

IMO 2020: The fog is clearing

Prices point to significant advantage for scrubber-fitted ships

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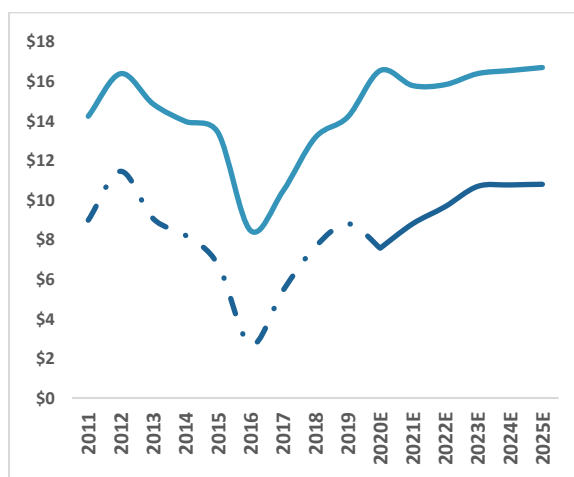
Key Takeaways

- In less than 45 days, one of the most significant changes in the maritime and refining industries is about to occur: A new type of fuel, previously absent from the energy markets, will become the dominant bunkering product globally. Although the industry is prepared for the transition, there will be various glitches and mishaps, but at the end of the day, change is coming.
- Fuel prices are already reflecting the various adjustments in refining and bunkering operations. From widening sweet-sour spreads and widening cracks, to differences in pricing across major bunkering ports, opportunities for investors are everywhere. For shipping, however, the variability of bunker prices as well as actual availability of product will be front and center throughout 2020.
- We believe VLSFO prices will remain well above Brent parity for our forecast period, while HSFO prices will move just above coal parity towards the end of the forecasted period. Scrubber adoption will increase, though the risk of regulatory action against scrubbers remains.
- Scrubbers are already proving to be an excellent investment, as for most ships the payback

period stands now at a year or less, with the ability to fully hedge that in the futures market.

- The potential to refine sweet crudes and produce VLSFO can deliver superior returns on investment, especially in regions that are lacking simple refining capacity. Complex refineries will see even higher benefits, given the oil price differentials or the ability to process high sulphur fuel directly. However, the upfront upgrade investment is substantial and debatable even with such strong economics.

Figure 1. Crack Spreads, Gasoil and VLSFO in USD/bbl



Source: Bloomberg and Breakwave Advisors

45 days to go

Change is coming in the global shipping markets. As of January 1, 2020, all commercial ships will switch to a new type of fuel with low sulphur content or will need to have Exhaust Gas Cleaning Systems (scrubbers) installed in order to comply with the IMO 2020 sulphur cap regulations. This is the most significant change in marine fuel in decades and will have a profound impact on shipping, refining and broader energy markets. (for further information on IMO 2020 and its impact on shipping please visit: <https://www.visualcapitalist.com/imo-2020-the-big-shipping-shake-up/>)

The purpose of this short paper is to look into the fuel price impact on different parts of the refining and bunkering chain and provide our house view on future pricing.

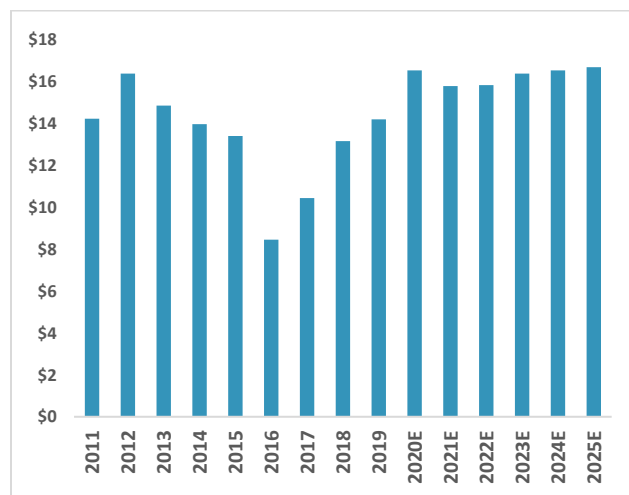
Although pricing is of course dynamic, the main elements that shape up the futures curve and thus investor expectations about the market balance, are already in place and easy to identify. That was not the case a year ago, when uncertainty over availability of fuels, scrubber installations or even the actual implementation of IMO 2020 was frequently called into question.

