BY GEORGE GILL

A World Going Flat?

Performance Gains Cramp Lube Demand

While growing availability of high-performance base stocks is driving a move towards higher quality lubricants, both base stock and lubricants demand are slowing worldwide, according to recent presentations by consultancy Kline & Co.

Global lubricant demand growth, including process oils, is expected to taper to 1.4 percent per year (or less) to reach 45.5 million metric tons by 2023, from 39.5 million tons in 2013, says the research firm's latest forecasts.

George Morvey, industry manager for Kline's Energy Practice, reminded during an October webinar that Shell remained the biggest global supplier of finished lubricants in 2013, followed by ExxonMobil, BP, Total, Chevron, PetroChina, Sinopec, Idemitsu, Lukoil and Fuchs. These top 10, unchanged from the year before, accounted for more than half of total lubricants supply in 2013.

Ranking 11th through 20th were JX Holdings, Petronas, Valvoline, Gulf Oil International, Pertamina, Gazpromneft, Phillips 66, Indian Oil, Hindustan Petroleum and Petrobras. Together, the top 20 global suppliers accounted for nearly two thirds of total lubricants supply.

According to Kline's findings in "Global Lubricants: Market Analysis and Assessment," Asia-Pacific is the largest lube-consuming region, with 43 percent of demand in 2013, followed by the Americas at 32 percent, Europe with 17 percent, and Africa and the Middle East with 8 percent.

"Regardless of which region or country market you're playing in, there is a movement towards higher-performance, quality lubricants, and we expect that to continue in both the developed and in the developing country markets," Morvey said.

One key factor worldwide is lubricant users striving to optimize their uptime and reduce maintenance costs, motivating them to demand higher quality products, such as synthetics. "The push by governments to reduce emissions and improve fuel economy is pushing OEMs, whether it's transportation equipment or heavy machinery, to build better, more efficient products," he said. This creates an appetite for better lubricants — and not simply for more lubricants.

The United States remains the largest lube-consuming country market, followed by China, India, Russia and Japan. Brazil, the DACH countries (Germany, Switzerland and Austria combined), South Korea, Indonesia, Canada, Mexico, the United Kingdom and Thailand round out the global top 13. Together, these "Top 13" consume 73 percent of the world's lubricants.

However, Kline expects China to surpass the United States in 2017 or 2018 as the largest single consumer of lubricants. The study next points to India, Russia and Brazil as growth engines for global lubricant demand due to their expanding industrial activity, automobile production and vehicle parc. Other growth engines in Asia-Pacific include Indonesia and Thailand.

Automotive engine oil — including oils for passenger cars and heavy-duty trucks — account for 44 percent of lubricants demand, followed by process oils at 14 percent, hydraulic fluids (9 percent), other automotive lubricants (9 percent), general industrial oils (8 percent), and industrial engine oil (7 percent). Metalworking fluids at 6 percent and grease with 3 percent make up the rest.

Passenger car motor oil demand globally is expected to grow slightly from 7 million tons in 2013 to more than 8 million tons by 2023, with SAE 5W and SAE 0W weight products accounting for about 44 percent by 2023. Kline believes the continuing global migration to lower vis-grade PCMO will result in higher penetration of synthetics and semi-synthetics, bringing higher revenues — but longer oil drain

intervals that will suppress overall volume growth. Key drivers here are OEM factory-fill choices and vehicle owners' desires for easier maintenance. "We think there are plenty of opportunities for the entire supply chain to promote synthetics in all regions and country markets," Morvey said.

In North America — including the United States, Canada and Mexico — SAE 0W-XX grade motor oils are increasing their penetration as a direct result of moves by Toyota and Honda to adopt lighter-weight oils. The region is an SAE 5W one, Morvey said, because that's the vis-grade that OEMs have recommended for quite some time now. "Consumers are comfortable with that, price points are good, and they're meeting OEM recommendations," he pointed out. "And long term, unless there's a significant shift, that will be the preferred vis-grade in North America."

In the heavy-duty motor oil segment, Kline expects demand to grow from about 9 million tons in 2013 to 10.5 million tons by 2023, with SAE 15W-40 accounting for 50 percent of the market by 2023. And while monogrades are declining, they still account for about one third of global demand. "Each year, as equipment is modernized, and better maintenance practices are followed, expect monograde to go away," Morvey said.

