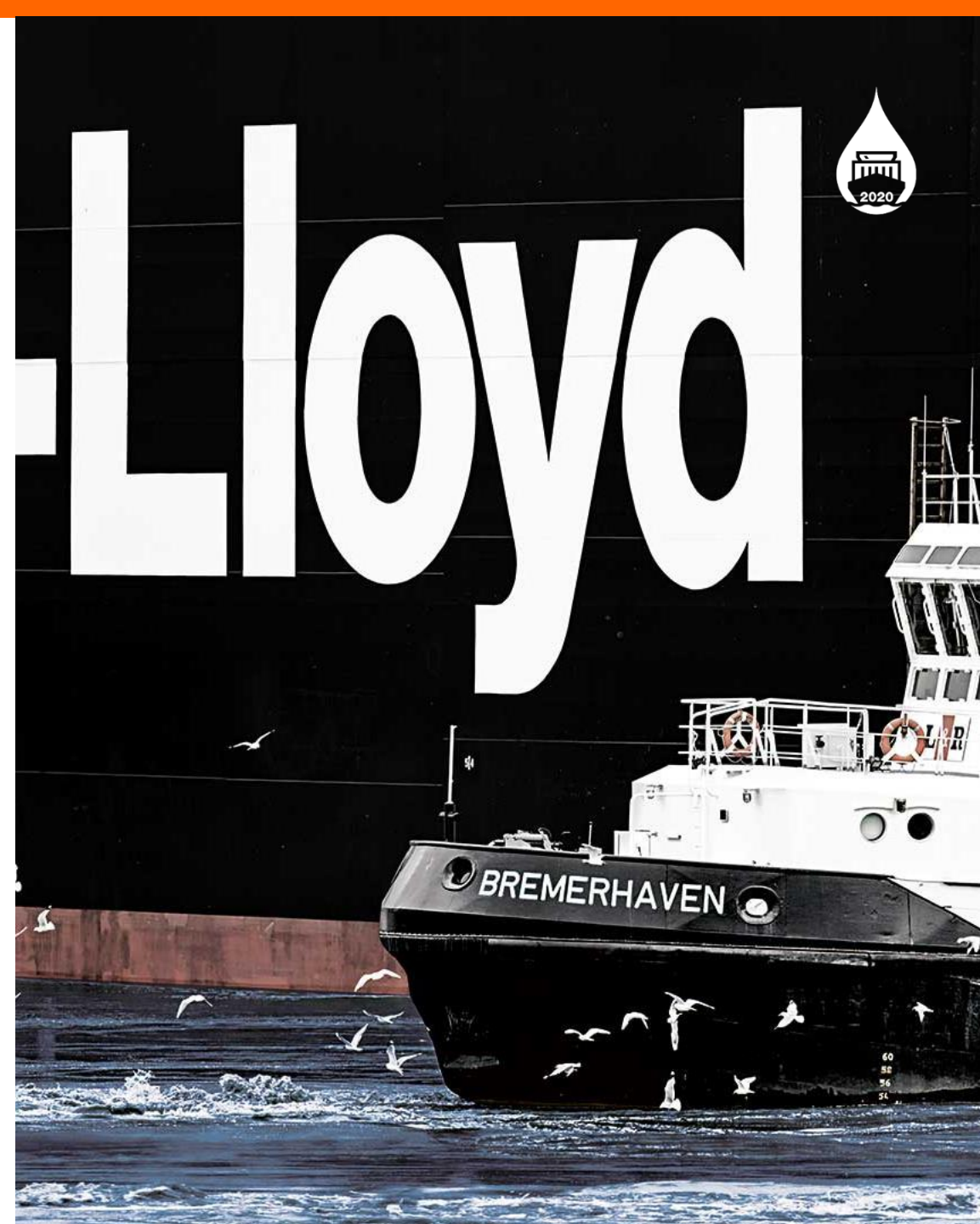




# Hapag-Lloyd welcomes the new regulation

Hapag-Lloyd fully supports the new regulation and is delighted that the industry has taken a turn toward a greener future

- We are expecting that new fuels will be on the market in sufficient amounts by January 2020
- **Low sulphur fuel** is the key solution for Hapag-Lloyd to remain compliant, as the installment of LNG and EGCS is feasible for only a small share of the fleet
- However, our aim is to analyse the performance of technical options, which is why we have planned **pilot projects** for 2019 with both LNG and Exhaust Gas Cleaning Systems



# Hapag-Lloyd has planned trials to determine the best mix of measures for our fleet, customers and the environment



Hapag-Lloyd will test two ships with EGCS systems next year and operate another ship with LNG. If these tests are successful, we will convert more ships if necessary.

