Agenda

1. BASF – We create chemistry

2. Fuel and Lubricant Solutions – Your Leading Solution Provider
BASF – We create chemistry

- Our chemistry is used in almost all industries
- We combine economic success, social responsibility and environmental protection
- Sales 2017: €64,457 million
- EBIT 2017: €8,522 million
- Employees (as of December 31, 2017): 115,490
- 6 Verbund sites and 347 other production sites
Chemicals – a growth industry
Global annual growth rate of ~3.4%*

- Agriculture
- Health & nutrition
- Energy & resources
- Construction & housing
- Consumer goods
- Transportation
- Electrical & electronics

Chemistry as enabler to meet current and future needs

- ~10bn people by 2050
- 70% of the world population will live in cities by 2050
- 50% more primary energy consumption by 2050
- 30% more food needed by 2050

*Average annual real change 2018-2020; BASF Report 2017 p.121
Our purpose, strategic principles and values

Why

We create chemistry for a sustainable future

What

1. We add value as one company
2. We innovate to make our customers more successful
3. We drive sustainable solutions
4. We form the best team

How

- Creative
- Open
- Responsible
- Entrepreneurial
Organization of the BASF Group

- Combined into five segments, 13 divisions bear operational responsibility and manage our 55 global and regional business units.
- The operating divisions develop strategies for the 86 different strategic business units.
- The regional divisions contribute to the local development of BASF’s business, help to exploit market potential and are responsible for optimizing the infrastructure for our business.
- Eight functional units and seven corporate units support the BASF Group’s business activities.
BASF’s Segments

Chemicals
- Petrochemicals
- Monomers
- Intermediates

Performance Products
- Dispersions & Pigments
- Care Chemicals
- Nutrition & Health
- Performance Chemicals

Functional Materials & Solutions
- Catalysts
- Construction Chemicals
- Coatings
- Performance Materials

Agricultural Solutions
- Crop Protection

Oil & Gas
- Oil & Gas
Sales* and EBIT in the regions 2017

Figures in Million €

- **North America**
  - Sales: 15,937
  - EBIT: 1,236

- **Europe**
  - Sales: 30,778
  - EBIT: 4,742

- **South America, Africa, Middle East**
  - Sales: 4,102
  - EBIT: 335

- **Asia-Pacific**
  - Sales: 13,658
  - EBIT: 2,209

*By location of company*
Innovation – meeting challenges, developing new business areas

Research for the future: With our innovative products and processes, we provide sustainable solutions for global needs.

- Expenditures for research and development €1,888 million
- Around 10,000 employees worldwide involved in research and development
- Around 3,000 research projects
- Around 800 new patents filed
Our purpose

We create chemistry for a sustainable future

We want to contribute to a world that provides a viable future with enhanced quality of life for everyone. We do so by creating chemistry for our customers and society and by making the best use of available resources.

We live our corporate purpose by:
- Sourcing and producing responsibly,
- Acting as a fair and reliable partner,
- Connecting creative minds to find the best solution for market needs.

For us, this is what successful business is all about.
Our strategic principles

1. We add value as one company
2. We innovate to make our customers more successful
3. We drive sustainable solutions
4. We form the best team
Sustainability along the value chain

**Material aspects**

- We source responsibly
- We produce safely for people and the environment
- We produce efficiently
- We respect people and treat them fairly
- We drive sustainable solutions

*Material aspects include, for example, energy and climate, water, resources and ecosystems, responsible production and employment & employability.*
Partnerships drive sustainability

**Initiative “Together for Sustainability”**
- Joint initiative of leading chemical companies since 2011
- Standardized and shared supplier evaluations and audits
- Implementation of follow-up processes where needed

Enhancing sustainability along the supply chain
We source responsibly

Our supply chain sustainability goals and KPIs 2017

513 sustainability assessments initiated through an external service provider

120 raw material supplier sites audited on EHS

Goal:

70% of relevant suppliers evaluated with regard to their sustainability performance by 2020

Clear targets for supplier evaluation defined, development of action plans
Sustainability along the value chain

Material aspects* include, for example, energy and climate, water, resources and ecosystems, responsible production and employment & employability.
We integrate sustainability in our management systems