One exception may be Mexico, he noted, where monogrades will be more tenacious. "Mexico is the recipient of used vehicles from the U.S., and they tend to be cars 10-plus years old that find a second or third home in Mexico," he said. "U.S. vehicles back then tended to have a 10W-30 or maybe 5W-30 vis-grade appetite, which is why we see 5Ws and 10Ws increasing in that market."

An expanding consumer vehicle parc and robust new car sales in developed and developing countries are projected to drive demand for higher quality factory- and service-fill PCMO. "Regardless of where you look, people are buying more cars, and the vehicle parcs are increasing. "There is really no sign of that slowing down."

U.S. sales of new vehicles sank to 10.4 million units in 2009, but have rebounded strongly in the past two years and Kline forecasts new-vehicle sales in the United States will grow from just over 15.5 million units in 2013 to 16 million-plus in 2014, and top 17 million in 2017. Meanwhile the country's vehicle parc could swell to more than 265 million units by then.

George Morvey

Ian Moncrieff

Anuj Kumar

For automotive lubricants, driving factors include the higher availability of high-performance base stocks, such as API Group II, Group III and III+, which have worked their way into the market. "This has enabled suppliers to elevate their product portfolio, so they can compete in a product segment they may have been locked out of in the past," he said. "Certainly the availability of high-performance base stocks anywhere in the world at reasonable prices has supported the move to better quality lubricants."

At last month's ICIS Pan American Base Oils & Lubricants Conference, Ian Moncrieff, director of Kline's global energy practice, eyed a troubling aspect to these trends: "New base stock capacity is being added faster than capacity retirements, and that will continue for at least another two years," he told the meeting on Dec. 5. "Meanwhile, we're looking at a global demand growth rate of 1 percent to 2 percent a year — and probably the lower end of that."

Improvements in base stocks and lubricants, coupled with more efficient equipment and longer drain intervals, are now putting the brakes on lubricant demand growth. "Our models are very good at predicting the drivers of growth, but not so good at predicting the drivers of conservation," Moncrieff conceded. Yet the risk of low or even no growth must be faced.

Worldwide, the industry since 2011 has added three barrels of base oil capacity for every one barrel it shut down. The result is a huge overhang: about 80,000 barrels per day of excess capacity, with more

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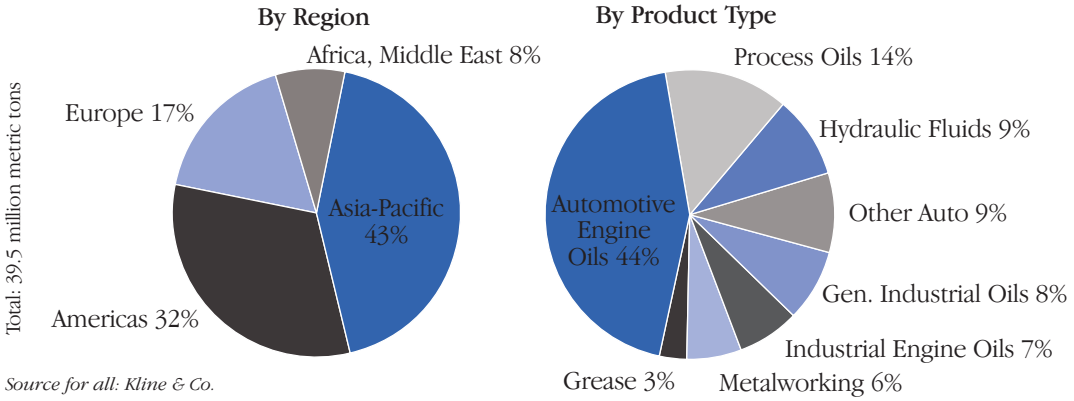
Global Lubricant Demand in 2013



Source for all: Kline & Co.

Global Lubricants' Top 10

1 Shell
2 ExxonMobil
3 BP
4 Total
5 Chevron
6 PetroChina
7 Sinopec
8 Idemitsu
9 Lukoil
10 Fuchs

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new builds on the way. "In a no-growth situation, that's an untenable position," Moncrieff stressed. "As a result, already-weak base oil refinery operating rates will remain low for the next several years."

