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2020 Sulphur Cap: Is the industry ready for the long run?

A Sea Asia 2019 industry insights report

Report Summary

This is the first edition in a series of three reports produced in the lead up to the seventh edition of Sea Asia – the maritime industry’s leading forum for discussion, debate and analysis on the key trends and challenges facing the industry. Sea Asia 2019 will take place in Singapore from 9-11 April 2019.

This first report shines the light on the impending 2020 Sulphur Cap, which will be enforced by the International Maritime Organization (IMO) on 1 January 2020 as part the industry’s effort to combat environmental concerns.

It explores the long-term viability of potential solutions that can allow the maritime industry to comply with the regulations laid out by the new sulphur cap, and highlights a need for industry players to find a silver bullet solution ahead of 2020 that will not only ensure their operations are compliant, but is also commercially sustainable in the long-run.

Acknowledgements and Contributions

The development of this multi-part industry insights report would not have been possible without the insights and contributions provided by a number of the maritime industry’s thought leaders.

- Esben Poulsson, Chairman, International Chamber of Shipping; President, Singapore Shipping Association; Chairman, Enesel Pte Ltd
- Khalid Hashim, Managing Director, Precious Shipping Public Co. Ltd
- Dragos Rauta, Technical Director, INTERTANKO
- Desmond Chong, General Manager, Sinanju Tankers Holdings

These industry leaders gave their time to be interviewed for this report, providing their invaluable insights and opinions on the challenges and opportunities facing the maritime industry as the implementation of the 2020 Sulphur Cap looms.

2020 SULPHUR CAP: An Overview

In less than 18 months, the maritime industry is set to see the 2020 Sulphur Cap come into force.

As of 1 January 2020, ships trading outside the sulphur Emission Control Areas (ECAs), where the limit is 0.1 per cent sulphur, will be banned from using marine fuels with a sulphur content higher than 0.5 per cent – unless the vessel has the relevant equipment, or exhaust gas cleaning technology, to clean up its sulphur emissions. The current limit stands at 3.5 per cent.

The new regulation, enforced by the IMO, seeks to slash harmful sulphur emissions from ships and improve the industry's environmental profile.

This upcoming change has undoubtedly brought forward questions of the impact to the industry. Will there be enough supply of compliant fuels? Will potential solutions be expensive? And more importantly, is the industry ready to be compliant for the long haul?

This report delves further into some of these questions, focusing closely on how viable the potential solutions are for the long-run.

IMPLICATIONS TO THE INDUSTRY

Demand shift and price increases

One of the implications of the tightened sulphur cap will be on the fuel oil market. With demand expected to shift to middle distillate products such as diesel and marine gasoil, prices are also expected to increase.

According to Morgan Stanley, the increased demand for the middle distillate products will trigger the need for more crude and hence, Brent crude is expected to reach US\$90 a barrel by 2020¹.

Estimates from Thomson Reuters Research have also indicated that vessels using cleaner fuels that meet the IMO regulations will face additional daily expenses of about US\$6,000 to US\$20,000².

Margin pressures for refiners

The new regulations will also have huge implications on the global refinery sector such as margin pressures facing refiners as the IMO 2020 sulphur cap kicks off. The impact on margins will depend on the refinery configuration and operations, location and the type of products produced, among others.

The margins of simple refineries that turn crude into high-sulphur fuel oil will be undermined due to the expected fall in demand and thus, supply. Forecasts from the PRIA Energy Group show that by 2020, the net supply of high sulphur products could decline by 1.4 million b/d while the supply of low sulphur fuel oil will grow by 900,000 b/d³.

On the other hand, complex refineries can take advantage of the new regulations and boost their margins as they would be capable of producing large amounts of low-sulphur products.

Choosing the right alternative

Given the potential impact of the 2020 Sulphur Cap on the overall industry, shipowners now have an important decision to make: which solution to implement best to comply with the stricter regulations. There are in general three options for shipowners to mull over ahead of the new enforcement.

They can either install exhaust gas cleaning systems or scrubbers, run on sulphur-free LNG or other alternative fuels, or switch to compliant fuel options such as low sulphur fuel oil and marine gasoil (MGO).

These three options come with their respective pros and cons, which will need to be considered heavily by the shipowners. In addition to ensuring the cost-effectiveness of the chosen option, shipowners need to also take into account the sustainability of that option for the long-run.

BUT, ARE THE THREE OPTIONS VIABLE FOR THE LONG-RUN?

Out of the three, the switch to a low-sulphur fuel alternative will be the simplest and most straightforward response to the new IMO regulation, and one that will likely be taken by most shipowners.

The use of exhaust gas cleaning systems, or scrubbers, is also one alternative that is well-considered in the industry as they allow shipowners to continue burning high-sulphur fuel oil while still complying with the new sulphur cap.

That said, the impending change in sulphur regulations has also brought about many great discussions on new fuel and energy sources, with a heavy focus on liquefied natural gas (LNG). Clean and abundant, the growth of LNG has been rapid due to new supply from the Middle East, Australia and the United States.

