ILMA Annual Meeting
The Evolving Business Dynamics of the Lubes Industry

A presentation at:

ILMA
Independent Lubricant Manufacturers Association

Scottsdale, AZ
18th October 2016
Kline Energy is about enabling decision making and helping craft successful strategies for companies active in the entire lubricants value chain.

**MARKET RESEARCH REPORTS**

*Readily available multi-client reports identify market opportunities and create action plans*

**MANAGEMENT CONSULTING**

*Individual client consultations address specific business issues and help implement solutions*

*Translating market intelligence into successful strategies*
How are market dynamics influencing the supply chain?
How are the margins in the value chain changing?

Characteristic U.S. Cost and Gross Margin Structure of 5W30 Synblend in 5-quart jugs in Mid-2016 ($/Gallon)

Source: Kline
Global lube demand has been essentially flat over the past 10 years, while future growth will be nominal.

Market Situation

- Global lubricant market was **39.4 MT (11.7 billion gal) in 2015** and is projected to grow at slightly less than 1%/year, reaching **42.5 MT (12.7 billion gal) by 2024**

### Global Lubricant Demand By Region 2006 - 2015

Asia-Pacific accounts for more than 40% of the total lubricant market and is the fastest growing market mainly due to the growth of end-user industries in key countries such as China and India.

*Source: Kline*
The top 10 countries represented 65% of global lubricants demand in 2015:

1. U.S. 7.79 MT
2. China 7.35 MT
3. Germany 0.93 MT
4. Japan 1.65 MT
5. Russia 1.65 MT
6. Brazil 1.30 MT
7. South Korea 0.95 MT
8. India 2.33 MT
9. Indonesia 0.89 MT
Globally, industrial oils account for 46% of the market followed by commercial (30%) and consumer (24%).

### Overview


- **Industrial**: 46%
- **Commercial**: 30%
- **Consumer**: 24%

### Global Lubricant Market

By region, By volume (in MT) 2015

<table>
<thead>
<tr>
<th>Region</th>
<th>Industrial</th>
<th>Commercial</th>
<th>Consumer</th>
<th>Total (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South America</td>
<td>1.1</td>
<td>1.0</td>
<td>0.9</td>
<td>3.0</td>
</tr>
<tr>
<td>Africa &amp; ME</td>
<td>0.9</td>
<td>1.5</td>
<td>0.9</td>
<td>3.3</td>
</tr>
<tr>
<td>Europe</td>
<td>3.5</td>
<td>1.7</td>
<td>1.4</td>
<td>6.6</td>
</tr>
<tr>
<td>North America</td>
<td>4.3</td>
<td>2.3</td>
<td>2.7</td>
<td>9.3</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>8.1</td>
<td>5.3</td>
<td>3.8</td>
<td>17.2</td>
</tr>
</tbody>
</table>

**Source:** Kline
Automotive: Global PCMO demand is forecast to grow from 9.6 MT in 2015 to 10.5 MT by 2024, with SAE OWs and 5Ws combined reaching about 45% of the total.

The global migration to lower viscosity multigrade PCMOs will result in higher penetration of synthetics and semi-synthetics.

Source: Kline
PCMO visgrade composition varies significantly by region, with 0/5W penetration still very low outside the OECD.
Global demand for HDMO is forecast to grow from 11.8 MT in 2015 to 13.0 MT by 2024

Most encouraging for increased synthetic penetration is the shift from monograde to multigrade and, within multigrade, from heavier visgrades like 20/25Ws to lighter grades (15Ws and 10Ws).
Lower visgrade and monograde HDMO demand also varies significantly by region
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GLOBAL LUBRICANT DEMAND

NORTH AMERICA LUBRICANT DEMAND

UNITED STATES SUPPLY CHAIN DYNAMICS

BASE OIL SUPPLY

SYNTHETIC LUBE DEVELOPMENTS

DISTRIBUTION EVOLUTION

OTHER INFLUENCES
North American lube demand is expected to remain stable over the next 10 years

