Superior Sustainability

Taking a comprehensive approach, from production to compliance and beyond

Sustainability is essential for any company that wants to remain successful in business. Yet not everyone agrees on what makes a company or a product sustainable. To some manufacturers, sustainability simply means being biodegradable, eco-friendly or just "green." But lubricant manufacturers need a broader and deeper understanding.

A comprehensive approach to sustainability means ensuring each step of the manufacturing process is sustainable — including formulation, storage and shipping. But it also means addressing customer expectations for safe, sustainable products while remaining compliant with government regulations. It isn't easy or straightforward, but it is the way forward. Reducing environmental impact and ensuring safe handling is a balancing act that involves weighing costs and consequences along with a company's carbon footprint through every phase of a product's life cycle.

Prioritizing the Objectives

"One of the primary goals of any lubricant is to reduce friction," which directly relates to energy consumption, noted Jim Fitch, CEO of Noria Corp. "The better the lubricant is at reducing mechanical friction, the lower its carbon footprint. But that's just in terms of the end user. There are points throughout the manufacturing and distribution processes where the carbon footprint can be lowered and where we can improve sustainability. As an industry, we're making progress in these areas, but it's never-ending. There are all kinds of ways to do a better job at reducing energy consumption that has a carbon footprint."

One of the challenges is the fact that sustainability is only one of the objectives manufacturers are working to achieve. No matter how strong a company's commitment to sustainability

Current base oil margins are likely to ease slightly because of a combination of rising crude prices and improving base oil supply availability. But they are likely to remain much firmer than usual.

Supply is likely to rise on the back of a combination of ebbing demand, rising production and shipments from other regional markets at more competitive prices. These factors are expected to outweigh margin support from a possible downward adjustment in crude values later in the year as OPEC+ targets a full end to oil production cuts by September 2022.

U.S. PRICES TO FACE PRESSURE FROM INCREASED AVAILABILITY IN EUROPE, ASIA

U.S. base oil values also face pressure from increasing availability in markets like Europe and Asia-Pacific. Firm and rising U.S. prices have helped to widen the arbitrage to move supplies from those regions to the U.S.

Logistical issues have complicated such moves. Any improvement in these logistics would facilitate the shipment of even more supplies to the U.S.

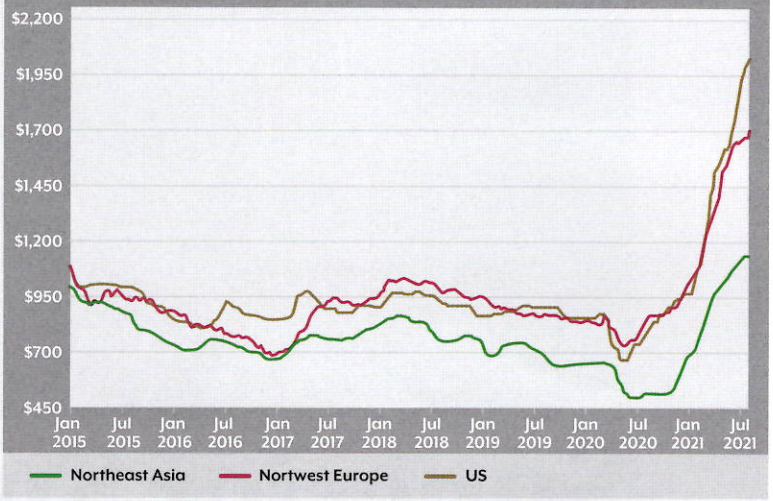
Prices for supplies from regions like Asia-Pacific and Europe have become even more competitive versus U.S. supplies since June. The trend has boosted interest in moving more Group I and Group II from Europe, the Baltic region and Asia-Pacific to the Americas. The trend reflects weaker demand and increasing supplies in those regions following the completion of plant maintenance work.

Argus export spot U.S. Group II N100 and N220 price premiums to FOB Asia N150 prices in late July had risen to their highest in more than a decade and significantly higher than historical levels.

U.S. Group II heavy-grade prices have also extended their rise relative to prices for Asia-Pacific supplies. Argus export spot U.S. Group II N600 premium to Asia FOB N500 prices rose to a record high in late July.

