Trends in the Lubricants Business:
Managing challenges and finding opportunities in a low growth environment

A presentation for:

THE ILMA Management Forum
“Quality, Integrity, Stewardship”

April 2018
Time to reflect quickly on the past 6 months...

ILMA
Independent Lubricant Manufacturers Association

ILMA 2017 Annual Meeting

Shifting Gears – Innovating the Future
How are market dynamics influencing the supply chain?

- **Base Stock Producers**
  - Direct
  - Distributors
- **Additive Component Suppliers**
  - Direct
  - Distributors
- **National Oil Companies**
  - Direct
  - Distributors
- **Non-Integrated Blenders**
- **Major Blenders**
- **Direct Distributors**
- **Non-Integrated Blenders**
- **Major Blenders**
- **Direct Distributors**
- **Customers:**
  - Industrial
  - Consumer
  - Commercial

**Value Chain**

- **Balance of power**
- **Role of the OEM**
- **Digitization/IOT**
- **Nature of relationship**
- **Investors M&A**
- **Value Margin**
Global lubricant demand has been essentially flat over the past 25 years...

Global Lubricants Demand, 1990-2016

(Million Tons)

Note: Estimates are average of 3 quoted sources, adjusted to common basis, including marine lubes and excluding aromatic extracts used as RPOs.

Sources: Kline, Fuchs Petrolub, SBA Consulting
....with a demand elasticity of -3.5% versus real GDP growth

Year-to-year Changes in World Lubricant Consumption vs. World Real GDP Growth, 1990-2016

Sources: IMF, Kline, Fuchs Petrolub, SBA Consulting
If past real GDP/lubricant demand growth elasticities don’t change, increased demand in developing Asia offsets declines in the ROW, with the overall outlook for no (or nominal), growth

IMF’s Real GDP Growth Forecast, 2016 – 2022
(%/Year)

Source: IMF (Global Economic Forum, October, 2017)
And then there are the game-changers, most influentially vehicle electrification.

The Transition from Horses to Vehicles in the U.S. (Number per Household)

- Horses
- Vehicles
M&A: Opportunity and Disruption

- Market fundamentals
- End Use Customer
- Digitalization
- What does it all mean?
M&A activity continues and means your competitors are constantly changing

Transaction multiples of MWF and industrial lubricant marketing have averaged 9.1x EBITDA and 10.7x Free Cash Flow in the past 15 years
Market fundamentals

M&A: Opportunity and Disruption

End Use Customer

Digitalization

What does it all mean?
Volumetric growth of the global demand for industrial lubricants has been very modest. Process oil, Hydraulic fluids, Industrial engine oils and MWF are biggest segments.

Historic Global Finished Lubricant Demand Growth by Sector (CAGR 2011-2016)

<table>
<thead>
<tr>
<th>Sector</th>
<th>2011-2016 CAGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>1.2%</td>
</tr>
<tr>
<td>Commercial</td>
<td>0.0%</td>
</tr>
<tr>
<td>Consumer</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

Global Industrial Lubricant Demand = 46% of the total market

Global Industrial Finished Lubricant and Process Oil Demand by Product Category, 2017

- Process Oils
- Hydraulic Fluids
- Industrial Engine Oils
- Metalworking Fluids
- Industrial Grease
- Other General Industrial Oils*

*Other General industrial oils include: Industrial gear oil, Turbine & circulating oils, Compressor fluid, Refrigeration oil, Other Industrial Oils and Fluids
For the top 13 lubricant markets the Industrial volume growth outlook does not exceed 2%

Lubricant Demand Growth Rates For The Global “Top 13” Country Markets, 2016 to 2021

Global Industrial Lubricant Demand Outlook Under 1% CAGR

Global share (total), 2016

- United States: 21%
- China: 18%
- India: 6%
- Russia: 4%
- Japan: 4%
- Brazil: 3%
- DACH: 3%
- South Korea: 2%
- Indonesia: 2%
- Canada: 2%
- Mexico: 2%
- United Kingdom: 2%
- Thailand: 2%

= 70%
Pockets of higher value and product-related opportunities exist within some industrial segments – a granular view is required to define and capture those opportunities.