Overview

- The 2015 lubricant market was approximately 9.3 MT or $32 billion

Demand may be flat but there are interesting dynamics within that volume

**Demand Pattern Historic 2006 – 2015**

<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th>Canada</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>9.5</td>
<td>11.0</td>
<td>0.8</td>
</tr>
<tr>
<td>2007</td>
<td>9.3</td>
<td>10.9</td>
<td>0.8</td>
</tr>
<tr>
<td>2008</td>
<td>8.6</td>
<td>10.1</td>
<td>0.8</td>
</tr>
<tr>
<td>2009</td>
<td>7.6</td>
<td>9.0</td>
<td>0.8</td>
</tr>
<tr>
<td>2010</td>
<td>7.6</td>
<td>9.1</td>
<td>0.7</td>
</tr>
<tr>
<td>2011</td>
<td>7.7</td>
<td>9.2</td>
<td>0.7</td>
</tr>
<tr>
<td>2012</td>
<td>7.7</td>
<td>9.3</td>
<td>0.7</td>
</tr>
<tr>
<td>2013</td>
<td>7.8</td>
<td>9.3</td>
<td>0.7</td>
</tr>
<tr>
<td>2014</td>
<td>7.8</td>
<td>9.3</td>
<td>0.7</td>
</tr>
<tr>
<td>2015</td>
<td>7.8</td>
<td>9.3</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**Demand Forecast 2016 – 2024**

<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th>Canada</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>9.3</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>2018</td>
<td>9.3</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>2020</td>
<td>9.3</td>
<td>0.7</td>
<td>0.8</td>
</tr>
<tr>
<td>2022</td>
<td>9.4</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>2024</td>
<td>9.4</td>
<td>0.8</td>
<td>0.8</td>
</tr>
</tbody>
</table>

**Volume in MT**

*Source: Kline*
Lube segments remain stable within the overall flat N. American lube market

Demand Pattern Historic 2006 – 2015
By Market segment, By volume (in MT)


Source: Kline
The U.S. industrial segment leads on volume, but engine oils lead in value

### Volume Share by Product Segment

- **Industrial**: 48%
- **Commercial**: 24%
- **Consumer**: 29%

### Value Share by Product Segment

- **Industrial**: 40%
- **Commercial**: 22%
- **Consumer**: 38%

#### Product Share of Total Volume and Value

<table>
<thead>
<tr>
<th>Product</th>
<th>% of Total Volume</th>
<th>% of Total Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine oils</td>
<td>51</td>
<td>57</td>
</tr>
<tr>
<td>Process oils</td>
<td>17</td>
<td>15</td>
</tr>
<tr>
<td>General industrial oils*</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Transmission fluids</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Metalworking fluids</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>All other fluids</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

- The industrial market segment consumes the largest volume of lubricants, accounting for an estimated 3.7 MT, valued at $10.9 billion.
- Use of lubricants by the consumer automotive segment was 1.8 MT, valued at $10.4 billion.
- The commercial automotive segment is third in both volume and value.

*Includes hydraulic fluid, industrial gear oil, turbine and circulating oil, compressor and refrigeration fluid, heat transfer fluid, and other general industrial oils.
Automotive: Overall U.S. volumes of PCMO and HDMO are remaining relatively flat through 2024, but the lower viscosity grades are growing.

**PCMO**
- 2015: 2.24 MT
- 2019: 2.17 MT
- 2024: 2.13 MT

**HDMO**
- 2015: 1.83 MT
- 2019: 1.86 MT
- 2024: 1.88 MT

Source: Kline
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  - SYNTHETIC LUBE DEVELOPMENTS
  - DISTRIBUTION EVOLUTION
  - OTHER INFLUENCES
How are market dynamics influencing the supply chain?

