

COMPLIANCE OPTIONS TAKE SHAPE AS 2020 DEADLINE APPROACHES

In October 2016, the IMO announced the implementation of its 0.5% sulphur cap on marine fuels in January 2020. To measure the response of the market and assess preferred compliance options, London based consultancy, The Strategy Works – on behalf of Marine Propulsion – has conducted interviews with senior technical managers within shipping companies, OEMs, marine lubricant suppliers and manufacturers of scrubbers – to map the response of the market and evaluate their coping strategies

Shipping companies with prior exposure to ECA & SECA zones (where the sulphur cap is 0.1%) are ahead of the curve and a good starting point. A third of the shipping company interview sample spend 70%+ of their time in ECA & SECA zones, but (in contrast) for half the sample it's less than 30%; balancing the mix.

Ian Thurloway – brand and marketing manager at Chevron Marine Lubricants feels that

experience of compliance in coastal areas has helped prepared lubricant manufacturers for 2020: “We’ve been, and continue to be, proactive on developing our products and solutions to meet the demands of today’s marine industry, including ECA zones and have a range of lubricants to cover virtually all marine fuel options. We have vessels that run on a single cylinder lubricant and those that run with multiple products in separate tanks - to facilitate

transiting ECA areas.”

Very few shipping companies sailing in ECA & SECA waters reported any technical issues; their main concern was about the availability of ultra-low sulphur fuel oil ULSFO going forward and uncertainty over price differentials. “The main issue is going to be the availability of low sulphur fuel options. We have already decided to switch to ULSFO, but there are many parts of the world where no such fuel is available now” said a senior technical superintendent at a leading Nordic shipping company.

Morten Hvass, head of technical operations for Clipper Group commented “Going for the options of ULSFO and/or distillate fuel is a question of price and availability in a few years’ time. Nobody can predict the price difference between the distillate fuel and ULSFO.”

For some early adopters it has been a three-stage journey on a path towards scrubbers. “We switched to gas oil initially and then to ultra-low sulphur

fuel when it was available.

We have also two new ships that have been equipped with scrubbers,” said the senior chief engineer at a Scandinavian shipping company.

Timeframe acceptable

74% of the sample felt the timeframe for implementation was fair and few were surprised by the three-year lead-in period. “We were expecting it. In Denmark, we have a shipowners’ association that voted for 2020 instead of 2025” stated Kaj Pilemand, chief technical officer at Ultraship.

Anders Wikström, fleet manager at Wallenius Marine AB agreed, saying “It didn’t surprise us at all, we knew it was coming. We are well prepared so we will have adequate time.”

This is endorsed by all the lubricant companies interviewed, as Iain White – global marketing manager of Exxon Mobil Marine confirmed. “The legislation was written as if it would be implemented in 2020, unless there was deemed to be a reason why it couldn’t be. So, no surprise at all to us.”

The survey discovered the preferred compliance options of shipping companies, as well as the perceptions held by oil majors & OEMs.

As shown by the figure on page 28, ULSFO is clearly the most popular fuel choice under consideration by shipping companies, followed by distillate fuels and then scrubbers. Lubricant suppliers and OEMs agree with the top fuel rankings



