Data, Digitalization, Decarbonization – Do Disruptions Damage Durability?

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Data, Digitalization, Decarbonization
– Do Disruptions Damage Durability

01 | Data

02 | Digitalization

03 | Decarbonization
Data
Development Global Lubricants Demand*

*Million Tons / Without Marine Oils
Data
Development Regional Lubricants Breakdown

**Demand (Million Tons)**

- Asia-Pacific & MEA
- Americas
- Europe

<table>
<thead>
<tr>
<th>Region</th>
<th>2007</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia-Pacific</td>
<td>35.9</td>
<td>36.1</td>
</tr>
<tr>
<td>Americas</td>
<td>32%</td>
<td>27%</td>
</tr>
<tr>
<td>Europe</td>
<td>45%</td>
<td>54%</td>
</tr>
</tbody>
</table>

*Demand (Million Tons)*

- 2007: 35.9 Million Tons
- 2017: 36.1 Million Tons

*Without Marine Oils*
### Data

#### Development Regional Lubricants Demand

<table>
<thead>
<tr>
<th>Region</th>
<th>2017 : 2016 Variance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>0.0</td>
</tr>
<tr>
<td>Latin America</td>
<td>-2.0</td>
</tr>
<tr>
<td>Western Europe</td>
<td>1.5</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>0.5</td>
</tr>
<tr>
<td>Middle East</td>
<td>-0.5</td>
</tr>
<tr>
<td>Africa</td>
<td>-3.0</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>3.0</td>
</tr>
<tr>
<td>World</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*Rounded Up/Down*
Data

Ranking Top 20 Lubricant Countries*

*Thousand Tons
Data
Development European Lubricants Breakdown

Demand (Million Tons)*

- Western Europe
- Eastern Europe

<table>
<thead>
<tr>
<th>Year</th>
<th>Western Europe</th>
<th>Eastern Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>6.8</td>
<td></td>
</tr>
</tbody>
</table>

- Russia: 18% (19%)
- Germany: 14% (13%)
- UK: 10% (10%)
- France: 8% (9%)
- Other Western Europe: 23% (25%)
- Other Eastern Europe: 18% (16%)
- Ukraine: 5% (5%)
- Poland: 4% (3%)

*Without Marine Oils
Data

UEIL Industry Statistics Committee

Country Data Collection Categories

The coloured categories indicate the allocation of these categories to the summaries on the country pages. Blue is Automotive; green is Industrial; other. Some countries do not report exactly in line with these categorisations. Where necessary Europalub has made editorial judgements.

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Engine Oils</td>
<td>1 A: Gasoline or diesel engine oils for passenger cars 1 A1: First fill gasoline or diesel engine oils for passenger cars 1 B: Diesel engine oils for commercial and industrial vehicles 1 B1: First fill diesel engine oils for commercial and industrial vehicles 1 B2: Multipurpose diesel oils used in farm tractors and construction 1 C: Two-stroke engine oils 1 D: Other engine oils (including aviation engine oils)</td>
</tr>
<tr>
<td>2) Gear Oils and Transmissions</td>
<td>2 A: Automatic transmission fluids (ATF) 2 B: Automotive gear oils 2 C: Industrial gear oils 2 D1: Hydraulic and transmission oils (including fire-resistant fluids)</td>
</tr>
<tr>
<td>3) Greases</td>
<td>3 A1: Automotive greases 3 A2: Industrial greases</td>
</tr>
<tr>
<td>4) Metalworking Oils</td>
<td>4 A: Quenching oils 4 B: Neat oils for metalworking 4 C: Soluble oils for metalworking 4 D: Rust prevention products</td>
</tr>
<tr>
<td>5) Highly Refined Oils</td>
<td>5 A: Turbine oils (excluding aviation applications) 5 B: Electrical oils used in transformers (including cable oils)</td>
</tr>
<tr>
<td>6) Other Oils</td>
<td>6 A: Compressor oils 6 B: General machine lubricants 6 C: Other industrial oils for non-lubricating purposes</td>
</tr>
</tbody>
</table>
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01  • Data

02  • Digitalization

03  • Decarbonization
Digitization
Digit(al)ization

- Automation of existing manual or paper-based processes …
- … enabled by the change of information …
- … from an analogous to a digital format

Digitalization

- Use of digitized technologies and digitized data for
  - generating revenue
  - improving, replacing and/or transforming processes
  - creating an environment to make digital business practices more effective
There is no Digitalization without Digitization!