Refining

We expect refiners to mostly benefit from the distortion in pricing that IMO 2020 brings. From distillate pricing, to widening oil spreads, to localized price differentials, the refining industry will most certainly have more winners than losers. However, we don't anticipate significant price swings relative to what the futures markets already reflecting. The supply/demand dynamics have been researched and documented extensively, and although reality always differs, our view is that prices today reflect the upcoming change quite accurately.

On distillates, crack spreads are stronger and will remain so for the foreseeable future. This is something that most analysts have well documented, as demand for such product will increase irrespective of the reaction to the rest of the fuel complex.

Figure 2. Rotterdam distillate crack spread, USD/bbl



Source: Bloomberg and Breakwave Advisors

Marine Fuel Forecasts

It is tough enough to estimate prices with long history of data, so it becomes even more difficult to forecast prices for something that a year ago did not really exist. Very Low Sulphur Fuel Oil (VLSFO or MFO used interchangeably here), the new, compliant fuel with sulphur content of up to 0.5%, will become the dominant marine fuel for year to come. Given that such product is currently a profitable cut in the refinery operation (i.e. positive crack spread versus HSFO that has been a residual product and not a profit center for refiners) it will be useful to see what proxy is more relevant in order to estimate the price of VLSFO to an existing refined product price.

As we head into 2020 and beyond, sulphur increasingly becomes the focus during the refining process. Whether this is during the Atmospheric

Distillation process or the Vacuum Distillation process, the residual, in either case need to comply with the 0.5% minimum sulphur level (note: we are focusing on the compliant marine fuel production, as some refiners will continue to produce HSFO as a residual, and sell that to either power generation customers or ships with scrubbers installed). Given that Vacuum residuals, mainly comprised of high sulphur fuel, will not be an economical product anymore, a refiner has the option of stopping the distillation process in the Atmospheric stage or continue to the Vacuum distillation process aiming at producing more Vacuum Gasoil, a profitable product based on existing crack spreads.

As a result, a refiner needs to weigh what is more economical, always based on the configuration: proceed and vacuum-distil the Atmospheric Residual or stop at the Atmospheric level and aim at producing a residual fuel with sulphur content on less than 0.5%.

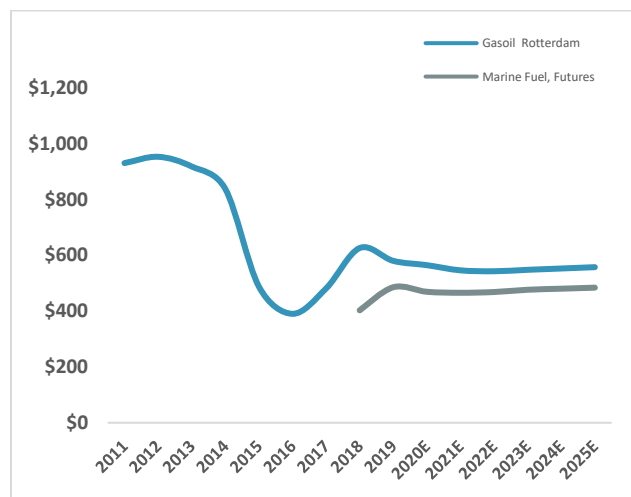
The above dilemma highly depends on the crude slate and the respective characteristics. About 28% of the global crude oil today has a sulphur content of below 0.5%, which, can produce relatively high yields of compliant fuel (although due to viscosity characteristics, we believe the actual number is closer to 12%). Any residual left in such process has a relatively low sulphur content but can always further be processed to produce more valuable low sulphur vacuum gasoil. As a result, the economic decision the average refiner has to make is whether to go ahead and process the residual to vacuum gasoil or sell the residual from the Atmospheric distillation as marine fuel; more simply put, what is more profitable for them, Marine Fuel, or VGO (and some MFO)?

We believe that the price of Marine Fuel should trade close to the price of VGO, albeit lower given the additional MFO produced during the Vacuum distillation process. Given that VGO has historically traded at a discount to diesel prices (~55/ton discount) we expect Marine Fuel to closely follow Gasoil prices and trade a discount to Gasoil, at least

during the forecasted period, given the above economics.

