

Circular From NORTH

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2020: A View from the Refinery

Much has been written and said on the forthcoming fuel sulphur cap which will come into force on 1 January 2020.

The majority of shipowners are likely to opt for compliant fuels rather than fit their vessels with scrubbers. But with so little known about the new very-low sulphur fuel oil (VLSFO) products expected to enter the market in coming months, it is difficult to make an informed decision on future fuel choices.

North asked two big hitters from the refinery industry – Damien Valdenaire of Concawe and Alan Gelder of Wood Mackenzie – for their thoughts on 2020 and the new fuels.

Q: Little information is in the public domain on the characteristics of the new VLSFO products expected to come on to the market in 2019. Can you share any insight?

Alan Gelder (AG): We have analysed the fuel oil composition from all 550 refineries that are over 50 kbd (thousand barrels per day) capacity and expect VLSFO supply to be tight. Given our assumptions on scrubber adoption and global compliance levels, we expect high-sulphur fuel oil (HSFO) and VLSFO to each represent about 25% of total bunker demand, with the remainder being distillates.

The VLSFO composition is anticipated to vary significantly between regions – European volumes are anticipated to contain significant volumes of low sulphur atmospheric residues, whereas Asia will contain significant portions of cracked and straight run vacuum residues, with North America comprising of more fluid catalytic cracking (FCC) products, such as slurries and cycle oils. As such, there is the greater risk of compatibility issues arising.

US tight oil, if processed in a simple refinery configuration, can provide VLSFO at small volumes. But it introduces spare residue upgrading capacity into the refining system as US tight oil contains a low portion of vacuum residue. Blending of low sulphur VGO is an opportunity but it will depend upon the relative strength of gasoline, as that is the alternative outlet. We expect VGO diversion to be modest – around 300 kbd and not sufficient to make VLSFO as readily available as current supply of HSFO.

Damien Valdenaire (DV): We see an evolution towards middle distillates and a broad variety of VLSFO products. It will vary from the current HFO type (high density, high viscosity but originating from very-low sulphur crude oil) to light-middle distillate type (density 0.87, visco ~6cSt at 100 °C). Buyers

will need to ask for a specific quality and ensure it satisfies their needs, as there will be not be a standard quality.

Shale oil could be used as the sulphur content is very low. The residue yield is very low, so it will not produce the heavy fuel oil as we know today. But it brings more middle distillates which will be consistent with an increase in demand.

Q: Do you see any clarity on the prices of distillates and VLSFO on the run up to and after 1 January 2020?

DV: No, the spread between products will be affected by many other factors. Over the last 10 years, the factor ranged from 1 to 3 for ultra-low sulphur diesel (ULSD) versus HSFO because of free market forces. Prices will be primarily dictated by the price of crude oil but the global sulphur cap and growth of VLSFO products will put more pressure on middle distillate demand.

The refiners will not have sufficient process units to remove sulphur from the heavy/residual products.

AG: Clarity on distillates and VLSFO pricing is starting to emerge. Price reporting agencies are adopting various methodologies to establish a VLSFO price and a futures market is also emerging. There is already a well-established futures market for distillates. However, Wood Mackenzie anticipates that clarity on pricing will emerge after summer 2019, when shipowners start material purchases of low sulphur fuels.

Q: How will refiners adjust to the expected reduction in HSFO demand and how do you see the long term price trend?

DV: This is the major unknown and key uncertainty post 2020. Where will the excess of HSFO go to? Is it realistic to consider that spare capacities exist (cokers, etc.) that will absorb these streams?

The market will find its equilibrium, but how long it will take is a question mark. HSFO has a value for its energy density; ultimately it can be used in power plants having the right exhaust cleaning systems in place. But any new market requires time to develop. The excess of HSFO could limit the operation of some refiners if they don't find the right outlet in good time. It may be the limiting factor for the entire supply chain.

AG: Even though the demand for HSFO from the shipping sector is projected to fall, the aggregate quality of crude oil produced will change little. As such, refineries currently producing HSFO will largely continue to do so. The HSFO needs to be consumed.

Our base case analysis suggests the refining system can process over 1 million bpd of fuel oil as a heavy feedstock, with HSFO prices weakening considerably from 2018 levels (our assessment is that HSFO's discount to crude roughly doubles in 2020). The long term price trend of HSFO is for its pricing relative to crude to then strengthen as scrubber numbers increase and a few refiners start to undertake major capital projects to upgrade the HSFO to road transportation fuels.

Q: Experts in fuel testing predict that there may be an increase in fuel oil compatibility problems in 2020. Do you see this and the quality of fuels becoming a problem for ship owners?

AG: We are aware of these reported fuel oil compatibility issues and have noted the regional variation in VLSFO composition above. The processing of very low sulphur crudes in simple configurations can supply a VLSFO that would be paraffinic in composition, as it has not been exposed to chemical conversion processes typical of more sophisticated refining configurations. Paraffinic components do not necessarily mix well with 'cracked' fuel oil components, so we expect to hear more issues around fuel oil compatibility as we approach 2020.

DV: The marine fuels at 0.50% sulphur content will be made with new components with very different properties. Therefore the stability and moreover the compatibility risk cannot be ignored. It is already widely recommended to the ship operator to minimize the mixing of fuels on board. Proactively, ISO, CIMAC and Concawe are developing a tool to determine compatibility criteria to anticipate potential bad behaviour of fuels when co-mingling occurs.

Source of Information: The North P&I Club