Iain White, Exxon Mobil Marine: “No surprise” on 2020 deadline

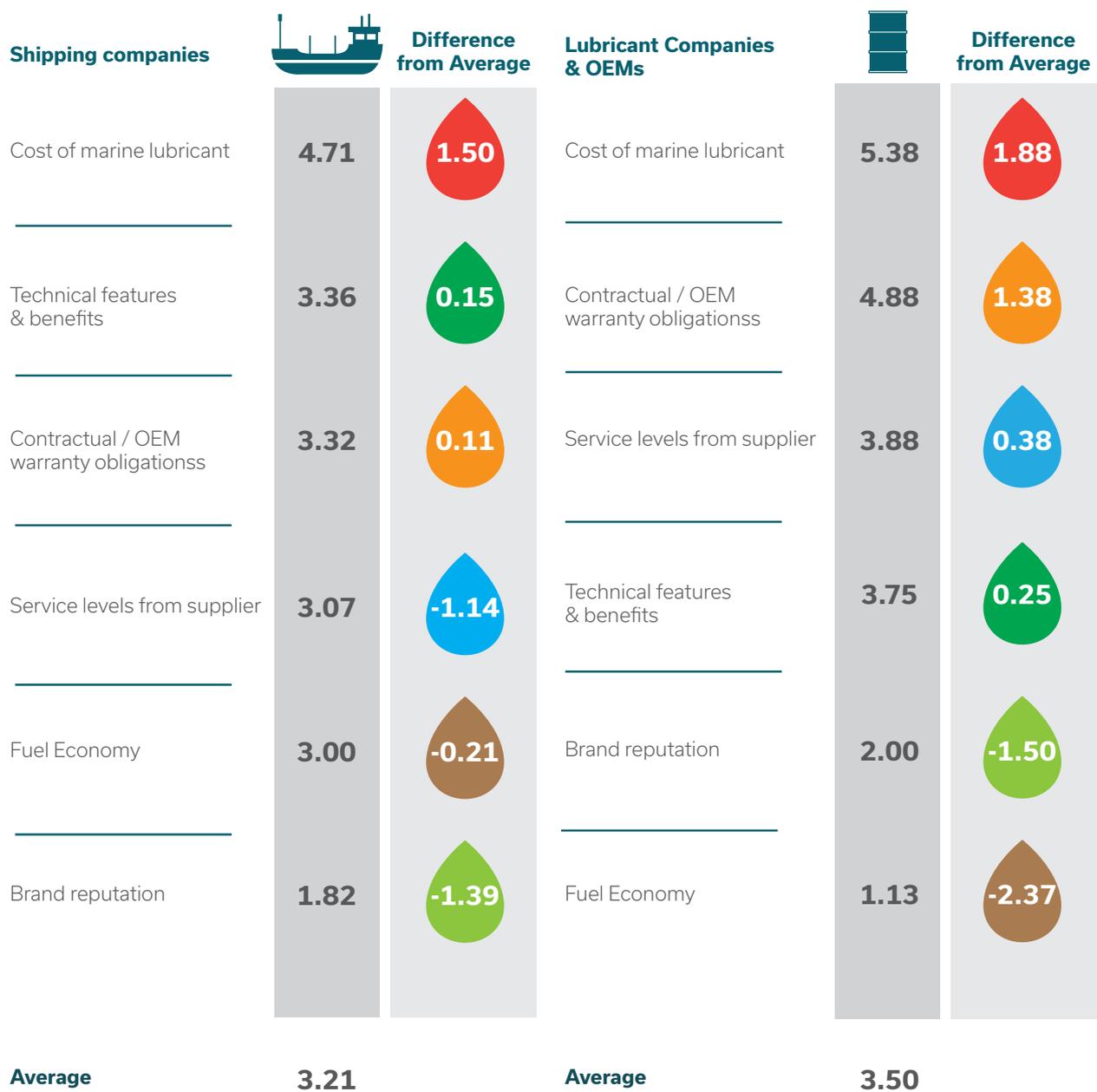


Sara Lawrence, Shell Marine Products: “It’s a charterer’s market”

FACTORS THAT DETERMINE THE PURCHASE OF LUBRICANTS FOR FOUR-STROKE ENGINES

Shipping companies vs Lubricant Companies & OEMs

Scores are ranked on a scale of 6:1 where 6 = highest ranking factor and 1 = lowest ranking factor



Figures courtesy of The Strategy Works

but believe scrubbers to be the preferred choice overall. The implementation timetable for scrubbers is more complex and is addressed below.

Biofuels is the minority option; but there is disconnect on LNG, which received a low ranking from shipping companies but is perceived as a higher-ranking option by lubricant suppliers and OEMs.

Split opinions on scrubbers

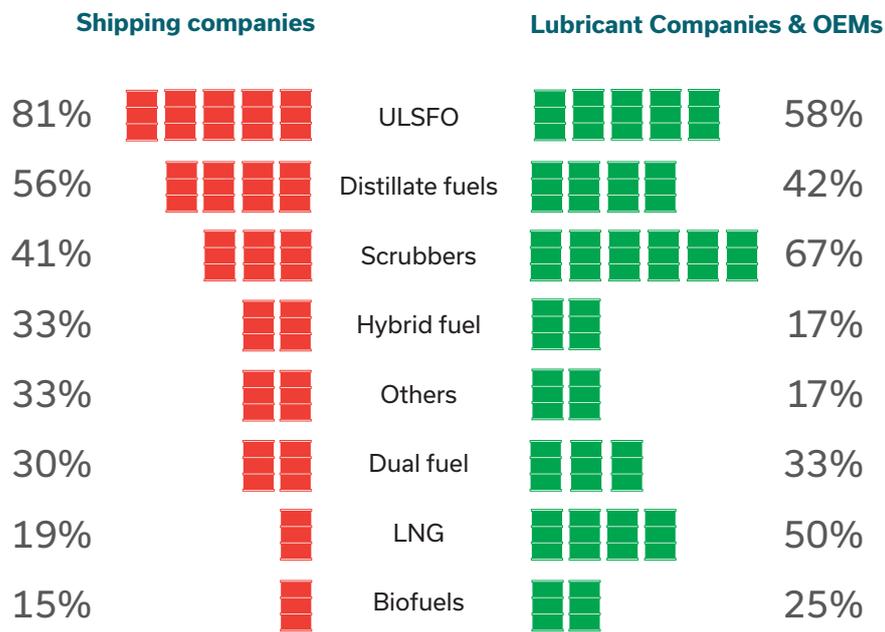
The survey also found that 56% of the shipping companies sampled views scrubbers unfavourably; contrasting with 35% who state they are under consideration. The heavy up-front capital requirement - in an environment where the impact of the 2008 recession continues to depress rates - coupled with uncertainty over investment in chartered or owner managed fleets - both strongly influence thinking.

