SEA CHANGE AHEAD IMO 2020

PART 2

By Tom Murray

Part 1 examined the origins and impact of IMO 2020 and it's expected future negative impact on demand volumes and pricing for High Sulfur Fuel Oils (HSFO) and, by extension, for all used lubricating oils that are blended to make HSFO. This Part 2 examines the effects of IMO 2020 on specific segments of the used oil industry, including gatherers (collecting and selling used oil), distillers (making VGO or MGO), and re-refiners (making base oil), and the options and strategies that can preserve or enhance value for these participants.

As January 2020 approaches, and the IMO 2020 regulation limiting the maximum sulfur content in marine fuels worldwide to 0.5% on 1/1/2020 takes effect, total worldwide demand for High Sulfur Fuel Oils (HSFO) is expected to drop by over 80% due to reduced demand from shipping as HSFO is substantially displaced by Very Low Sulfur Fuel Oils (VLSFO). Concurrent with the forecasted drop in HSFO demand are forecasted futures HSFO price declines by over 25% (as of August 20, 2018). The direct market impact on used lube oil (and its improved product Residual Fuel Oil or RFO) depends largely on how much used oil/RFO is being blended to make HSFO since most of this will need to find new outlets as HSFO volumes decline. But buyers and sellers will also be affected by where they sit in the value chain ranging from used oil/RFO to final products, as well as their geographic location. Potential strategies to address the effects of IMO 2020 are driven by these same factors but it is valuable to first consider the total United States volume of used oil/RFO that may be affected by IMO 2020.

The direct impact of IMO 2020 in the United States will be limited to that portion of the estimated 1 billion gallons of used oil/RFO that is currently being sold into the HSFO market. Together the existing distillers and re-refiners have the capacity to process about 60% of the available used oil, leaving about 40% available for the burner fuel market. That 40% (or about 400 million gallons) is being sold not only to make HSFO but is also marketed as burner fuel in asphalt plants, industrial burners, and other direct burners (space heaters, greenhouses, etc.) Industry sources have estimated the volume of used oil/RFO blended to make HSFO as low as 8% of the available 1 billion gallons, with high end estimates of the used oil/RFO blended to make HSFO varying widely. An approximate breakdown between burner fuel, re-refined, and distilled markets is shown in the next column.

Assuming no other market outlet emerges pre-IMO 2020 for the displaced used oil/RFO, as HSFO volumes and prices decline then, in most coastal locales the used oil/RFO volumes being blended to make HSFO is also expected to decline, along with used oil/RFO prices. Inland markets may also see a ripple effect downwards in pricing as current inland used oil/RFO being sold into HSFO markets on the coasts seek better valued inland markets. Timing is likely to be a factor as well as the initial shock of IMO 2020 may result in fast and far price declines for used lube/RFO. Over time markets should adjust to where alternate outlets are identified to absorb the excess used oil/RFO at some floor (or better pricing) level.

Estimated US Disposition of Available Used Lube Oil by Market

Market	Gallons Per Year (mm's)	Number of Plants	Volume Percent *
Burner Fuel	397	n/a	40%
Re-refined	336	9	34%
Distilled	267	9	27%
Available Used Oil	1,000	18	100%

* volume does not add to 100% due to rounding

To assess the effect of forecasted volume and price declines in used oil/RFO it helps to first understand the value chain for used oil/RFO and the products created from it. The value chain starts with generators (quick lube shops, car dealerships, maintenance shops, fleet operations, industrial users, etc.) who sell used oil generated by their services to gatherers, who collect the used oil for sale to aggregators, who in turn sell used oil to any of: 1. direct burners (such as asphalt companies, industrial burners etc.), 2. distillers who make VGO (or other products that are blended into fuels, such as Marine Diesel or Marine Gas Oil), 3. re-refiners who make base oils (of varied quality levels) and 4. blenders who make HSFO. A few companies have integrated operations combining gathering, aggregation, and distillation and/or re-refining.