- Though we believe that currently low-sulfur fuel is the key solution for Hapag-Lloyd and the entire shipping industry, to comply to the IMO2020 regulation, we want to make sure we have evaluated all options



## Liquefied Natural Gas

Converting one vessel planned for 2019



## Exhaust gas cleaning systems

Installment on two 13,000 TEU vessels planned for 2019

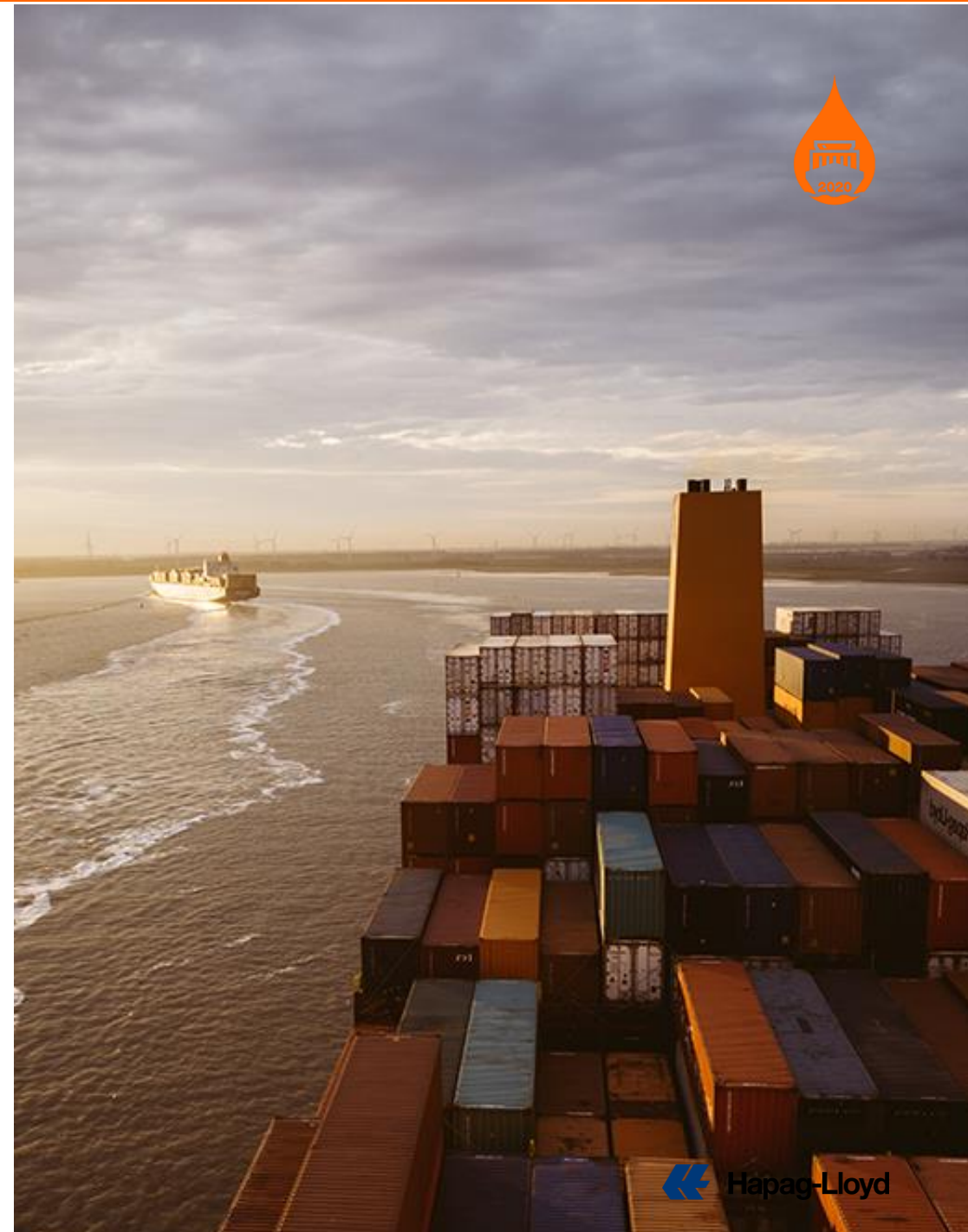


# Hapag-Lloyd is introducing a Marine Fuel Recovery mechanism

Hapag-Lloyd is simplifying its rate structure and will replace all existing fuel charges with a new **Marine Fuel Recovery (MFR) mechanism**

- Marine Fuel Recovery Mechanism will be gradually implemented from **1 February 2019**
- It is **causal**, **transparent** and **easy-to-understand**
- It helps our customers **predict** and **plan** the price increases for their trade routes
- The MFR aiming at **recovering costs** arising from stricter regulation
- The calculation is based on **average market data**

$$\text{MFR}_{[\text{per TEU}]} = \text{Fuel price}_{[\text{per TO}]} \times \frac{\text{Fuel consumption}_{[\text{TO}]}}{\text{Carried TEU}}$$