That's pivotal because low capacity utilization rates will force out marginal base oil producers. "There's an inexorable relationship between a plant's capacity utilization and margins," Moncrieff declared. "We're in the classic business cycle of overbuilding capacity, and we're at the bottom of that cycle now."

Even were growth normal, he added, the industry would need to shut down another 80,000 b/d of base oil capacity. But growth might be flat for the next few years — "and in a no-growth market, it's possible that 50,000 b/d more will need to go."

Other Kline researchers also warn that the global base stock surplus, combined with slowed demand growth, foretells the loss of more base oil plants in the near future. Potential lubricant base stock supply (including paraffinic API Group I, II, III and naphthenics) is about 38.2 million metric tons, Anuj Kumar, a project manager in Kline's energy practice, said in another online presentation in October. The market apparently requires only 35.1 million tons of this, so some goes into non-lubricant uses such as brake fluids, cleaners,

Base Stock Drivers and Market Space

Category	Market space
Group I	Mid and bottom-tier automotive products; industrial oils and fluids; metalworking fluids; process oils; greases
Group II	Mid-tier PCMO (10W-30); mid- and top-tier HMDO (15W-40); unlicensed ATF; other automotive; select industrials (turbine, hydraulic and gear oils); process oils (white oil, transformer oil)
Naphthenic	Process oils (rubber, transformer, paints); metalworking fluids; greases; select industrial oils
Group III/III+	Top-tier PCMO (0W and 5W); top-tier HDMO (5W); factory-fill ATF; white oils and food-grade lubes; transformer oils
Polyaphaolefin (PAO)	Light-grade fuel efficient engine oils; widely cross-graded engine oils; long-life and fill-for-life auomotive gear oils and transmission fluids; high-performance industrial gear oils and stationary gas turbines
Synthetic esters	Solubility component with Group III; metalworking fluids; fire-resistant hydraulics; aviation lubes; refrigeration oils; food-grade and biodegradable lubes
Polyalkylene glycols (PAG)	Fire-resistant hydraulic fluids; biodegradable and food-grade products; compressor, refrigeration and gear oils; chain oils; metalworking

solvents and even fuel.

Nevertheless, a daunting amount of new base oil production capacity is planned for the future. Drawing boards have about 10 million t/y of new base stock capacity to be added over the next 10 years. Kline considers about 8.7 million tons of this to be "credible."

Hence, the global market should brace for closures of high-cost base oil plants, Kumar advised. "Group I is the obvious target, but naphthenic and some of these smaller Group II plants are also at risk," he noted. "As the oversupply situation continues to persist, we will see some price pressure on all grades of base stocks that are in surplus."

The global map for base oil production continues to shift, with new plants streaming in the Middle East, Asia, Europe and elsewhere, notes the Kline study "Global Lubricant Basestocks: Market Analysis and Opportunities." According to Kumar, "We can expect a certain amount of changes in trade flows, directions and quantities."

Group I's share in the total market exhibits a long-term downward trend, Kumar said, and it is under pressure from stringent technical requirements as well as the growing supply of competing base stocks such as Group II and Group III. But while Group I base oil has largely exited North American and European automotive formulations, it remains "a key base stock used to formulate automotive lubricants in markets like Asia Pacific, South America, Eastern Europe and the Africa and Middle East regions."

The industrial segment is now the mainstay application for Group I, "however, it is continuously being displaced by Group II in applications such as hydraulic fluids, turbine oils, gear oils, marine oils and railroad oils," Kumar said. (And not always successfully, he interjected: "In some applications like marine oils, the use of Group II has created problems of engine cleanliness.")

The current overcapacity situation has essentially destroyed the Group II price premium over Group I oils, he said, which further prompts formulators to switch away from Group I stocks, especially in the low- and medium-viscosity grades. A radical revamping of remaining Group I capacity may occur, he predicted, to maximize production of heavy neutrals and bright stocks.

Group II represented over one-quarter of the global base stock demand in 2013, but "given the surplus of high-performance base stocks, lubricant quality requirements no longer shape base stock demand," Kumar said. "Between 2004 and 2012, the share of Group II and III has grown from 22 percent to 40 percent, an annual growth [rate] of 9 percent."

The pain of the excess capacity could hurt for years, Moncrieff observed in New Jersey. "While overbuilding can be absorbed quickly in high-growth markets," he cautioned, "this is not the case in base oils, where the after-effects can linger for extended periods." ▮