Sustainability integrated in our business strategies

Sustainability anchored in our organization

Strategy Process

Sustainability Analysis

SD measures & milestones defined

Board of Executive Directors of BASF SE

Corporate Sustainability Board
- Chair: Member of the Board

Stakeholder Advisory Council
- Chair: CEO

Sustainability Core Team
- Chair: Sustainability Strategy

Sustainability Communities

Operating divisions
- Regions
- Functional units
- Central functions
Verbund advantages reduce the environmental impact

Efficiency drivers: heat integration, process control and process integration

BASF “Verbund” avoided 3.9 million t of CO₂ emissions in 2017

Verbund

Antwerp

Ludwigshafen

Nanjing

Geismar

Freeport

Kuantan

Verbund

- Advantages reduce environmental impact
- Efficiency drivers: heat integration, process control and process integration
- BASF “Verbund” avoided 3.9 million t of CO₂ emissions in 2017
Energy and climate protection

Greenhouse gas emissions per metric ton of sales product by 2020 (baseline 2002)*

-40% Status 2017: -35.5%

Energy efficiency Coverage of our primary energy demand through certified energy management systems (ISO 50001) at all relevant sites

90% Status 2017: 54.3%

* Excluding oil and gas production
Occupational safety and process safety

Lost-time injury rate per one million working hours by 2025

- \( \leq 0.5 \)
- Status 2017: 1.4

Process safety incidents per one million working hours by 2025

- \( \leq 0.5 \)
- Status 2017: 2.0
Sustainability along the value chain

Suppliers

We source responsibly

BASF

We produce safely for people and the environment

We produce efficiently

Customers

We drive sustainable solutions

We respect people and treat them fairly

* Material aspects include, for example, energy and climate, water, resources and ecosystems, responsible production and employment & employability.
Sustainable Solution Steering® – How our products contribute to sustainability

Goal: Increase the share of Accelerators to 28% by 2020.
Solutions for a sustainable future

Examples of Accelerator Solutions

**Acronal® MB**
From biomass to dispersions

**Sokalan® RO 3500**
Antiscalant for reverse osmosis membrane treatment for water reuse applications

**Ultramid® Flex F38**
Partly biobased copolymer

**PrimeCube®**
for coating truck cabins.

**Vault® HP**
Biological seed treatment system for soybeans and other dicots

**Merivon®**
Fungicide for advanced disease control and plant health

**Natuphos® E**
Enzyme which helps pigs and poultry better utilize phosphorous

**Glasurit 923-610 HS Clear**
Clearcoat for shorter processing times and energy savings
Sustainability along the value chain

Material aspects* include, for example, energy and climate, water, resources and ecosystems, responsible production and employment & employability.

Suppliers

- We source responsibly

BASF

- We produce safely for people and the environment
- We produce efficiently

Customers

- We drive sustainable solutions

We respect people and treat them fairly
“Value-to-Society” approach measures our contribution to a sustainable future

Our economic, social and environmental value contribution

- Wages
- Taxes
- ...

Positive contribution

Impact on people and environment

Negative effects

- Emissions
- Resources
- ...

Value-to-Society in monetary terms (€)
Value-to-Society results 2016

We deliver a significant net positive value contribution along the value chain

- Total value contribution made by BASF purchase
- Total impact of BASF’s direct and indirect suppliers and their supply chains
- Total value contribution made by BASF operations
- Total impact of our customers in their industries

<table>
<thead>
<tr>
<th>Net income</th>
<th>Amortization</th>
<th>Taxes</th>
<th>Wages &amp; benefits</th>
<th>Human capital</th>
<th>Health &amp; safety</th>
<th>Air emissions</th>
<th>GHGs</th>
<th>Land use</th>
<th>Waste</th>
<th>Water consumption</th>
<th>Water emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full supply chain</td>
<td>Own operations</td>
<td>Customer industries</td>
<td></td>
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<tr>
<td>Direct suppliers</td>
<td>Direct suppliers</td>
<td>Direct customers in industries supplied by BASF</td>
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</table>

Billion €
Through our business we contribute to the UN SDGs

BASF

- contributes to the UN SDGs through products and solutions along the value chain
- addresses the SDGs with its materiality topics
- uses the SDGs as orientation for BASF’s own goal setting
- will continue to monitor the SDGs by using established indicator systems (e.g., GRI)
- is in continuous dialogue with external stakeholders to establish trustful partnerships on the way to reaching the SDGs