Raj Dewan, director - procurement and technical services of Seaspan Ship Management explained "We are still learning. Capital investment is huge, that is the problem. We would like to use ULSFO instead of the expensive solution of scrubbers. If there will be availability worldwide we would prefer that, but charter customers are the ones making these decisions as the fuel supply is down to them. If it will be too expensive for them to run on ULSFO, this may force us to consider an alternative."

Iain White of Exxon Mobil agrees. "The reason that they're so slow to take off now is because of the way the shipping industry operates; it is the charterer's responsibility to buy the fuel, rather than the owner/operator. A key exception is the cruise business because they buy their own fuel. Installing a scrubber is a capital programme for the owner who has no payback until 1 January 2020. Also, as there's no compliance

TOP COMPLIANCE 2020 OPTIONS NOW CLEARLY EVIDENT

Preferred 0.5% Sulphur Fuel Compliance Options - Shipping companies vs Lubricant Companies & OEM's (Multiple Choice)



Figures courtesy of The Strategy Works

fuel available today as a reference point, nobody knows what the actual price differential is going to be, so it's hard for people to really pin down the economic case."

Sara Lawrence, global technical manager, Shell Marine Products views it in similar terms: "The reality now is that it's a charterer's market. They can push for very low prices because there's a lot of capacity. Many shipping companies simply don't have the finance to install scrubbers and they can't charge any more to the charterers for doing it. Typically the charterers pay for the fuel, the owners pay for the lubricant."

But one shipping company that has enthusiastically

embraced scrubbers is Spliethoff which has converted 20 ships - six of which operate 100% of their time in SECA zones. It plans to retrofit a further 55 vessels between 2018 and 2019, ready for 2020 compliance at an investment of €1.5-€2.0M (US\$1.8M -US\$2.4M) per ship. Spliethoff has calculated its numbers according to conversions programme manager Gerrit-Jan van Ommen. "We expect to see a return of investment on those ships after 2020 within 2-2.5 years depending on the ship size, so that is fairly quick. If you don't make that investment you're going to lose out later."

Based on data from Shell and Bloomberg, Spliethoff

expects that the spread between ULSFO and HFO (currently \$130 per tonne) will jump to \$350 - \$380 in January 2020, but has been cautious when preparing its business case. "We have used \$150 a tonne as the spread, so a two-year return of investment is based on a conservative view."

Scrubber technologies

There are alternative types of scrubber technology - 'open loop' and 'closed loop'. With open loop, the natural alkalinity in the seawater neutralises the acid. Wash water is continuously monitored at the inlet and outlet in line with IMO regulations, before it is »

» discharged into the sea without harming the environment.

With closed loop, an alkali, such as caustic soda, is needed to clean the wash water, which is then retained in the wash water tank and discharged at port.

Splithoff operates twice as many 'open loop' scrubbers than 'closed loop' and, although Belgian and German national waters do not permit discharge, Mr van Ommen is unfazed. "National waters are really only a three-mile zone from the borders of the shore, so when you compare that to global operation that's maybe 2% or 3% of the exposure of the ship," he said. "It's an inconvenience, but in terms of investment it's nothing. In those areas, we need to switch over to compliant fuels so, in other words, turn off the scrubbers and switch to low-sulphur fuels."

Splithoff favours in-line scrubbers which are easier to install, as the system only requires the same space as the silencer in the funnel that it replaces.

Mr van Ommen also sees technical benefits from maintaining HFO usage. "A blend of fuels to obtain the low-sulphur quality will very much depend on the local refinery characteristics and viscosities of the fuels can vary greatly. It's quite a challenge to handle low viscosity fuels with pumps that also handle high viscosity fuels, so one of the considerations for heavy-sulphur fuels and scrubbers will be consistency of supplies as we know them now."

