We create chemistry for a sustainable future
BASF SRI Story September 2020
Cautionary note regarding forward-looking statements

This presentation contains forward-looking statements. These statements are based on current estimates and projections of the Board of Executive Directors and currently available information. Forward-looking statements are not guarantees of the future developments and results outlined therein. These are dependent on a number of factors; they involve various risks and uncertainties; and they are based on assumptions that may not prove to be accurate. Such risk factors include those discussed in Opportunities and Risks on pages 139 to 147 of the BASF Report 2019. BASF does not assume any obligation to update the forward-looking statements contained in this presentation above and beyond the legal requirements.
Resource efficiency – BASF’s Verbund is ideal for CO$_2$ emission reduction

- Combined heat and power plants and integrated energy Verbund prevented 6.4 million metric tons of CO$_2$e emissions in 2019
- Synergies in logistics and infrastructure, minimization of waste
- BASF uses fossil raw materials responsibly: 75% of carbon converted to products, 25% consumed for process energy and converted to CO$_2$ equivalents$^1$
- European emissions trading benchmarks show that BASF’s chemical plants operate at above-average energy efficiency

$^1$ BASF carbon mass balance calculation (2019, non-audited, without oil and gas business)
BASF has a strong track record of CO₂ emission reduction – our goal: CO₂-neutral growth until 2030

- Since 1990, we have doubled our production volumes and cut our GHG emissions in halves; the emission intensity thus decreased by 75%, from 2.2 tons of CO₂e per ton of product to 0.6 tons of CO₂e
- 20 million tons of CO₂e emissions by BASF Group in 2019
- Low-hanging fruits have been harvested; fundamentally new technologies are needed to reduce emissions on a large scale
- We will grow our production volumes without adding further CO₂e emissions until 2030 (intensity to be reduced by 30%)
- BASF is committed to the Paris agreement for climate protection

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1 BASF operations excluding the discontinued oil and gas business; includes other greenhouse gases according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents
BASF’s Carbon Management – our focus to reduce emissions

Potential CO₂ reduction

- We have established a carbon management that involves
  - a research program to develop CO₂-reduced breakthrough technologies
  - shifting our energy mix towards renewable energies
  - continued operational excellence measures

- BASF co-founded the World Economic Forum’s initiative on Collaborative Innovation for Low-Carbon Emitting Technologies in the Chemical Industry

- BASF further enhances transparency: We support the recommendations of the Task Force for Climate-related Financial Disclosure and participated in the “TCFD Preparer Forum for Chemicals” in 2019

Further improve process and energy efficiency

Shift power supply towards renewable energies

Develop breakthrough technologies

Costs and risks
BASF’s CO₂ reduction efforts are focused on main emitters

Example: Verbund site Ludwigshafen
Emissions 2019 in million tons CO₂e

<table>
<thead>
<tr>
<th>Upstream Verbund</th>
<th>Downstream Verbund</th>
<th>Power / Steam</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3</td>
<td>0.3</td>
<td>3.9</td>
</tr>
<tr>
<td>steam cracker</td>
<td>~190 plants</td>
<td></td>
</tr>
<tr>
<td>ammonia</td>
<td>incineration,</td>
<td></td>
</tr>
<tr>
<td>hydrogen</td>
<td>sewage plant</td>
<td></td>
</tr>
<tr>
<td>+14 other plants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Carbon management research program:
  - breakthrough technologies for the most energy consuming basic chemicals (accounting for approximately 70% of the CO₂ emissions of the chemical industry in Europe)
  - electrification and fundamentally new synthesis pathways
  - moving towards low-carbon chemical value chains
Hydrogen – a key element for CO\textsubscript{2}-free chemistry

Methods of H\textsubscript{2} production:

- **Water electrolysis** (CO\textsubscript{2}-free, 55 MWh)
- **Methane pyrolysis** (CO\textsubscript{2}-free, ~10 MWh)
- **Steam reforming** (10 metric tons CO\textsubscript{2}, ~6 MWh\textsuperscript{1})

\textsuperscript{1} for the chemical reaction

\begin{itemize}
  \item One **key challenge** in cutting major emission sources in the BASF production Verbund is access to low cost, energy-efficient CO\textsubscript{2}-free hydrogen.
  \item **Steam reforming** requires only ~6 MWh for the chemical reaction but emits approximately 10 metric tons of CO\textsubscript{2} per metric ton of hydrogen.
  \item **Water electrolysis** is CO\textsubscript{2}-free but requires ~55 MWh of green electricity per ton of hydrogen produced for the entire process.
  \item **Methane pyrolysis** combines low emissions and low energy demand; it could yield CO\textsubscript{2}-free hydrogen while only consuming ~10 MWh of green electricity for the entire process.
\end{itemize}
**Methane pyrolysis – producing CO$_2$-free hydrogen with less electricity**

- We are continuously optimizing processes, gradually replacing fossil fuels with renewable energy and developing new low-emission technologies to further reduce our overall CO$_2$ footprint.
- Methane pyrolysis is a low-emission technology. Electricity is used to heat methane and split it into its components: hydrogen gas and solid carbon.
- Methane pyrolysis requires ~20% of the electricity needed for the very energy-intensive water electrolysis process.
- If renewable energy sources are used, the process yields hydrogen and very pure solid carbon without any CO$_2$ emissions.
CO₂-free hydrogen can reduce the overall Product Carbon Footprint of chemicals in different use cases.
Increasing importance of renewable energy