# Causal, transparent and easy-to-understand: The MFR mechanism is based on a set of variables and average market data



The MFR is based on **market data** and derived out of **averages for Market Class Vessels**

## Fuel consumption (per tonne)

- The consumption level is based on data from Transmodal
- Considered per roundvoyage at average speed
- Differentiation between days spent at sea and at port (eeSea data)

$$\text{MFR}_{[\text{per TEU}]} = \text{Fuel price}_{[\text{per TO}]} \times \frac{\text{Fuel consumption}_{[\text{TO}]}}{\text{Carried TEU}}$$

## Fuel price (per tonne)

- Based on market prices for different fuel types
- Fuel types included: HSFO or LSFO 0.5% and LSFO 0.1%

## Carried TEU

- Estimation of the carried TEUs per roundvoyage consists of the nominal size of a market class vessel (eeSea) and utilization based on Clean Cargo Working Group data (CCWG)
- **Example: East Asia – North Europe trade**
  - 19 different services per week considered
  - For each service its average vessel is determined and considered in the calculation
  - A market class vessel for this trade is ~14,300 TEU based on vessel size data from eeSea
    - 14,000 – 22,000 TEU: 10 services
    - 10,000 – 14,000 TEU: 5 services
    - 8,000 – 10,000 TEU: 2 services
    - 4,000 – 6,000 TEU: 2 services
  - 70% utilisation based on the global average utilisation outlined by CCWG
    - $14,300 \times 0.7 = 10,010$  TEU



# MFR samples for standard dry containers at different fuel prices for selected trades



## Marine Fuel Recovery (MFR) per TEU for different fuel prices per tonne\*

Trade	USD 400	USD 525	USD 650
East Asia – North Europe	213	262	311
East Asia – North America East Coast	254	311	369
North Europe – North America East Coast	153	171	188
East Asia – North America West Coast	130	161	191
East Asia – South America West Coast	261	338	415
North Europe – Indian Subcontinent	128	155	183

\* Market price assumptions for HSFO or LSFO 0.5%. Also includes LSFO 0.1% under the assumption its market price is 660 US dollars

Note 1: The same MFR applies to both directions

Note 2: The sample calculation is only indicative and is based on currently available market data



# For a greener future



IMO2020 will make the shipping industry significantly greener, and Hapag-Lloyd welcomes this development. However, the **IMO2020 sulphur regulation is just the beginning** as the IMO has announced a vision to be emission-free by 2100.

Compliance will have its challenges and will have major cost impacts on the industry, Hapag-Lloyd and our customers. However, we are confident that – with our **high environmental standards** and **experience in proactively reducing emissions** – we are ready to successfully tackle the challenge.





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# Q&A – About IMO2020



## What is IMO2020?

IMO2020 concerns the International Maritime Organization (IMO) regulation on the use of low-sulphur fuel that will enter into force on 1 January 2020. To date, ships have been able to use fuel with a sulphur content of up to 3.5 percent. Beginning in 2020, this sulphur content must be 0.5 percent or lower. This regulation is the largest in a series of IMO measures to reduce marine pollution.

## What do the regulation entail?

The IMO2020 emission regulation means that ships will have to significantly reduce their emissions both on the high seas and in coastal areas, as only fuel with a maximum sulphur content of 0.5 percent will be permitted in these settings. This change will affect the entire shipping industry. The good news is that the industry will become much greener thanks to the regulation.

## How will IMO2020 affect Hapag-Lloyd?

The IMO2020 emissions regulation that will enter into force on 1 January 2020 will affect the entire shipping industry – which naturally includes Hapag-Lloyd. In concrete terms, the regulation means that ships will have to significantly reduce their emissions both on the high seas and in coastal areas. Beginning in 2020, the sulphur content of the fuel used may only be a maximum of 0.5 percent. At present, the maximum sulphur content is 3.5 percent.



# Q&A – Potential solutions



## Which potential solutions are available for complying with the IMO2020 requirements?

Generally speaking, for large container vessels, there are three options that are promising for implementing the new regulation: converting to more expensive low-sulphur fuel oil (LSFO 0.5 %), using Exhaust Gas Cleaning Systems (EGCSs), or deploying ships powered by liquefied natural gas (LNG). However, the shipping industry and the majority of all vessels are expected to be operated with low-sulphur fuel oil by then. Using low-sulphur fuel oil will be the key solution for the shipping industry and Hapag-Lloyd to remain compliant. Furthermore, it is the most environmentally friendly solution in the short term.

## What are the special challenges of these potential solutions?

To date, there have only been a few experiences using, for example, exhaust gas cleaning systems on container ships or propulsion from liquefied natural gas (LNG). Another challenge, especially for LNG, relates to infrastructure: At present, there is no supply chain in place to provide ships reliably with LNG. In addition, the choice of potential solutions will affect the profitability and competitiveness of liner shipping companies for a long time to come.