Base Stock Producers
- Package Suppliers
- Additive Component Suppliers

Direct:
- National Oil Companies
- Non-Integrated Blenders

Distributors:
- Major Blenders
- Non-Integrated Blenders

Direct Distributors:
- Customers

Finished Lubricant Value Chain
- Internet of things
- Nature of relationship
- Balance of power
- Role of the OEM

Investors

Value Margin
ILMA manufacturers and marketers account for approximately 70% of the U.S. industrial market and 35% of the automotive market

Within automotive lubricants, seven marketers account for ≈65% of the market, while ≈50 marketers compete for the other 35%

Meanwhile, industrial lubricant applications are more fragmented, allowing more opportunities for differentiation, with nearly 100 active ILMAs

<table>
<thead>
<tr>
<th>Majors</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExxonMobil</td>
</tr>
<tr>
<td>Shell</td>
</tr>
<tr>
<td>BP/Castrol</td>
</tr>
<tr>
<td>Chevron</td>
</tr>
<tr>
<td>P66</td>
</tr>
<tr>
<td>Valvoline</td>
</tr>
<tr>
<td>CITGO</td>
</tr>
</tbody>
</table>
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- Global Lubricant Demand
- North America Lubricant Demand
- United States Supply Chain Dynamics
  - Base Oil Supply
  - Synthetic Lube Developments
  - Distribution Evolution
  - Other Influences
More than 2 barrels of Group II/III base oil capacity are being added worldwide for every barrel of announced Group I capacity retirements.


Some 120 KB/D of Group I capacity has been decommissioned from 2010 through 2016, but a further 100 KB/D is “At Risk” from low margins in the future.

Source: Kline
Though most of the global new construction boom is now on-stream, sluggish lube demand growth forecasts suggest a slow recovery in base oil plant operating rates.

Global Base Oil Effective Capacity Utilization

*Global Caputil*

- 2% CAGR Lube Demand Growth
- 1% CAGR Lube Demand Growth
- No Lube Demand Growth

*Effective Capacity is Nominal Calendar Day Average (Nameplate Capacity x Group-weighted Stream Factor)*

*Source: Kline*
With low crude prices and weak base oil margins, the downstream lubricants business will continue to enjoy above-average profitability...

...illustrated by an analysis of Valvoline’s quarterly financials
Key takeaways from the base oil analysis...

**Crude Oil Prices**
- Crude oil prices are both unpredictable and volatile
- The current Brent forward strip for end-2020 is $60/Bbl
- DOE’s September 2016 Annual Energy Outlook projects Brent at nearly $85/Bbl in 2020....the basis differential vs. the forward strip suggests a hedging program is likely to be profitable

**Base Oil Prices**
- Higher crude prices mean higher base oil prices
- Continuing overcapacity will continue to depress base oil cash margins
- Low-viscosity stocks vulnerable to price weakness,
- Net result is that lube blenders are likely to have to absorb only increases in crude oil prices, as base oil margins over crude remain depressed and competition between suppliers get even tougher

**Finished Lube Prices**
- These are affected by changing consumption patterns and channels (the decline of fast lubes?)
- Weakness in upstream costs and margins suggests a continuing favorable COGS environment for blenders and marketers, barring a major oil catastrophe
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  - DISTRIBUTION EVOLUTION
  - OTHER INFLUENCES
Demand for high performance, quality lubricants is expected to accelerate in both developed and developing countries.

**SUPPLY PUSH**
- Abundant high performance basestocks
  - (Group II, III, now III+)

**DEMAND PULL**
- Increased use of higher quality level lubricants in automotive applications
- Increased use of industrial lubes with better AO, AW, and EP performance

OEM technical demand

Environmental/regulatory

Operating cost optimization
OEM technical demand from volume/mass market OEMs is rapidly changing the factory and service fill landscape, creating opportunities for lubricant suppliers to sell synthetics.