As a result, and given there is a relatively liquid Gasoil futures curve, by applying a discount to such curve (initially equally to ~60/ton) we can reasonably estimate the future price of Marine Fuel.

Figure 3. Gasoil and Marine Fuel, USD/mt



Source: Bloomberg and Breakwave Advisors

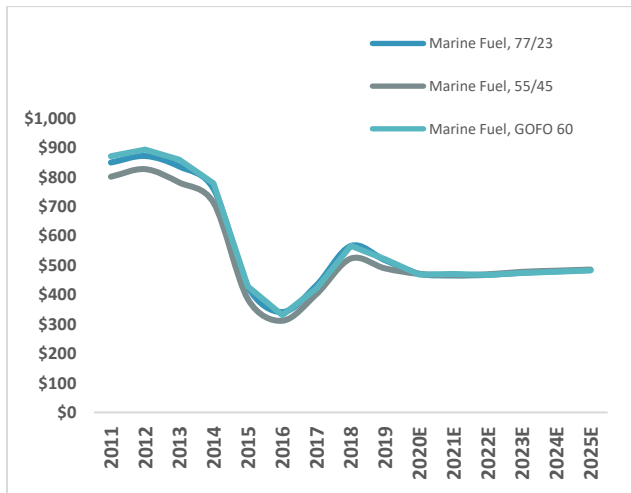
How about blends?

One of the most useful methods to estimate the price of Marine Fuel has been to use “sulphur blending” formulas where by mixing appropriate amounts of HSFO and Gasoil one can produce a product with 0.5% sulphur content and thus use the prices for Gasoil and HSFO in order to estimate the future price of Marine Fuel.

Such method has tis merits, but we believe it is unlikely that the dominant fuel in the future will be just a blend (the inclusion of Gasoil in a blending formula risks Gasoil induced thermal socks to the engine, as well as other engine related issues due to the low viscosity/lubricity of the fuel as well as its flashpoint, but for now, we are just exploring the price economics of such exercise). Rather, a straight run fuel oil is the most likely product that will become the benchmark for Marine Fuel.

However, for forecasting purposes, we also used this method and compare it to our “fundamental” pricing method as described above. As the graph below shows, using different types of existing fuel and blends, we come to a futures curve that is quite close to the existing one currently trading.

Figure 4. MFO estimates by method, USD/mt



Source: Bloomberg and Breakwave Advisors

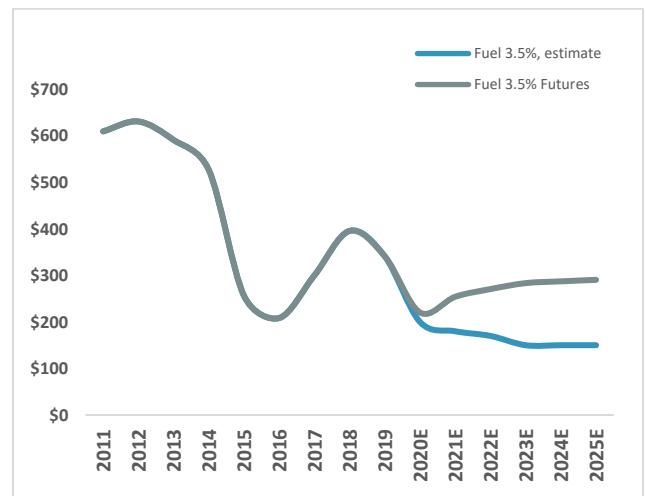
HFO not dead... yet

High Sulphur Fuel Oil is rapidly disappearing from global bunkering markets and although demand for some such fuel will remain alive due to scrubber-fitted ships, that will represent less than 15% of the global bunkering market. However, production of such fuel will not cease. As a residual product of the refining process, HFO will remain part of the global oil market for years to come, looking for a new home. Power generation, asphalt production, reprocessing in more complex refineries and of course, scrubber-related demand, will be the main demand areas for such fuel.

We believe supply of such product will be reduced, as any possible effort will be made by refineries to maximize profit and reduce production of a money-losing product. Scrubber uptake will increase over time (absent any new regulations) and demand for HFO will also increase faster than other products, after collapsing in early 2020.