Furthermore, it takes time to build new ships equipped with EGCS or designed to use LNG as fuel, and such conversions also involve significant investments. This new regulation will significantly improve the ecological footprint of the shipping industry, and the majority of all vessels are expected to be operated with low-sulphur fuel oil by 2020. Using low-sulphur fuel oil will be the key solution for the shipping industry and Hapag-Lloyd to remain compliant. Furthermore, it is the most environmentally friendly solution in the short term.

Thus, the vast majority of the global container fleet will have no choice but to switch to the new, high-value and thus significantly more expensive low-sulphur fuel oil (LSFO 0.5%), as it is available and no conversion of our vessels is required.

# Q&A – Potential solutions



## Does Hapag-Lloyd have a preference?

This new regulation will significantly improve the ecological footprint of the shipping industry, and the majority of all vessels are expected to be operated with low-sulphur fuel oil by 2020. Using low-sulphur fuel oil will be the key solution for the shipping industry and Hapag-Lloyd to remain compliant. Furthermore, it is the most environmentally friendly solution in the short term.

## Why does Hapag-Lloyd prefer low-sulphur fuel oil (LSFO)?

Using low-sulphur fuel oil will be the key solution for the shipping industry and Hapag-Lloyd to remain compliant. Furthermore, it is the most environmentally friendly solution in the short term. Furthermore, it is currently the most practical solution to comply with the IMO2020 regulation, as it is available and no conversion of our vessels is required. Furthermore, it takes time to build new ships equipped with EGCS or designed to use LNG as fuel, and such conversions also involve significant investments. Thus, the shipping industry and the majority of all vessels are expected to be operated with low-sulphur fuel oil by 2020.



# Q&A – Hapag-Lloyd's strategy



## What is Hapag-Lloyd's strategy regarding the new ceiling for sulphur content in fuel that will enter into force in 2020?

We will probably need a mix of the three solutions: switching to sulphur-reduced fuel oil (LSFO 0.5%), converting to LNG, and installing exhaust gas cleaning systems (EGCSs). We are currently evaluating these options for our future marine fuel strategy.

## Why will Hapag-Lloyd rely on a mix of different measures rather than simply using low-sulphur fuel oil across the board?

Hapag-Lloyd has very high environmental standards. Since the early 1980s, we have taken several emissions-reducing measures aimed at optimising our fleet. We would like to be a trailblazer and standard-setter in our industry – and this also applies to complying with the IMO2020 emission regulation.

We would like to test all options in practice in order to be able to implement the best mix of measures for us and thoroughly investigate alternatives to low-sulphur fuel oil – not only to comply now with the regulation in force as of 2020, but also to meet the IMO's long-term target to be emission-free by 2100.

## When will the pilots start, what will they look like in detail, and what is the envisioned test period?

We will be outfitting two vessels with exhaust gas cleaning systems (EGCSs) and converting one of our so-called LNG-ready ships to LNG. These pilots will start in 2019.

# Q&A – Hapag-Lloyd's strategy



## When will you have a final strategy for your entire fleet?

Using low-sulphur fuel oil will be the key solution for the shipping industry and Hapag-Lloyd to remain compliant. However, we are currently evaluating all realistic options for our future marine fuel strategy. To this end, we will conduct pilot projects with different technologies in order to help us analyse how they will actually perform in the real world and to thereby determine what the right mix for our fleet will be. The shipping industry and the majority of all vessels are expected to be operated with low-sulphur fuel oil by 2020.

## How much will it cost Hapag-Lloyd to have all its vessels equipped with a compliant technical solution?

On the assumption that the spread between high-sulphur fuel oil (HSFO) and low-sulphur fuel oil (LSFO 0.5%) will be 250 US dollars per tonne by 2020, Hapag-Lloyd expects additional costs of around 1 billion US dollars in the first years. Overall, the utilisation of the compliant low-sulphur fuel oil comes along with an increase in fuel costs, which experts estimate to initially amount up to 60 billion US dollars annually for the entire shipping industry.

The cost for one EGCS installation will be 7-10 million US dollars per ship, and converting a large “LNG-ready” vessel to LNG will cost 25-30 million US dollars. In this respect, we will have to factor in significant additional expenses in this area, as well. However, only a smaller portion of the fleet will receive such technological upgrades.

The majority of all vessels are expected to be operated with low-sulphur fuel oil by 2020. Using low-sulphur fuel oil will be the key solution for the shipping industry and Hapag-Lloyd to remain compliant. Furthermore, it is the most environmentally friendly solution in the short term.

## How many ships does Hapag-Lloyd have in its fleet that can be converted to LNG?

At present, our fleet has 17 ships that can be converted to LNG.





Thank you

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