In particular, we contribute to:

- Clean Water and Sanitation (6)
- Affordable and Clean Energy (7)
- Decent Work and Economic Growth (8)
- Industry, Innovation and Infrastructure (9)
- Responsible Consumption and Production (12)
- Climate Action (13)
Our social engagement

Two approaches

Corporate Citizenship
- Donations
- Community engagement
- Corporate volunteering
- Sponsoring

Starting Ventures
- Business-oriented projects

One goal

Improve quality of life…
… for the communities around our sites and worldwide

… for low-income consumers and value chain partners
Sustainability networks

Sustainability requires dialogue and partnership with stakeholders

- We engage in sustainability networks
- to better understand trends in society as the drivers of our business
- to help shape measurement and performance standards
- to partner for joint contributions to Sustainable Development

Examples
Sustainability Ratings, Rankings and Awards

CDP Disclosure Leadership
BASF is one of the world’s leading companies in reporting on climate protection and in sustainable water. BASF has been included in the „CDP Water A“ list for the second time.

FTSE ESG Rating & FTSE4Good Global Index
BASF received the highest score in the chemical industry in ESG rating and has been included again in the FTSE4Good Global Index.

MSCI
In 2017, BASF achieved a AA-ESG rating the fifth time in a row and, therefore, currently belongs to the top 13% of the industry group „Diversified Chemicals“.

Sustainalytics
BASF has scored in the overall ESG rating well, whereas the company has even finished as Leader in the Governance category.
Agenda

1. BASF – We create chemistry

2. Fuel and Lubricant Solutions – Your Leading Solution Provider
Fuel and Lubricant Solutions
Part of Performance Chemicals Division

- Antioxidants
- Light stabilizers
- Process stabilizers
- Flame retardants

Oilfield and Mining Solutions
- Process chemicals for extraction of oil, gas, metals and minerals
- EOR chemicals

Fuel and Lubricant Solutions
- Automotive fluids
- Mineral oil additives
- Polyisobutenes
- Base stocks for lubricants and components for metalworking fluids
- Lubricant additives
- Compounded lubricants

Paper and Water Chemicals
- Process chemicals and functional chemicals for paper and board manufacturing, and water treatment
- Kaolin
- Membrane technologies
### Partner for Fuel And Lubricant Solutions

#### Our Business Segments

<table>
<thead>
<tr>
<th>Polyisobutenes</th>
<th>Mineral Oil Additives</th>
<th>Automotive Fluids</th>
<th>Lubricant Additives</th>
<th>Base Stocks for Lubricants &amp; Components for Metalworking Fluids</th>
<th>Compounded Lubricants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low, Medium and High Molecular Weight Polyisobutenes (PIB)</td>
<td>Fuel Additives</td>
<td>Engine Coolants</td>
<td>Antioxidants</td>
<td>Base Stocks</td>
<td>Transmission Fluids</td>
</tr>
<tr>
<td></td>
<td>Aviation Fuel Additives</td>
<td></td>
<td>Antiwear Additives</td>
<td>Thickeners</td>
<td>Axle Lubricants</td>
</tr>
<tr>
<td></td>
<td>Refinery Additives</td>
<td></td>
<td>Extreme Pressure Additives</td>
<td>Emulsifiers</td>
<td>Industrial Gear Oils</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Metal Deactivators</td>
<td>Solubilizers</td>
<td>Biodegradable Hydraulic Fluids</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Corrosion Inhibitors</td>
<td></td>
<td>Industrial Compressor Lubricants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pour Point Depressants</td>
<td></td>
<td>Refrigeration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Viscosity Modifiers</td>
<td></td>
<td>Compressor Lubes</td>
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</tr>
</tbody>
</table>

- Antioxidants
- Antiwear Additives
- Extreme Pressure Additives
- Metal Deactivators
- Corrosion Inhibitors
- Pour Point Depressants
- Viscosity Modifiers
- Base Stocks
- Thickeners
- Emulsifiers
- Solubilizers
- Transmission Fluids
- Axle Lubricants
- Industrial Gear Oils
- Biodegradable Hydraulic Fluids
- Industrial Compressor Lubricants
- Refrigeration Compressor Lubes
Well Connected to the Industries We Serve