**Global Synthetic and Semi-synthetic Penetration for Industrial Oils and Fluids**

- Space for growth exists within niches: e.g. synthetics, bio-lubricants, specialty greases
  - Bio-lubes are only 1% of total but expected to grow at 5% CAGR (5Y)
- Value-driven opportunities vary by market due to:
  - Economic outlook
  - Degree of impact of broader societal/technological trends
  - Profile of the underlying industrial demand
  - Regulatory/compliance pressures
  - Available product formulation options

**Abbreviations:**
- RO: Refrigeration oil
- MWF: Metalworking fluids
- GO: Industrial Gear oil
- TCO: Turbine & circulating oils
- HF: Hydraulic fluids
- IEO: Industrial Engine oil

*Source: Kline*
To find and realize opportunities it is vital to examine deeper product/application links

Important to consider the product category demand within each End Use... as well as the cost and requirements to serve

<table>
<thead>
<tr>
<th>Industry</th>
<th>End Use</th>
<th>PO</th>
<th>GiO</th>
<th>IEO</th>
<th>MWF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td>Printing</td>
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<td>Rubber</td>
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<td></td>
<td>Chemicals and allied products</td>
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<td>Energy</td>
<td>Electrical and Energy Transmission</td>
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<td>O&amp;G Extraction and Refining</td>
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<tr>
<td>Natural Resources</td>
<td>Mining</td>
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<td></td>
<td>Wood and Paper Products</td>
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<tr>
<td>Heavy/ General Manufacturing</td>
<td>Primary Metals</td>
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<td>Fabricated Metals</td>
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<td></td>
<td>Machinery</td>
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<tr>
<td>Transportation</td>
<td>Transportation Equipment</td>
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<td></td>
<td>Off-Highway Transportation</td>
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<td></td>
<td>Marine Transport</td>
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<tr>
<td>Consumer Focused</td>
<td>Agriculture, forestry, fishing</td>
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<td></td>
<td>Food Processing</td>
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<td>Textiles</td>
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Source: Kline

Very Low

Very High
While there is a wide range of known factors influencing industrial lubricants, we should also consider “known unknowns”, and reflect on possible impact scenarios.

**High Potential Impact on Industrial Lubes**

- MARPOL VI
- Chlorinated Paraffins
- Tire Process Oils
- China Rationalization

**Guaranteed to Happen**

- CAFE Standards
- Pro-O&G DOE/DOI in the US

**Hard to Assess Impact**

**Known Unknowns =**

High potential impact, but also highly uncertain outcomes or timing of impact

**Selected Examples:**

- Mobility E/(R)evolution
- Additive Manufacturing
- Digital Transformation
Market fundamentals

M&A: Opportunity and Disruption

End Use Customer

Digitalization

What does it all mean?
Digital Transformation has many interconnected facets: IIoT, Industry 4.0, Digital Marketing

What does it mean for Industrial lubricant MARKETING?

**ENGAGEMENT MARKETING:**
- Sales teams engage buyers while they research
- Sales/marketing alignment
- Connecting insight, R&D, communication, processes, and sales
- Build tangible evidence base for “why choose us”

What does it mean for Industrial lubricant APPLICATION?

**PREDICTIVE MAINTENANCE:**
- Real time condition monitoring, digital twins
- New stakeholders: sensors, software and systems providers
- New skills: people comfortable with technology and analytics (in-plant and in the “cloud”)

What does it mean for Industrial lubricant SUPPLY CHAIN?

**E Volving SUPPLY CHAIN:**
- Changes in decision-making processes, stakeholders and system configuration
- Powerful early adopters are promoting change up and down the value chain

Source: Kline analysis, Cisco
Tracking the broader view of the value chain allows to spot disruptions and longer-term influences => this enables the shift from reactive to proactive planning.