The growing availability of overseas supplies is likely to put more pressure on U.S. base oil prices as buyers seek to both secure supplies and maximize their procurement of supplies at more competitive prices. The premium of U.S. Group II base oils over FOB Asia prices is forecast to narrow over the next 12 months as supply tightness eases.

ARGUS SPOT GROUP III 4CST ASIA, EUROPE & US PRICES ($/MT)



RECORD-HIGH GROUP III PRICES ALSO FACE DOWNWARD PRESSURE

U.S. Group III 4 cst prices are also the highest among the major regions. The trend reflects a combination of limited supply and firm demand in the U.S. and Latin America.

The U.S. is structurally short of Group III production capacity and relies on imported supplies to cover most of its requirements. More recently, a drop in Group III supplies from Europe and South Korea has exacerbated the effect of that reliance on overseas shipments. Supplies fell because of a heavy round of plant maintenance work in those regions.

Most of that maintenance work has now come to an end. As availability improves, producers are likely to target higher-priced outlets like the U.S. These moves would put pressure on outright Group III prices in the region, though Group III 4 cst prices are still expected to be close to their highest in a decade.

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By Robert Bittner

may be, it can never be a manufacturer's foremost concern. A host of other factors must necessarily affect production.

"If you're putting a lubricant in a commercial aircraft's hydraulic system that controls the landing gear and the flight control, your No. 1 objective is to do everything you can to make sure the people on that airplane get on the ground safely. So, your highest-level objective is going to be safety," Fitch pointed out. "Your concern about the environment is minimal.

"Or look at the big turbine generators in use at power plants. Downtime can cost more than a million dollars a day." If those turbines are not generating electricity, they're losing money, and thousands of customers are losing vital services. "So, there the focus is more on reliability, repair costs and reducing downtime more so than how much fuel that machine might be consuming in the process.

"We have to balance all of our objectives: safety, reliability, sustainability and the environment," he said.

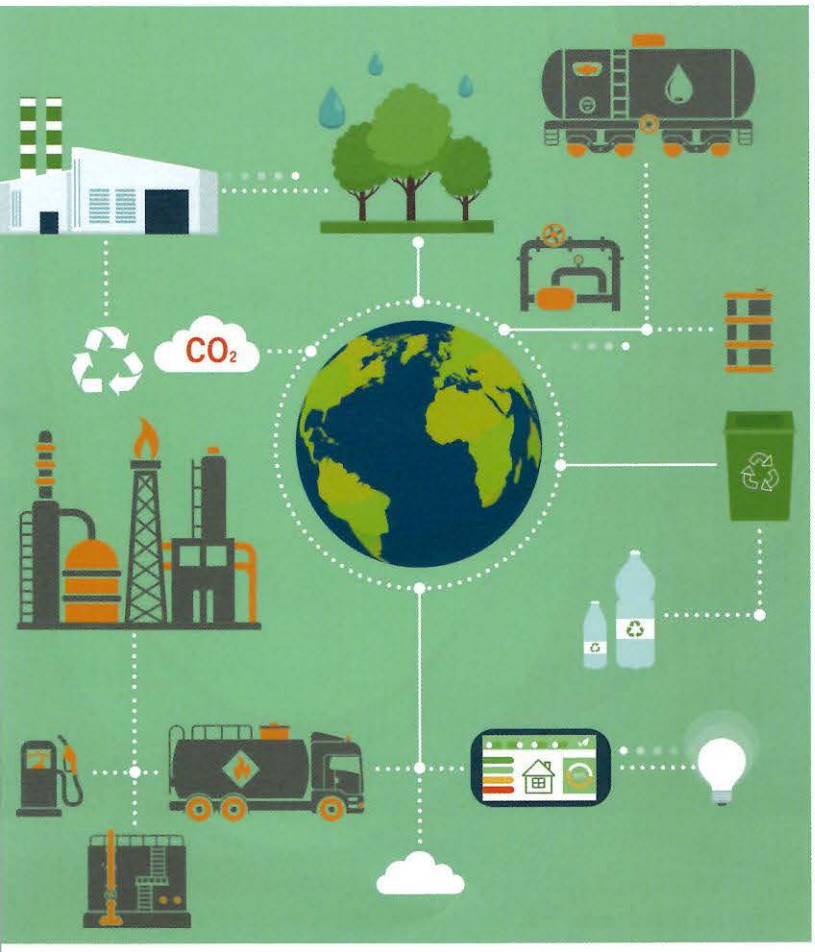
Measuring Your Footprint

The first step to improving sustainability is assessing your current carbon footprint.

