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IMO sulphur caps

What do the International Maritime Organization's new sulphur caps on marine fuel mean for the shipping and refining industries?

What are the IMO's new sulphur regulations?

In 2016, the International Maritime Organization (IMO) decided to continue the offensive it began in 2005 against marine sulphur emissions in an attempt to curb environmentally damaging emissions. The IMO will place new restrictions on the proportion of sulphur in bunker fuels starting in January 2020.

Sulphur caps have proved effective in Europe and North America in special emission control areas (ECAs), as well as in China, which began implementing low emission zones in its territorial waters from 2017.

The IMO's new regulation will lower the acceptable proportion of sulphur in shipping fuels to 0.5%, from the current 3.5%. This will apply to all international shipping outside ECAs, which commonly specify lower levels close to 0.1%.

How are shipping firms likely to adapt to the new regulations?

The use of exhaust gas cleaning systems, also known as scrubbers, is a quick and easy fix to meet IMO sulphur regulations. On average, scrubbers cost around $5–10m per ship and allow vessels to operate with 3.5% sulphur fuel after 2020.

Although cheap, most scrubbers installed to date are open loop systems, which discharge sulphur into the sea rather than the air. The closed loop systems that store waste water, which is discharged at a facility on shore, are more expensive.

There are questions as to the long-term viability of open loop systems as a shortcut to compliance. The IMO is already reviewing its guidelines on the discharge of waste water from scrubbers at the request of several countries, including the UK and Germany.

The other obvious solution to the new regulation is the use of low sulphur (<0.5%) fuels, or alternative fuels and power sources

Which low sulphur fuels are likely to be in high demand following sulphur caps?

A switch to compliant marine gasoil (MGO) and ultra-low sulphur fuel oils (ULSFO) is most likely. Both fuels are more expensive than their sulphur-heavy alternatives, affecting the pricing models of charter rates.

In the face of IMO sulphur regulations, companies will have to devise various formulas that allow them to pass on higher fuel costs to the customer, while remaining competitive and maintaining margins. If they do not, they risk suffering under the new sulphur caps as margins narrow and competitive edges dull.

Even then, the use of ULSFO will often require vessel modifications of some sort, as compliant fuels are likely to have slightly different specifications to high sulphur fuel oil (HSFO).

Additional fuel tanks may also be needed, as the lack of compatibility between suppliers reduces the availability of suitable refuelling stops during long voyages.

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'With the new IMO regulations, shipping costs will rise, sour crude discounts will widen, high sulphur fuel oil (HSFO 3.5%) demand will collapse, replaced by increased demand for ultra-low sulphur fuel oil (ULSFO 0.5%) and marine gasoil (MGO 0.5%). Above average complexity and crude slate flexibility will be key to helping refiners deal with these impacts.' Sanjeev Bahl, Edison oil and gas director

An even more capex-intensive solution, liquefied natural gas (LNG), is another alternative to traditional fuels. Hapag-Lloyd estimates the cost for conversion to LNG at US$25–30m per ship.

LNG would ensure emission compliance, but the lack of infrastructure provides problems given the absence of fuelling stations in major ports.

Regardless of the methods shipping companies adopt, the IMO regulations will change the supply-demand landscape, requiring refineries to adapt post 2020.

How will refineries react to the sulphur caps?

Refineries have already begun to analyse the ability of their plants to adapt to meet the demands of IMO regulation. Of course,

some refineries are likely to find themselves better secured against the shift away from high sulphur fuels than others. The complex refineries able to process sulphur-heavy 'sour' crude to produce ULSFO or MGO will be in a better position to negotiate the change than their less complex counterparts.

For those refineries currently unable to process sulphur-heavy fuel into compliant fuels, desulphurisation is a catalyst-intensive and expensive process, which is likely to limit the appeal of upgrading sour crudes. That is, unless there is a material widening of the sweet-sour spread.

Conversely, refineries with low sulphur crude slates may suffer margin contraction, as demand for low sulphur sweet crude increases.

For the moment, refineries are actively assessing their ability to adapt to changes in the environment after IMO 2020. Most will hold off pressing the button on large capital projects until there is more clarity on the state of the market following the sulphur caps.

Which companies are likely to be heavily affected by the sulphur caps?

Producers of high sulphur crudes may suffer, as demand for sour crudes decreases and the spread between high sulphur sour and low sulphur sweet crude widens materially. This would affect Middle Eastern and South American sour grades.

Shippers, like Maersk, Hapag-Lloyd and Hyundai Merchant Marine will also be affected. Maersk and Hyundai Merchant Marine have already begun initial investments into scrubbers – Maersk with an upgrade to four of its large long range 2 (LR2) ships, while Hyundai Merchant Marine has hired Valmet to supply scrubber systems for seven new ships currently under construction, and has committed to scrubbers on 20 of its recently ordered ultra large container ships.

Unsurprisingly, scrubber manufactures (Wärtsilä, Yara Marine and Alfa Laval being four of the largest) will likely do well financially from the IMO caps, while those refiners with high complexity and crude slate flexibility, such as Hellenic Petroleum, are more likely to adapt well to the IMO regulations.

Naturally, the IMO regulations are a boon to desulphurisation technology providers like KBR and AMG Advanced Metallurgical Group.