Environmental impact of scrubbers

Poul Woodall is director, environment and sustainability at DFDS in Denmark - another early adopter of scrubbers - which committed about €100 million to its scrubber refit programme in 2012. DFDS now has 18 ships retrofitted.

Although financial gains are the main driver, Mr Woodall

takes a holistic perspective on the environmental benefits, saying that "scrubbers will not only take away about 80% of the particles, but those particles that are left over are larger in size than the particles generated from gas oil and therefore less hazardous. You have a CO₂ benefit from that combination as well, so I think climate and environmental together. Even when you look at LNG I think it's a better solution. I'm not in the majority on that one but I think LNG has some climate effects that we have not fully analysed."

Another Nordic shipping company sees the benefits of scrubbers post 2020. "Several of our ships are already equipped with scrubbers, five more ships are going to be equipped over the next three years. We believe this will give us a competitive advantage in the longer term because we can continue to use heavy fuel oil" stated its technical superintendent.

'Wait and see'

But many are deferring the decision until 2020 or later, with some concerns expressed about the availability of HFO in the longer term. Estimates are that current HFO supplies are split roughly 50:50 between maritime and shore-based power plants. But how market dynamics will change post 2020 is still an unknown,



Poul Woodall, DFDS:
'a holistic perspective'

as is HFO's availability in global ports going forward.

Mr Pilemand of Ultraship is one of those deferring their decision: "We haven't decided yet but will probably hold off the decision because we can still continue trading after 2020 with distillates."

Lieven Van Eetvelde, technical manager at Bocimar, is also undecided, saying "We may consider scrubbers but only after 2022. Investing US\$3M now in a scrubber for the whole fleet is a lot and if we invest in scrubbers we need to have a return; charterers will pay more for those ships so we can write off the investment. There is however the possibility of future HFO shortage in some ports; only big container ports will have it; in all other ports HFO will fade out."

Danish shipping company, Hafnia Tankers, agrees there are other considerations. "Right now, we are working on the business case, but the concern is whether we can actually get the high sulphur fuel all over the world because if you have to buy the low sulphur fuel anyway then of course your business case has disappeared...there are simply too many open ends, so a decision will be taken following evaluation next year", said Jorgen Thuesen, its technical general manager.

Uncertainty over future price differentials also adds to the confusion. "Our concern is not about technical issues or installation but about the price differences between the alternatives to HFO and the political impact. No one knows what will happen between 2020 and 2025," asserted a director at a leading Danish shipping company.

A leading OEM foresees cost advantages for the early adopters of scrubbers and believes availability of HFO will not be an issue. "Those shipping companies who have a scrubber installed by 1 January, 2020 will be in an advantageous position

because they will enjoy in the first year, very cheap prices for heavy fuel with high sulphur. You will see an absolute decrease in the prices of such fuel because demand will go down and we'll have a significant over-supply. And you will see a price increase of the distillates on the other side. You will really make a lot of money if you have a scrubber, so the only issues right now are: do you have the money to invest and will it fit your vessels?"

Uncertainty over the extent to which HFO will continue to be used after 2020 also impacts on new technologies adopted by leading OEMs such as Wärtsilä, as Kai Juoperi, its fuels and lubricants expert, explained. "We already have technologies available for very low-sulphur fuels and ultra-low sulphur fuels which include both pure distillate fuels and fuels belonging to residual fuel category. Depending on the fuel properties, we could consider which exhaust valve coating material would be an optimum choice, or there could be opportunities to develop new fuel injection systems, which can cope better with certain types of fuel. Furthermore, the fuel injection equipment design can differ depending on whether higher viscosity heavy fuels or low viscosity distillate fuels are used."

Cruise sector investing

In contrast, the more profitable cruise segment is investing heavily in scrubbers; market leader Carnival has already retrofitted 66 ships with 168 scrubbers, with more to come until 2020 and beyond on the remainder of its fleet. In fact, Carnival has recently become the majority shareholder in its Italian scrubber supplier Ecospray, absorbing most of its manufacturing capacity for the next couple of years. Franco Porcellacchia, Carnival's vice president, explained "When we started installations, we based our return of investment on a fuel price differential of US\$300

per tonne, then the differential went down to US\$200, but even at that level it is still very interesting for us. We decided to increase the number of installations to prepare for 1 January 2020 as the return on investment increases over time.”