However, we believe the current futures curve is quite optimistic for the demand of HFO and is pricing an unrealistic scenario when it comes to the supply/demand balance of the market. Our view is that any demand recovery will be much more gradual and very fragile, thus we expect HFO prices to hover at low levels without any meaningful recovery for the forecasted period. Such a scenario will further increase demand for scrubber installations, but there will be enough HFO around to satisfy such increase.

Figure 5. HFO futures and estimates, USD/mt



Source: Bloomberg and Breakwave Advisors

Overall, we believe HFO prices will decline towards coal parity and remain close to such levels during our forecasted period.

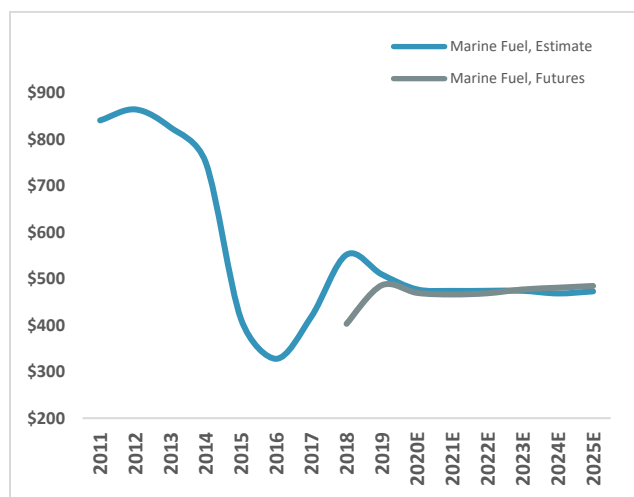
Marine Fuel forecasts

We anticipate a wide adoption of the new, low sulphur fuel and increasingly reduced use of MGO, which initially will be the fuel of choice during the transition period. Availability and familiarity with MGO are significant in the shipping market, and as such, it will be the initial fuel of choice. However, a number of operational drawbacks exist with the use of MGO (relating to low lubricity, low viscosity and low flashpoint). As ship owners become more familiar with the new fuel and price differentials remain in favor of using MFO instead of MGO, there

will be a rather rapid switch to MFO, subject to port availability. Headline freight rates remain at relatively low levels, and bunkering prices is still a very important component of vessel profitability. Dry bulk will see a faster adoption of MFO, followed by tankers and containers. Larger vessels that predominately run on long-haul voyages will be the first adopters of the new fuels, while smaller, more localized traded vessels will stick with MGO for a slightly longer period.

We expect Marine Fuel to trade at a 50-100 USD/ton discount to MGO for the forecasted period, providing a strong incentive for shipowners to install additional scrubbers, as the spread between the two fuels will remain wide enough to provide payback periods of less than 2 years, in most cases.

Figure 6. MFO futures and estimates, USD/mt



Source: Bloomberg and Breakwave Advisors

Beware of a broader change brewing

Even as we enter a new era for marine fuels, such period won't last long. A global push for reduced carbon emissions is rapidly becoming a dominant force in shipping, and change will once again come faster than most people anticipate. Although now the focus is on sulphur content, the discussion will change to engine efficiencies, speed, and energy saving technologies. Scrubbers, although a relatively low-cost solution to the sulphur problem, remain controversial and risk regulatory action if there is any conclusive proof of environmental impact. However, for now, there is still a unique opportunity to benefit from the fuel imbalances and the relatively low cost of scrubber installations, something that is certainly subject to capital access and balance sheet strength of most shipowners.

In conclusion, shipowners who have or plan to fit scrubbers in their vessels will be the clear winners of the IMO 2020 change, followed by complex refineries that have the ability to further process residuals to cleaner fuels. Producers of sweet crudes, especially heavy sweet types, will also see strong margins, as demand for such slates will remain strong. Finally, the environment is the clear benefit, that despite the associated costs of the transition, will see cleaner skies, healthier air and an improvement in environmental conditions worldwide.

Investing in futures can be volatile and is not suitable for all investors.

Trading security futures involves the risk of loss, including the possibility of loss greater than your initial investment. Security futures may not be suitable for all investors.

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