Assess the influence of industry on demand for lubricant categories

<table>
<thead>
<tr>
<th></th>
<th>Chemicals</th>
<th>Energy</th>
<th>Natural Resources</th>
<th>Heavy/GenMan</th>
<th>Transportation</th>
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<tbody>
<tr>
<td>PO</td>
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<td><img src="https://via.placeholder.com/150" alt="Diagram" /></td>
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<tr>
<td>GIO</td>
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<tr>
<td>MWF</td>
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Track the source of change and/or disruption: Example of Additive Manufacturing (3D Printing)
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<table>
<thead>
<tr>
<th>Target user</th>
<th>Consumer</th>
<th>Small to mid-sized business</th>
<th>Corporations</th>
</tr>
</thead>
<tbody>
<tr>
<td>In need of further R&amp;D</td>
<td></td>
<td>• Organ Replacement, $30B</td>
<td>• Furniture, $20B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Consumer electronics, $289B</td>
<td></td>
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<tr>
<td>Nearing commercial use</td>
<td>• US Prepared food, $23B</td>
<td>• Bicycles, $6B</td>
<td>• Life sciences R&amp;D, $148B</td>
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<td></td>
<td></td>
<td>• Guns and ammo, $11B</td>
<td>• Home building and improvement, $678B</td>
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<td>• Global apparel, $1T</td>
<td>• Power tools, $22B</td>
</tr>
<tr>
<td>In use</td>
<td>• Craft and hobby, $30B</td>
<td>• Medical prosthetics, $17.5B</td>
<td>• Industrial R&amp;D (for Prototyping), $23B</td>
</tr>
<tr>
<td></td>
<td>• Animation and gaming, $122B</td>
<td>• Retail hardware, $22B</td>
<td>• Aircraft and defense R&amp;D, $9B</td>
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<td></td>
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<td>• US Auto parts stores, $40B</td>
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<td>• Toys, $80B</td>
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</tbody>
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Source: Kline analysis based on Deloitte and Forbes data
Example: Mobility evolution incl. ride sharing, electrification, autonomous vehicles => impact on lubricants comes from multiple angles

**Value Chain Shifts**

- Changes in value chain influencers
- Changes in value distribution within the chain
- Changes in locations of OEMs and suppliers
- Changes in supply chain configuration
- Changes in who the customers are
- Changes in routes to market

**Process Shifts**

- Changes in car design: electronic vs mechanical
- Changes in production volumes/components
- Changes in material types
- Changes in machining/production methods
- Changes in tools and processes
- Changes in lubrication methods and products

*Specific impact on lubes: MWF, GIO*
Impact assessment example: Auto component suppliers are evaluating these broader trends in the context of impact on their business

**Disruptiveness assessment of major automotive trends on suppliers by component group**

<table>
<thead>
<tr>
<th>Component Group</th>
<th>Electrification</th>
<th>Connectivity</th>
<th>Autonomous driving</th>
<th>Advanced manufacturing</th>
<th>Advanced materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior</td>
<td></td>
<td></td>
<td></td>
<td>3D printing</td>
<td></td>
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<tr>
<td>Exterior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lightweight materials</td>
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<td>Chassis</td>
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<tr>
<td>Powertrain</td>
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<tr>
<td>E&amp;E</td>
<td></td>
<td></td>
<td></td>
<td>Full computer control</td>
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</tr>
</tbody>
</table>

Source: Kline analysis based on CLEPA and McKinsey
M&A: Opportunity and Disruption
End Use Customer
Digitalization
What does it all mean?
To conclude: Bringing it all together – key takeaways for your strategy process

- Think beyond medium term and beyond our industry’s boundaries to evaluate the nature of disruption and opportunities:
  - New stakeholders => potentially, new value chain
  - New processes
  - Technology as both enabler and disruptor

- Make those your own – translate the megatrends into the context of your own business:
  - What is my business going to be about: lubrication, fluid management or something broader like reliability?
  - How will my customers, suppliers and influencers be impacted?
  - How will my business model be impacted?
  - Will my competitive advantage be still relevant? Can I clearly articulate it?

- Translate insights into readiness through short/medium and longer term actions:
  - Focus on high impact scenarios to inform the investment of time and resources
  - Assess the required capabilities to grow, and steps to change/transform
  - Choose when to react and when to be proactive

“I would rather have questions that can't be answered than answers that can't be questioned.” Richard Feynman
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