U.S. Production (Factory fill)

- Corvette: 1.6 KT
- Camry: 2.1 KT
- Accord: 3.7 KT

U.S. Sales (Service fill)

- Corvette: 3.3 KT
- Camry: 3.7 KT
- Accord: 3.3 KT

Source: Kline
However, the synthetic PCMO space is no longer the domain of the global majors

<table>
<thead>
<tr>
<th>Supplier</th>
<th>Synthetic</th>
<th>Premium-Synthetic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“BIG 3”</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shell</td>
<td>Pennzoil Platinum</td>
<td>Pennzoil Ultra Platinum</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>Mobil Super Synthetic</td>
<td>Mobil 1 EP</td>
</tr>
<tr>
<td>BP</td>
<td>Castrol Magnatec</td>
<td>Castrol Edge</td>
</tr>
<tr>
<td>Calumet</td>
<td>Royal Purple Synthetic</td>
<td>Royal Purple HPS</td>
</tr>
<tr>
<td>Amsoil</td>
<td>XL Extended Life Synthetic</td>
<td>Signature Series Synthetic</td>
</tr>
<tr>
<td>Total</td>
<td>Active Synthetic</td>
<td>Quartz Synthetic</td>
</tr>
<tr>
<td>Fuchs</td>
<td>Titan Super Syn</td>
<td>Titan Super Syn Longlife</td>
</tr>
<tr>
<td>GS Caltex</td>
<td>KIXX New, G1, Gold SL</td>
<td>KIXX PAO, PAO 1</td>
</tr>
<tr>
<td>Liqui Moly</td>
<td>Molygen</td>
<td>Synthoil Energy</td>
</tr>
<tr>
<td>Valvoline</td>
<td>SynPower</td>
<td>-</td>
</tr>
<tr>
<td>Shell</td>
<td>QS Ultimate Durability</td>
<td>-</td>
</tr>
<tr>
<td>Phillips 66</td>
<td>Kendall GT-1 Full Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>Chevron</td>
<td>Havoline Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>Indian Oil</td>
<td>Servo Futura Synth</td>
<td>-</td>
</tr>
<tr>
<td>Sinopec</td>
<td>Sinopec SM Engine Oil</td>
<td>-</td>
</tr>
<tr>
<td>PetroChina</td>
<td>KunLun Tianyuan</td>
<td>-</td>
</tr>
<tr>
<td><strong>NOCs</strong></td>
<td></td>
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<tr>
<td><strong>OEM-GPO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ford</td>
<td>Motorcraft Full Synthetic (s/s)</td>
<td>-</td>
</tr>
<tr>
<td>Toyota</td>
<td>Toyota Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>Honda</td>
<td>Honda Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>Subaru</td>
<td>Subaru Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>Chrysler/Fiat</td>
<td>Mopar Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>General Motors</td>
<td>dexos 1 (s/s)</td>
<td>-</td>
</tr>
<tr>
<td><strong>RETAIL</strong></td>
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<tr>
<td>NAPA</td>
<td>NAPA Synthetic</td>
<td>-</td>
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<tr>
<td>Walmart</td>
<td>SuperTech Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>O’Reilly Auto Parts</td>
<td>O’Reilly Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>Advance Auto Parts</td>
<td>Advance Synthetic</td>
<td>-</td>
</tr>
<tr>
<td>RelaDyne</td>
<td>DuraMAX Synthetic (s/s)</td>
<td>-</td>
</tr>
<tr>
<td><strong>DISTRIBUTOR</strong></td>
<td></td>
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</tr>
</tbody>
</table>
The difference in market pricing of the retail synthetic PCMO products can be linked to the base fluids used, driven by their formulation properties and brand positioning.
Almost 50% of U.S. blended lubricants are sold directly to the end user

U.S. Lubes Distribution

- Direct: 47%
- Distributors: 45%
- Auto Parts Stores: 4%
- Mass Merchandisers: 4%

Industrial lubricants

- 4 key categories: major oil companies, large specialty manufacturers, small specialty firms, and distributors
- Generally process oils, industrial engine oils, and metalworking fluids tend to be marketed directly to the end user

Consumer automotive lubricants

- Lubricants sold through direct channels accounts for an estimated 30%
- Distributor sales 42%
- Mass merchandisers 13%
- Auto parts stores 14%

Commercial automotive lubricants

- Sales through distributors and jobbers account for an estimated 67% of total sales
- Direct sales accounts for only 33% of the total sales
Distributor M&A consolidation is best illustrated by PetroChoice, Reladyne and Brenntag, which have grown to control a significant amount of lube distribution in the U.S.