- Automation of existing manual or paper-based processes …
  - … enabled by the change of information …
  - … from an analogous to a digital format

- Use of digitized technologies and digitized data for
  - generating revenue
  - improving, replacing and/or transforming processes
  - creating an environment to make digital business practices more effective
• Data collection throughout the whole value-chain will be widened compared to today's standards

• Direct and automated usage of information generated at a later step of the process will affect all steps before

• An extended exchange in between customer and lubricants company will allow for new services and therewith add extra value to business
Transform product development from being empirically-driven to using data and simulation approaches.

In doing so, application related information such as field data or test field results serve as a statistical backbone.

A more focused development will be granted by implementing the later application into product development by introducing simulation approaches into R&D.
Digitalization
Lubricant Value Creation

➢ Turn exclusively empirical evidence driven product development into a digitally supported product development
➢ Apply simulation approaches and design of Experiments (DoE)

➢ Use data to predict future sales
➢ Introduce E-Commerce Tools

➢ Monitor fluids’ life and incorporate this information into e.g. product development

Product Development ➢ Use data to enhance the production of lubricants
➢ Use simulation to optimize the location of production

Production ➢ Introduce Track & Trace of Deliveries

Sales

Distribution

After-Sales Services
Digitalization
Drivers

- Predictive Maintenance
- Track & Trace Delivery
- Big & Smart Data
- Data Usage & Analytics
- Sensor Technology Development
- Digital Business
- Model Innovation
- Design of Experiments
- Cyber Physical System
- Simulation/Modelling
- Condition Monitoring
Digitalization

Disruptors
Digitalization

Today

Our today’s ecosystem

• We do the development
• We are the owner of the know how
• We are the lubricants experts
Digitalization
Tomorrow

Supporting platforms
- Enhance communication with customers
- Bring a wider view
- Make Blender more visible

...might get supported
Digitalization

Threat

...might get disrupted

Suppliers

Blender

Customer

Information / Design
Product

3rd Party

Data
Fluid Design
Product

some kind 3rd party comes into play

- It is not the customer any more who does the specification
- Business becomes data driven
- We are being pushed towards toll blending
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Decarbonization
Corporate Carbon Footprint*

(in kilogramm CO₂e per ton produced)

- **Scope 1:** Direct emissions through own energy generation
- **Scope 2:** Indirect emissions through purchased energy
- **Scope 3:** Indirect emissions along the value chain

*FUCHS Production Locations 2014
Decarbonization
CO₂-Distribution Combustion Engine

Source: BMW / Status 2015
Decarbonization
CO₂-Distribution E-Mobility

Forecast of the effects of transitioning towards electromobility

Source: BMW / Status 2015
The topic of sustainability is becoming increasingly important. In cooperation with suppliers and customers, FUCHS is working to quantify the term sustainability. The objective is to develop a benchmark that allows our products to be assigned to categories. From this we derive tasks for research and development. We expect the change from qualitative to quantitative assessment of sustainability to bring significant progress. Sustainability will be included in the specifications for lubricants in the future.
Decarbonization
Sustainability Initiative

- In 2016, the sustainability initiative NaSch* was established as a working group in Germany

- **Members:** AVIA BANTLEON, FUCHS, ROWE, KLÜBER LUBRICATION, ZELLER+GMELIN, German Lube/Oil Associations VSI & UNITI

- **Objective:** Establish sustainability **standards, KPIs, benchmarks** for the lubricants industry and emphasize its value for society (image campaign)

- UEL cooperation with NaSch* carrying sustainability forward to the level of the **European lubricants industry**

*Nachhaltigkeit Schmierstoffindustrie*