"Lubricant companies must take a detailed look at each aspect of their process and value chain, looking for ways to reduce their impact," said Apu Gosalia, independent sustainability expert and partner at Germany-based sustainability consultancy Fokus Zukunft. That means questioning every element in the process, asking: "How sustainable is production? How much energy and water are consumed during production? Are the products sustainable at the point of end use? What comes before and after the blending process that may affect the environment? How high is the corporate carbon footprint? How high is the product carbon footprint?"

For accurate answers, Gosalia recommends making a comprehensive assessment of the carbon dioxide emissions at your own operations that are generated through heat, fuel and electricity consumption in production, administration — including business trips and employee commutes — and waste generation. This should include direct emissions from owned or controlled sources and indirect emissions from purchased energy, as well as all other emissions in a company's value chain.

Once you have a complete picture regarding carbon dioxide emissions, the next step is to look for opportunities to reduce those emissions. "For instance, about 80% of the emissions of a typical lube manufacturer are caused by heat and electricity consumption, making energy efficiency



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Apu Gosalia, *Independent Sustainability Expert and Partner, Fokus Zukunft*

an important lever in avoiding and/or reducing carbon dioxide," Gosalia said.

Look for ways to offset unavoidable carbon emissions through local, regional and even global compensation measures. These typically involve the promotion of and investment in eligible climate-protection projects in socially, politically and economically disadvantaged areas.

Finally, focus on the carbon footprint of the products themselves. "About 90% of the product carbon footprint of a lubricant comes from the raw materials," Gosalia said. "Lube manufacturers should be asking: 'Where do the raw materials come from? How sustainable is my supplier? How sustainable is their supply?'"

By stressing sustainability with suppliers, lubricant manufacturers can work to reduce the product carbon footprint both of their lubricants and of the raw materials that go into them.

Leading the Way

In Fitch's experience, such sustainability assessments hinge on manufacturers being committed to sustainability, not on consumer demand. "In general, I don't think consumers are clamoring for more sustainable products," he said, noting that price is a more prevalent concern. "It's up to the manufacturers and distributors to explain the long-term value in sustainable lubricants, which are premium products," and may not be a customer's first choice due to cost.

"I don't think the public is aware in the way they need to be [regarding sustainability]. As an industry, we can do a better job of educating the consumer to understand everything that goes into producing an effective and safe lubricant and how much is involved in recycling, reusing or safely disposing of that lubricant," Fitch added.

When it comes to the state of regulations and compliance regarding sustainability, Fitch acknowledged the impact of the Environmental Protection Agency on engine design and fuel consumption, which has led to lower-viscosity oils with lower polluting emissions. Yet he has seen little industrial regulation directly tied to sustainability and the environment, with the exception of disposal regulations, which vary from state to state and have no overarching federal standard.

In the absence of a federal vision, some in the industry have taken proactive measures that focus on advances in lubricant reuse, recycling and reconditioning.

"For example," Fitch said, "SKF RecondOil is marketed as a service that offers the capability to continuously regenerate oil, restoring it to a healthy state.

"Some oil customers have machines holding, in some cases, tens of thousands of gallons of oil," he explained. "The cost of changing that oil is enormous. And sometimes the only deficiencies in that oil are that a particular additive has been consumed and contaminants need to be removed.

Maybe less than 0.1% of that oil is antioxidants additive, but it's an important additive that's also one of the first additives to deplete. Once it's consumed, the typical approach is to drain the old oil and pump in new. By doing that, though, you're throwing away 99.9% of that oil that didn't need to be thrown away."

Fitch compared the situation to buying a $250,000 Maserati, running out of windshield-wiper fluid and deciding you need to buy a whole new car instead of just replenishing the fluid. "That's not very smart. And, in many situations, it's the same when it comes to oil. Customers don't need to buy a whole new batch of oil if we simply can fix what has been depleted within the oil. That doesn't work in all cases, but it does work in certain cases. There are companies out there today that are doing that, but more of it needs to be done in the future."