There are certainly advantages to each of these solutions – which will be further explored in the next few sections – but industry leaders question if these solutions are sustainable for the industry for the long-term. This is especially so because these options can get costly and thus, may not be cost-efficient for the long-run.

Low sulphur fuel alternatives

The switch to low sulphur fuel or 0.5 per cent sulphur bunker fuel can be deemed as the most straightforward solution for industry players to comply with the new regulations, although there could well be operational issues. However, industry leaders have two key concerns regarding this switch: Will there be sufficient quantities of these compliant fuels worldwide? And how much more will the switch cost the industry?

According to Dragos Rauta, Technical Director at INTERTANKO, there is a real concern when it comes to the availability of low sulphur fuel alternatives.

“One could ask a simple question: since only 2,000 ships will continue to use heavy fuel oil (HFO) in January 2020, can the world afford to not provide compliant fuels to all other ships? I would expect availability problems in the initial enforcement phase. But due to the importance of shipping to the world economy, the real question is ‘How long will it take until fuel availability is achieved?’” Rauta notes.

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He adds that a key concern is one of the new fuel blends fitting well together, noting: “The concern is whether various new [fuel] blends would fit together. In other words, will there be compatibility between [the fuel blends] so that ships can use one after each other, as made available in different ports, without a risk of cross-contamination.

“The other element that would need to be addressed is the stability of these fuels – how long can they be stored on board ships without changing their quality.”

Desmond Chong, General Manager at Sinanju Tankers Holdings, also points out the complications of switching between high-sulphur fuel oil (HSFO) to low sulphur fuel alternatives, and highlights that the process can be impractical and costly especially when there is a need to ensure no contamination of fuels takes place.

“It is not normal for bunker tankers to switch between carrying HSFO and LSFO because it will take a lot to make sure that the tanks are cleaned properly to prevent contamination for each loading and delivery. An easier option may be to have them carry dedicated fuels. Consideration should also be made that the mass flow metering systems installed onboard bunker tankers in Singapore are commissioned to handle either

HFOs or distillates. They are not all encompassing, so there needs to be certainty of what fuels are required to mitigate any delivery disruption,” says Chong.

One other concern is the likelihood of a sharp rise in fuel costs. Estimates from global consultancy firm, Wood Mackenzie, indicate that in a full compliance scenario, global bunker fuel costs could increase by up to US\$60 billion annually from 2020 – almost four times that of fuel oil costs in 2016. This would be a result of higher crude prices and the tight availability and supply of MGO⁴.



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*Desmond Chong,
General Manager
at Sinanju Tankers Holdings*



Given that potentially huge sums of money might be involved as a result of the switch to low sulphur fuels, there have been speculations about the industry’s compliance with the new IMO regulations and the possibility of unfair competition and market distortion. These concerns then bring about the question of whether this option is even a viable one for the long-term.

Scrubbers

A principal advantage of installing scrubbers is that shipowners can continue to use high sulphur fuel oil as a marine fuel while still complying with the new sulphur limit. Through either the open-loop, closed-loop or hybrid systems, scrubbers remove sulphur and other unwanted chemicals from exhaust gas emitted by bunkers.

Given the advantages, it is no surprise that the Exhaust Gas Cleaning Systems Association (EGCSA) has found that the uptake of scrubbers is on the rise – as of 31 May 2018, the number of ships with exhaust gas cleaning systems installed or on order stands at 983.

This is in line with news that major ship operators such as Star Bulk and Frontline confirming that they will be using scrubbers to comply with the 2020 regulations. The former, for example, will be equipping its entire fleet with scrubbers before the Sulphur Cap deadline.

However, the installation of scrubbers comes at a cost. According to the dry bulk shipowner, Safe Bulkers, the cost of scrubbers and their installation is expected to cost an average \$2 million for an average-sized vessel⁵.

Precious Shipping’s Managing Director, Khalid Hashim, agrees, adding that it is also “tricky to retrofit [scrubbers] on existing ships”. Furthermore, he notes that scrubbers come with their own operational issues.

“Scrubbers are an old technology more suited for land-based and stationary installations than for vibrating engines at sea. [Installing scrubbers] is like asking every shipowner to install a small refining plant on top of its funnel rather than allowing the shore-based refining industry to do the needful and reduce the sulphur content at source.”

He highlights that the biggest drawback is the heavy duty pumps that would need to be installed as this will require even more power and hence, more fuel or diesel to be burnt at sea. This will add to the amount of carbon dioxide released into the atmosphere while only limiting the amount of sulphur dioxide released.

“This is not a real solution at all, especially when you consider that the next stop on desulphurisation could take the bar down to 0.1% sulphur emissions, which the current crop of scrubbers would not be able to manage,” Hashim notes, pointing to all of the environmental regulations likely to be imposed on shipping over the next decade.

Moreover, the shipping community has also raised concerns with regards to how the sulphur oxide that is removed from the exhaust of vessels through the open-loop scrubber system discharges the wash water from scrubbers into the sea⁶. Contents of the released water pose a risk to marine life, further highlighting the long-term ineffectiveness of using scrubbers.