BASF Industry Platform – Fuel and Lubricant Solutions

BASF Production Verbund
- Cracker Products
- Base chemicals
- Specialty chemicals
- External sourcing of components

BASF Knowledge Verbund
- Testing facility Iselin
  - Catalyst knowledge
- Competence Center Fuel & Lubes
- Industry Groups
  - Central Research

Transportation / Industrial OEMs
- Dedicated additive formulations
- Finished products

Mineral Oil & Lubricant Companies
- Fuel performance and lube oil additive packages, extensive tech service and formulation expertise

Package Houses
- Raw materials and components
- Additives, base stocks and packages, tech service, innovation & joint development
- Ready-to-use formulated products
## BASF Aspires to be a Leading Fuel and Lubricant Solutions Provider

### What our aspiration is...
- We want to leverage synergies between fuels and lubricants for the benefit of our customers, based on chemical knowledge.
- We aspire to be the partner of choice to offer innovative, sustainable solutions for your needs.
- We target a share of products younger than 5 years to be > 20%.
- We will support global growth ambitions for strategic customers in emerging markets by adequate investments in assets and capabilities.

### ... and what it also implies!
- We will not become a major package provider for engine oils, however we will focus on developing differentiated components.
- We focus on developing sustainable solutions in base stocks, lubricant additives and compounded synthetic lubricants.
- We do not aspire to be an opportunistic supplier but build long-term positions with our customers.
Our Solutions Contribute to Sustainable Development …

Automotive Fluids

Mineral Oil Additives

Lubricant Additives

Base Stocks for Lubricants & Components for Metalworking Fluids

Compounded Lubricants

… and support differentiation based on measurable performance
Partner for Sustainable Solutions
Example: Gasoline Performance Packages

<table>
<thead>
<tr>
<th>Mineral Oil Additives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Additives</td>
</tr>
<tr>
<td>Aviation Fuel Additives</td>
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<tr>
<td>Refinery Additives</td>
</tr>
</tbody>
</table>

**CO₂ Savings (million t.) by using BASF's Gasoline Performance Packages (GPP)**

<table>
<thead>
<tr>
<th>Year</th>
<th>CO₂ Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>6</td>
</tr>
<tr>
<td>2020</td>
<td>12</td>
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</tbody>
</table>

**Market Need**
- Reduced CO₂ emissions to comply with environmental standard
- Differentiation in fuel markets

**Solution**
- Fuel economy gains with BASF GPP can significantly save CO₂

> 5 mio passenger cars can drive one month without CO₂ emission

→ Mitigate effects of low fuel quality / After Sales opportunities

- Climate Change
- Resource Efficiency
- Energy
Partner for Sustainable Solutions
Example: Engine Coolants

Automotive Fluids

Engine Coolants (Glysantin®)
Brake Fluids

Engine Coolants for Fuel Cells

Market Need

- Safe and efficient fluids to support fuel cells in transportation

Solution

- BASF has developed a fuel cell coolant
- Development partnerships with leading OEMs exist

Climate Change
Resource Efficiency
Energy

→ We support the development of innovative engine technologies
Partner for Sustainable Solutions
Example: Axle Lubricants

<table>
<thead>
<tr>
<th>Compounded Lubricants</th>
<th>Waste Reduction</th>
<th>Cost Savings</th>
<th>Climate Change</th>
<th>Resource Efficiency</th>
<th>Durability</th>
<th>Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Fluids</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Axle Lubricants</td>
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<td></td>
<td></td>
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<tr>
<td>Industrial Gear Oils</td>
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<tr>
<td>Hydraulic Fluids</td>
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<td></td>
<td></td>
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<tr>
<td>Industrial Compressor Lubes</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Refrigeration Compressor Lubes</td>
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</tbody>
</table>

**Fuel Savings with BASF’s Fuel Economy Axle Lubricants for Heavy Duty Trucks**

<table>
<thead>
<tr>
<th></th>
<th>Ø Annual US production of HD trucks (200,000 units)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 year</td>
</tr>
<tr>
<td><strong>Fuel Savings</strong></td>
<td>130 mn l/yr</td>
</tr>
<tr>
<td><strong>CO₂ Reduction</strong></td>
<td>350 kt/yr</td>
</tr>
</tbody>
</table>