The effect of a price decline of used oil/RFO on a participant depends in large part on where they sit in the value chain. For distillers and re-refiners already processing used/RFO oil into higher valued products such as MGO/VGO or base oils, simply doing nothing (other than de-bottlenecking capacity wherever possible) and letting the market do its thing is a very attractive option, particularly where demand for used oil/RFO is expected to decline precipitously. Thus a processer can simply continue to operate business-as-usual and benefit from a future drop in feedstock costs.

For gatherers however, IMO 2020's potential effect is a potentially rapidly declining market demand and value for their products. To the extent a gatherer's products are sold to make HSFO (either directly or through aggregators or blenders) pure play gatherers selling used oil/RFO face: 1. a large and rapid potential drop in demand or prices (or both), 2. uncertain options for preserving existing revenue levels, and 3. not much time to implement a beneficial solution. Because gatherers face downside risk (versus distillers or re-refiners) and IMO 2020 is relatively near, the remainder of this Part 2 article focuses largely on the varied options, strategies, and timing for gatherers in the upcoming IMO 2020 world.

Gatherers have multiple options which generally fall under the following strategies: 1. do nothing and hope that either, a. HSFO is such a small portion of the burner fuel market that the excess used oil/RFO is easily absorbed, or b. HSFO survives as a viable market outlet, 2. secure alternate sales outlets or terms for their used lube oil/RFO with guaranteed minimum volume requirements, and price their sales against crude oil, VGO, MGO, diesel, base oil, or other products, or some combination of these (in short, price against anything but a declining valued HSFO), 3. re-deploy or shift assets into new services or markets, 4. sell their company, or 5. develop or partner to create processing capability that will ensure a steady, long term, viable market outlet for their used oil/RFO products. Each of the above options is explored next.

For gatherers which are currently selling used oil/RFO into the HSFO market (whether directly or indirectly) a do-nothing strategy is the most risky option. As of August 2018, there is no market, or combination of markets, that appears able to absorb the massive excess quantities of HSFO that are forecasted in 2020. In fact, as noted in the Part 1 article of this series, the volume shift away from HSFO looks to be about

1.4 million barrels per day (over 21 billion gallons per year, which is a volume decline of about 80%) and the forward curves show an HSFO price drop of over 25% (as of August 20, 2018.) Thus, if a gatherer's end buyers of their used oil/RFO are tied to the HSFO market, a do-nothing strategy is like playing a game of musical chairs where 8 of the 10 seats will vanish by the end of 2019 (representing an 80% volume decline), and the remaining 2 chairs will be at least 25% smaller (representing a 25%+ forecasted future price decline). Statistically speaking, a do-nothing strategy for these gatherers is high risk.

The second strategy a gatherer can pursue is to secure outlets from buyers with pricing indexed off higher valued products. This can be an excellent strategy if the buyers also provide for minimum volumes. Minimum volumes are important because without minimum volumes, a buyer may source their volumes on the spot market from other gatherers which are desperate to find buyers for their used oil/RFO at almost any price. Thus, since used oil/RFO is expected to be widely available come IMO 2020, an off-take contract that protects the gatherer on price only and not volume as well may be insufficient to protect the gatherer's revenue stream.

Gathering assets in trucks, people, and collection sites could be re-targeted towards servicing other markets. Possible new service lines could be waste water or other treatment areas within environmental services. While the new markets may not be as large or attractive as used oil, they could provide a time bridge to support sustained operations until the used oil/RFO markets establish a new equilibrium in the post IMO 2020 period.

A company sale could be attractive except the optimum time to sell is now probably passed as buyers must consider IMO 2020 and price in a discount based on a major expected decline in revenues as IMO 2020 devastates the HSFO

market. One strategy to enhance sale value is to aggregate operations and sell several gatherers in a single transaction, since larger sales typically garner higher prices. However, such negotiations can be complex and difficult and time is short. And this further assumes a buyer is interested in purchasing a gathering operation before IMO 2020's impact affects their earnings. For the buyer, locking in a price now for a gathering operation is like trying to catch a falling knife. Yes, it is possible but it is also very risky.