He believes solutions like this can lead to significant benefits for the planet and for customers alike.

Setting the Standard

To better understand where such innovations are occurring globally and what steps still need to be taken to improve sustainability, this spring and summer, the Sustainability Committee of the Union of the European Lubricants Industry (UEIL) surveyed its members about sustainability for the first time. One hundred and eighty-nine companies completed the full survey. (UEIL is expecting to have results available sometime this fall.)

According to Sustainability Committee Chair Christine Fuchs, the survey will provide UEIL with "a better understanding of where lubricant manufacturers stand on their journey toward greater sustainability, what is their experience, challenges and difficulties so far. This information will help us to better support them but also to create a benchmark to measure evolutions in the field in the coming years.

"A major challenge is to find a common understanding of the methodology for the calculation of the carbon footprint of the products — and to get reliable and comparable figures for the raw materials," Fuchs said. "Hence, one of our main objectives in our working groups is to develop a common understanding and a suitable calculation method that every company can use.

"UEIL takes a holistic approach regarding sustainability," she continued, which means considering all steps in the supply chain, starting with the carbon footprint of raw materials, the manufacturing and logistics, as well as the performance and the emissions in the application. "In addition, we strive for a circular economy, taking into account recyclability aspects of the lubricants after the applications."

The International Council for Machinery Lubrication (ICML) also has been developing and promoting benchmarks

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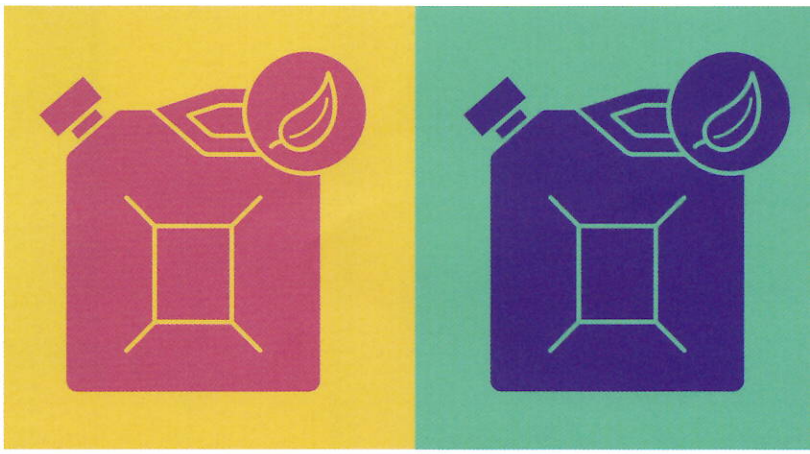

***Christine Fuchs**, UEIL Sustainability Committee Chair*

to support sustainability efforts. ICML 55 is an asset-management standard based within the context of ISO 55001, which includes a section on sustainability, the environment, carbon footprint and the balance and optimization of these things when selecting and using lubricants, Fitch said. "Written by 45 subject matter experts in the lubrication space — formulators, users, consultants, people like that — this standard identifies what's important and how we move forward in this industry. To me, it highlights a lot of things that people need to be doing to work toward sustainability."

When it comes to widespread adoption of this standard, published in 2019, Fitch said, "We've got a long way to go. We're working now to build awareness, trying to get people to understand where the opportunities are and where the gaps are between the things that are being done and the things that could be done to reach the optimum state."

Reaching the Next Generation

Gosalia believes the benefits of attaining that "optimum state" of improved sustainability will extend beyond the environmental impact. "Potential future employees are looking for an ideal mix between profit and purpose," he said. "Sustainability initiatives can support efforts to attract top talent."

In addition, he points out that many viable job candidates may currently dismiss the lubricant industry because of its perceived negative environmental impact, even though the reality is quite different. "Lubricant organizations around the world reduce more carbon dioxide with their products in the use phase than they emit during production," he said. "This is a powerful message that organizations can use to change a common misconception and to attract talent by highlighting the critical role lubricants have in the world."

Ultimately, Fuchs said, "Sustainability is not only a challenge but a huge opportunity to find solutions — through innovative ideas and new technologies — which will have a positive impact on the reduction of emissions, with the aims of bringing benefits to the climate and matching the targets set by the regulations."

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