As such, the present scrubber technology may not be a viable, long-term – and not to mention, cost-effective – solution to comply with the upcoming IMO 2020 sulphur cap.

LNG as fuel

Using LNG as an alternative fuel is another solution that is a hot debate. Its zero sulphur content and relatively low levels of nitrogen oxides emitted mean that LNG outperforms any other conventional marine fuel on a local emissions basis, allowing the industry to be future-proofed against more demanding environmental regulations.

The abundance in natural gas supply has also sparked conversations that LNG makes a more sustainable alternative fuel.

LNG does look interesting as a medium-term solution for ship propulsion after 2020, which could also help the sector improve carbon efficiency in line with the IMO target set for 2030.

Esben Poulsson, Chairman of the International Chamber of Shipping and Enesel Pte Ltd, and President of the Singapore Shipping Association

According to some estimates, the reserves for natural gas can last much longer than the world's oil reserves, which is only expected to last for another 50 years.

In fact, the LNG terminal in Singapore is now modifying its secondary jetty as part of its plan to develop the small-scale LNG

business and accommodate smaller ships of 2,000 to 10,000 cubic metres⁷. Two organisations – the Society for Gas as a Marine Fuel (SGMF) and SEA\LNG – have also been formed to promote LNG as the fuel of choice for the industry and to develop the LNG bunkering market further.

Recognising the advantages of going with LNG to not only meet the sulphur cap requirement but also protect the environment, ocean carrier CMA CGM announced in late 2017 that it had ordered nine 22,000 TEU containerships to run on LNG. These ultra-large containerships will be among the first merchant vessels to run transoceanic routes on LNG.

But as with scrubbers, industry leaders have also pointed to some setbacks of transitioning to LNG – one of which is the high costs that come with it. There are also not many LNG bunker vessels that are available today.

“LNG would be a far better solution than scrubbers, but it is also very expensive and does not take you anywhere near the path of zero carbon emission. Carbon dioxide will still be a big problem, with an expensive LNG engine on board,” according to Hashim.

As Mr Esben Poulsson, Chairman of the International Chamber of Shipping and Enesel Pte Ltd, and President of the Singapore Shipping Association, also puts it: “LNG does look interesting as a medium-term solution for ship propulsion after 2020, which could also help the sector improve carbon efficiency in line with the IMO target set for 2030. Many new ships are now being ordered so that dual fuel systems can be installed if the economics are right, and the necessary bunkering infrastructure is now starting to be developed in at least some major ports.”

The costs associated with the switch to LNG have brought about discussions that LNG is perhaps a better solution for newbuilds instead of existing ships, which will need to be converted to be LNG-compatible. Furthermore, the retrofitting of existing ships is also a complicated process that requires the modification of engines and installation of new equipment such as the LNG tanks and gas piping systems.

Is LNG then a viable solution for IMO 2020 in the long run? It could potentially be, given the abundant supply of natural gas that can be turned into LNG; but it will also be long before we see the full advantages of LNG use come into play.

Rauta believes that the switch to LNG could have taken off successfully if earlier action had been taken.

“I have seen many advantages of using LNG: It is clean, there is no need for it to be treated on board, and it is reliable and resilient, causing no engine trouble due to poor quality. It would have been a very good intermediate step forward to better and less carbon-containing fuels.

“But that would have been possible only if mandating

ships to use LNG or other gases and give up on the traditional fuel oils used by ships today. In my view, the train has left the station,” Rauta notes.

LONG-TERM SILVER BULLET SOLUTION NEEDED

Despite the different options available for industry players to implement in the lead up to the new IMO 2020 regulations, industry leaders opine that there is no silver bullet solution.

Vessel owners and operators need to not only consider the effectiveness of their chosen option in meeting the tightened sulphur cap, but also the long-term costs and commercial sustainability of that option.

And at this stage, a certain level of uncertainty still looms over the ability of the three main options to fulfil the long-term and sustainable requirements that involved industry players are looking out for.

Rauta highlights: “I cannot see there could be too many viable potential solutions except clean fuel, no matter the type. Battery driven ships will penetrate gradually, but mostly for ships engaged in coastal trade.

“I do not think that scrubbers will be on board ships for

more than five to 10 years. The high acidity of the wash-water is a challenge for the integrity of the installation. Its discharge at sea will not go unnoticed. Extensive use of closed loop scrubbers also cannot be a practical solution for many ships.”

But amidst this uncertainty, it is also key that the industry looks beyond 2020, especially with members of the IMO already striking a deal to reduce total greenhouse gas emissions by at least 50 per cent by 2050.

Hashim agrees: “The ultimate goal of forward-looking legislation will be to move the industry towards a zero fossil fuel or zero carbon fuel propulsion system for ships. That would mean that we have to move towards electrically powered ships or battery powered engines or carbonless fuel for propulsion of ships.

“This can only be done if we go back to the drawing board and see what innovative solutions engine manufacturers and the shipbuilders can bring to the industry.”

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*Khalid Hashim
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