**Market Need**
- Reduced fuel consumption and carbon footprint

**Solution**
- An unique axle oil formula providing best heavy duty truck drive system performance and economy

→ We provide you with selling points for your customers

| 46 |
Cascade Technology and Business Models Globally
Fuel and Lubricant Solutions is globally well connected across all functions
Global Partner with Local Delivery Capabilities
Lab Footprint for R&D

North America
Tarrytown, USA

Europe and Emerging Markets
Ludwigshafen, Germany

Asia Pacific
Shanghai, China
Global Partner with Local Delivery Capabilities
Tech Service

North America
- Tarrytown/USA → lubricant additives, compounded lubricants
- Wyandotte/USA → mineral oil additives

South America
- Jacarei/USA → compounded lubricants

Europe and Emerging Markets
- Ludwigshafen/D → mineral oil additives, lubricant additives, compounded lubricants
- Antwerp/B → mineral oil additives
- Chesano Maderno/I → mineral oil additives
- Moscow/RUS → mineral oil additives

Asia Pacific
- Chandivali/I → lubricant additives, automotive fluids
- Shanghai/CN → mineral oil additives
- Jinshan/CN → compounded lubricants
Global Partner with Local Delivery Capabilities

Testing Facilities

North America
Iselin/USA

Europe and Emerging Markets
Ludwigshafen, Germany

Asia Pacific
External: CRAES – Beijing/China

Global
other external testing facilities
Inhouse test center to measure performance of high-quality fuel additives

13 full-size engines on test benches to support new product development

Test procedures accredited and internationally recognized

State-of-the-art hardware and software

Linked with testing facilities of BASF Catalysts in Iselin, NJ, USA, and Hannover, Germany

Global presence through co-operation with external engine labs: TRC (USA), Intertek (USA), MAUA (Brasil), CRAES (China), APL (Germany)

DIN EN ISO 9001 : 2000

DIN EN ISO/IEC 17025
Global Partner with Local Delivery Capabilities
Production Footprint

- **Cincinnati/US**
  - Lubricants and Additives

- **Puebla/MX**
  - Lubricants and Additives

- **Geismar/US**
  - Mineral Oil Additives

- **Antwerp/BE**
  - Mineral Oil Additives

- **Meaux/FR**
  - Lubricants and Additives

- **Lampertheim/DE**
  - Lubricants and Additives

- **Duesseldorf/DE**
  - Lubricants and Additives

- **Guaratinguetà/BR**
  - Automotive Fluids

- **Thane/IN**
  - Automotive Fluids

- **Kuantan/MY**
  - Mineral Oil Additives

- **Nanjing/CN**
  - Mineral Oil Additives

- **Shanghai/CN**
  - Automotive Fluids

- **Jinshan/CN**
  - Lubricants and Additives

- **Singapore/SG**
  - Lubricants and Additives
The largest integrated chemical complex in the world

<table>
<thead>
<tr>
<th>Headquarter</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees BASF SE</td>
<td>38,769 *</td>
</tr>
<tr>
<td>Site area</td>
<td>10 km²</td>
</tr>
<tr>
<td>Sales products metric tons p.a.</td>
<td>about 8.5 million</td>
</tr>
<tr>
<td>Road 106 km</td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td>230 km</td>
</tr>
<tr>
<td>Site traffic</td>
<td>2,100 trucks daily</td>
</tr>
<tr>
<td>Shipment</td>
<td>100,000 containers p.a.</td>
</tr>
<tr>
<td>Pipeline system</td>
<td>about 2,800 km</td>
</tr>
<tr>
<td>Production facilities plants</td>
<td>circa 160 production</td>
</tr>
</tbody>
</table>

* as of December 31, 2016
Production and Technology
Benefits from BASF Verbund

- Exploration/Refinery
- Naphtha
- Steam Cracker
- Crude Oil
- Vegetable Oil
- Ethylene
- Ethylene Oxide
- Propylene
- Propylene Oxide
- C4 Olefins
- Isobutene
- Fatty Acids
- Fatty Alcohols
- Waxes
- Glycol Ethers
- Ethylene Glycol
- Polyisobutene
- PIB Amines
- PIBSI
- Esters
- Gasoline PP
- Diesel PP
- Coolants
- Brake Fluids
- Heat Transfer Fluids
- Synthetic Lubricants
- Base Stocks
- Ind. Surfactants
- PIB
- Petrochemicals
- Additives