<table>
<thead>
<tr>
<th>Company</th>
<th>Key Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>PetroChoice</td>
<td>Acquired from Greenbriar Equity by Golden Gate Capital in December 2015</td>
</tr>
<tr>
<td></td>
<td>Acquires Universal Lubricants in May 2016</td>
</tr>
<tr>
<td>Brenntag</td>
<td>Acquires GH Berlin-Windward and J.A.M. Distributing in November 2015</td>
</tr>
<tr>
<td></td>
<td>Acquires lubes division of NOCO Distribution in October 2016</td>
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<tr>
<td>RelaDyne</td>
<td>AEA Investors LP sold to Audax PE in July 2016</td>
</tr>
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<td></td>
<td>Acquires Parker Oil, Hollingsworth Oil, and Cardwell Distributing in 2016</td>
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</tbody>
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Brenntag
- Acquires GH Berlin-Windward and J.A.M. Distributing in November 2015
- Acquires lubes division of NOCO Distribution in October 2016

~500-600 KT Branded + Private Label
These leading distributors employ a multi-brand strategy to supply the automotive and industrial customer base in their respective sales territories.
Few U.S. distributors have partnered with the PE world or embarked on aggressive M&A activities, with many operating as independent regional businesses...but for how long?

- Valvoline
- Phillips 66
- Total
- Safety Kleen
- ServicePro

- Circle Lubricants
- PrimeLube
- Grade A Petroleum
- MetroLube
- Yoder Oil Company
- PPC Lubricants
- PWD Lubricants
- Lyden Oil Company

- All follow a multi-brand strategy
- Some with private label
- Some with ILMAs in the value position

- CITGO
- Ford/Motorcraft
- Gulf Oil
- Phillips 66
- Lubriplate/Fiske
- Blue Star
- ProGuard (PL)

- Valvoline
- ExxonMobil
- Petro-Canada
- Safety-Kleen
- Super Clean (PL)

- Phillips 66
- BP
- CAM2
- Bio Blend

- Phillips 66
- BP
- Total
- Safety Kleen
- ServicePro

- Bio Blend
- Commonwealth
- Argus
-contreX
- Motorcraft
- Ford
- Mobil
- Shell
- BP
- ENI
- Safety-Kleen
- Warren Dist.
Lube distributors (large and small) afford lube manufacturers supply coverage across a wide swath of territory, along with many other efficiencies...

- How do you change their mind set and move them to a branded offering?
- Have market development and customer perceptions narrowed/eliminated the advantage that branded has long enjoyed?
- How knowledgeable and enthusiastic can the sales rep be about all aspects of your product and service offerings if he/she also has to be equally competent on the other two to five brands?
...but does your brand have the consumer loyalty, awareness, and equity that translates into sufficient pull-through for the distributor?

- Multiple warehouse points across multiple states, means lube manufacturers can be confident that its national account business will be reliably served and represented and poised for growth.

- National account business has evolved into a strong hook for both parties.

- If you are skewed more towards national accounts, you should not be surprised if your brand ranks lower on the distributor pecking order compared to your competition.
Advancements in technology will have a large impact in the industry in the future

What does digital mean for the lube industry now and going forward?

- How will the essence of lubrication evolve based on the future of end-use industries in the context of “digital”?
- What is the impact of digital on the key consuming industries and, as a result, on the lube value chain?
- Who will be choosing, purchasing and using the lubes, and what the decision making process be like?
- Who will need to be targeted to sell lubes? (buyers and influencers)
- How can lube companies (1) build relationships and influence decision makers? (2) compete effectively?
- How will marketing (in its broad sense), communication and sales need to evolve?
In Summary…

- Overall lubricant volume is growing marginally
- Lower visgrades are growing significantly more, but higher grades are diminishing
- Portfolio management is key to ensure it is resilient enough
- Margins are good for finished blenders right now
- Distributor strategy is key, but may be somewhat unpredictable based on consolidation and acquisition outside of your control
- Looking to the future, technology developments need to be considered with the OEM taking a bigger role in the industry supply chain
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