Carnival also prefers open loop scrubbers as Mr Porcellacchia explained. “The open-loop is simpler and reliable; you don’t need to carry chemicals as an additive and we have equipment for further purification of the wash water, we can use that without any problems in port. To show compliance with the regulations, the water being discharged is monitored continually to check three parameters: PAH, pH and turbidity.”

For the 20 new vessels currently on order, a mix of scrubbers and LNG compliance options are being adopted by Carnival.

In summary, although there are notable exceptions within the cruise and ferries sectors, the fact is at October 2017 only 404 vessels globally have either been fitted with scrubbers or have confirmed they will install scrubbers in the near future, according to Stian Sollied, business development manager, DNV GL – Maritime – a leading classification society and international maritime advisor. “The business case is dependent on the price of the compliant fuel in 2020 and its relation to HFO; it’s difficult to speculate about future fuel prices but in high usage cases I think you are down to a payback of 2.5-3 years.”

Cost of marine lubricant is the highest-ranking factor in determining purchasing choice, but lubricant manufacturers are pragmatic about this and concur with shipping companies. Technical features and benefits and OEM warranty obligations also score above the mean, but brand reputation is the lowest

ranking buying attribute, which is confirmed by multi-sourcing behaviour – two thirds of the sample had two lubricant suppliers or more.

Also, within the engine specifications, ‘letters of no objection’ are widely issued by OEMs following approximately 4,000 hours of engine trials, which conveys freedom of brand choice to the end user from a list of products that collectively meet the OEMs’ requirements.

Multi-sourcing is further enabled by a perception that products from different suppliers are similar and concerns over supply security of different brands in the smaller ports. “All major lubricant suppliers offer more or less the same product, it is only the name that changes. The price criteria are applied uniformly across the fleet”, explained Morten Hvass, head of technical operations for Clipper Group.

BN/Viscosity: Technical benefits

The price/value perception is countered by perceived technical benefits from lubricant suppliers. “The main trigger points are BN drop and change of viscosity. Another key factor is the general lubricant condition – wear and tear contamination and water level,” said the



Serge Dal Farra, Total Lubmarine: “We’re helping our customers”

technical manager at a German shipping company.

A technical superintendent at a prominent Norwegian shipping company said “BN drop and viscosity increase are the main drivers but we also make a full replacement when we overhaul an engine.” Sara Lawrence of Shell agreed, saying “At the very top end, we focused on viscosity control and BN retention with our recently updated Argina products.”

According to the research, 36% of shipping companies rely on their lubricant supplier to monitor oil condition and drivers for top-up; 23% use an outside laboratory and 41% conduct monitoring on board.

Mark Wells, head of lubricants at Maersk Oil Trading, explained his company’s ‘blend-on-board’ approach. “It is slightly different because it’s not just about blending cylinder oils. It’s about taking a more holistic approach to current two-stroke engine challenges, by also focusing on the additional benefits of constant replenishment and on recycling the system oil which can also have an impact on cylinder running condition amongst other important technical aspects, such as fuel efficiency, etc.

“The blend-on-board concept works by blending system oil with other cylinder oil products and/or other components to produce a more tailored cylinder lubricant in accordance with both the fuel type in use and prevailing engine conditions.”

Serge Dal Farra, global marketing manager of Total Lubmarine, believes in monitoring the feed rate to maximise engine protection. “We’re helping our customers better monitor their engine performance through our feed rate optimisation programme. This combines hands-on

engineering expertise and advice with an extensive drain analysis programme.”

The future

Predicting the future is never easy and some question how compliance will be enforced globally to ensure a fair playing field for all, post 2020. As with any technology change, those with the will and the resources to commit investment have already made their decisions. Others prefer to wait until the supply chain tensions unfold post 2020.

What is clear however is that the top compliance options have now surfaced, so upstream suppliers of lubricants can plan ahead with confidence.

OEMs also have an opportunity to shape the future as Jose Luis Garcia, Shell’s technology manager – marine & power engine lubricants explained “There will continue to be challenges in the years to come (for lubricants), when newer more efficient, but also more severe engines (in regard of lubricant performance demands) enter the marketplace. For instance, if you think about the latest developments on the four-stroke engine technology like the Wärtsilä 31 engine – it’s a record-breaking engine in terms of efficiency.”

The implementation of the 0.5% global sulphur cap in 2020 is one of the biggest changes to affect marine fuels and lubricants in recent times. As OEMs strive to increase the efficiency of their engines, the ULSFO/scrubbers debate will continue to gather pace as 2020 approaches. **MP**

This article has been prepared by Michael Herson of London-based The Strategy Works – a strategy consultancy specialising in original B2B insight on a global basis within the shipping industry and other sectors.

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