The final option for a gatherer is to develop or partner up to create a secure outlet that can process their used oil/RFO into higher valued products. This outlet then provides a higher value and guaranteed long term off-take, effectively providing a long-term hedge or even competitive advantage against gatherers that lack such an outlet. For gatherers seeking greater control of their own destiny, locking in a friendly off-take source by participating in a plant can be an attractive strategy. However, developing a plant requires taking on new risks, with returns completely dependent on the expected plant economics.

Ultimately for the gatherer looking to participate in a new business venture, it all comes down to balancing returns (what value can I receive for my used oil/RFO?) and risks (how can I know that the plant I hitch my wagon to will be successful?) Plant economics (and thus returns) will depend largely on: 1. size (since larger plants are generally more capex and opex efficient) implying access to capital, 2. technology, which requires the ability to select the right technology for the market, and 3. project execution, including financing, engineering, constructing, and then operating a far more complex processing facility than is typically found in a gathering operation.

Plant development risks can be mitigated by joint ventures and/or collaborating with other complementary gatherers (eg where customer bases largely do not overlap) and by accessing experienced third-parties. For the gatherer, it is critical to enlist an experienced third-party developer who can select the best technology (including evaluating product quality, product yield, capex, opex, scalability/reliability, by-products, emissions, and intellectual property considerations), and manage the financing, site selection, project planning, permitting, engineering, construction, and ensure there is a strong operating team to run the plant. As good and bad examples, third party developers were successfully employed in some ethanol plants where farmers sought better value for their corn but did not feel comfortable developing a plant themselves. But as bad examples, some farmers tried to develop plants themselves and learned first-hand the difficulties of managing what turned out to be a fundamentally different business operation and model than farming. As another industry example, third parties have provided strong development expertise in the electric power industry with great success.

As we noted in Part 1 of this series, major uncertainty exists with changes ahead resulting from IMO 2020. Although the forecast for both used oil/RFO pricing and demand volume in the marine markets at this time is now downwards, any move upward in crude oil prices would help improve fuel market prices and thus used oil/RFO values. And exhaust gas cleaning systems (aka scrubbers) may be added in many more ships than is occurring today and/or in the coming years existing refineries may decide to add carbon rejection units (aka cokers, vis-breakers, de-asphalters), either of which would help absorb some of the huge excess HSFO volume

expected in 2020. Moreover, gatherers with a 3 to 5 year time horizon can take comfort in some aggregate numbers. The total volume of all mineral oil base stock gallons produced worldwide is about 17 billion gallons per year. Assuming ½ of this is collected, then worldwide about 8.5 billion gallons of used oil is available to be processed into higher valued products. Properly implemented, virtually all the 8.5 billion gallons of used oil is economically convertible into excellent, very low sulfur marine fuels. And since the forecasted volume shift towards Very Low Sulfur Fuel Oils alone is expected to exceed 21 billion gallons per year, just the likely upcoming demand volume increase in Very Low Sulfur Fuel Oils is about 2.5x the total volume of all used oil collected worldwide. Moreover, very strong economics are associated with some upgrading technologies. These returns should attract capital to support new fuels plants that offer used oil gatherers a new, and deep, fuel market outlet. So gatherers that can weather the near-term IMO 2020 storm may find this sea change actually works to their benefit over time, provided they can manage the transition to the new modern fuels that will sustain used oil demand in the coming years. ■

Comments on this article are encouraged and may be directed to Tom Murray. Tom Murray has developed technologies in used oil re-refining for over 2 decades and currently offers proprietary licensed solutions for processing used oil and other feedstocks, with 4 issued patents and multiple pending patents. He may be reached at tgm@modernfuels.com or 940-300-8790.