- In 2019, internally generated power in the BASF Group had a carbon footprint of around 0.26 tons of CO₂ per MWh of electricity and was below the national grid factor at most BASF Group locations (purchased electricity: around 0.46 tons of CO₂ per MWh)

- In 2019, 23 BASF sites were partially or fully powered by emission-free electricity

- Demand for electricity from renewable sources will increase sharply with new, low-carbon electricity-based production processes

- At the Ludwigshafen site in Germany, we would need to roughly triple or quadruple our current electricity use (2019: 6.2 TWh) to fully implement the new production processes

- Availability and price of renewable power as critical success factors

- BASF is investigating different options for renewable power supply
Product Carbon Footprints create transparency for customers – digital solution for all BASF products

- Digital solution calculates cradle-to-gate greenhouse gas emissions
- Based on the total of direct process CO₂ emissions, energy demand and scope 3 upstream CO₂ emissions
- Carbon footprints for 45,000 BASF products in the global portfolio available in the course of 2021
From a linear to a more circular economy – BASF contribution: ChemCycling™

- In 2019, BASF invested €20 million in Quantafuel (pyrolysis of mixed plastic waste and purification of the resulting oil)
- BASF providing technical support in the startup of Quantafuel’s commercial plant in Skive, Denmark

Plastic waste is converted into liquid feedstock and fed into BASF’s value chains

- + can handle mixed plastic waste
- + produces virgin-like raw materials
- + replaces virgin fossil resources
- + CO₂ emissions prevented

1 Compared to conventional plastic production and incineration of plastic waste
Alliance to End Plastic Waste (AEPW) – take action, develop solutions and catalyze investment

- Founded in 2019, BASF is a founding member of the AEPW
- 46 members from entire plastics value chain
- Commitment to spend US$1.5 billion over five years for infrastructure development, innovation, education, engagement and clean-up
- Example: collaboration with non-profit initiative RenewOceans in Varanasi, India (Ganges river)
  - ReFence technology to collect plastic from waterways
  - waste management strategy for university campus
  - strategy for scaling and franchising of the existing model
We source responsibly and strive to improve sustainability performance in the supply chain

- Goal: Cover 90% of our relevant spend\(^1\) with sustainability evaluations by 2025 (2019: 81%), and have 80% of our suppliers improve their sustainability performance upon re-evaluation (2019: 52%)

- Supplier Code of Conduct rooted in internationally recognized standards such as the principles of the UN Global Compact and the International Labor Organization

- Engaged in more than 20 initiatives to improve sustainability performance and working conditions in the supply chain, e.g., Global Battery Alliance (GBA), Responsible Cobalt Initiative (RCI), Roundtable on Sustainable Palm Oil (RSPO)

- Founding member of the “Together for Sustainability” initiative for the joint evaluation of suppliers

- 4,197 sustainability assessments and 309 audits carried out by an independent service provider for member companies in 2019, thereof 537 assessments and 81 audits for BASF

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\(^1\) We understand relevant spend as procurement volumes with relevant suppliers. We define relevant suppliers as Tier 1 suppliers showing an elevated sustainability risk potential as identified by our risk matrices and our purchasers’ assessments. We also use further sources of information to identify relevant suppliers such as evaluations from Together for Sustainability (TfS), a joint initiative of chemical companies for sustainable supply chains.
Global water stewardship – strong commitment to local water management

- Further increase of water stress areas expected worldwide (climate change, population growth and economic development)
- Growing competition among water users expected (e.g., households, agriculture, industry)
- In 2019, BASF was included in CDP’s “Water A List” for sustainable water management
- Goal: Introduction of sustainable water management at all Verbund sites and sites in water stress areas by 2030, representing 93% of BASF’s entire water abstraction
  - water stress areas are regions where more than 40% of available water is used by industry, household and agriculture
  - status 2019: 36%
Engaged employees – proud ambassadors for what BASF stands for

- BASF’s employees and their engagement are key to enable our long-term business success

- Annual goal: More than 80% of our employees feel that at BASF, they can thrive and perform at their best

- To measure the engagement, we
  - collect regular feedback of our employees
  - engage our employees in discussions on the results
  - identify improvement areas and drive follow-up activities
  - report on the current status in the BASF Report

- Global survey “Employee Voices” in 2019: 79% of all participants agreed to the statement that at BASF they can thrive and perform at their best
Around 30% of BASF Group sales from sustainable solutions – leveraging our innovation power

- Portfolio segmentation: >50,000 specific product applications analyzed by 2019 (€51.9 billion in sales, 96.3% of relevant portfolio)
- >12,000 Accelerators across all business segments
- Accelerator margins on average ~6 percentage points above the rest of assessed portfolio
- Goal: €22 billion of sales with Accelerator products by 2025 (2019: €15.0 billion)
- Stronger integration in R&D pipeline, business strategies and M&A projects
- We will stop selling Challenged products within maximum five years after classification

Percentage of sales 2019

- 28.9% Accelerator
- 61.9% Performer
- 9.1% Transitional
- 0.1% Challenged

Substantial sustainability contribution in the value chain
Meets basic sustainability standards on the market
Specific sustainability issues, actively addressed
Significant sustainability concern identified and action plan developed

1 The product portfolio acquired from Bayer has been partially assessed
Sustainable Solution Steering – BASF’s Accelerators contribute to the UN Sustainable Development Goals

Sales shares of contributing Accelerators (%)

- Cost savings downstream: 28.9%
- Biodiversity and renewables: 9.1%
- Climate change and energy: 61.9%
- Emission reduction: 9.1%
- Resource efficiency: 61.9%
- Water: 0.1%
- Health and safety: 9.1%
- Hunger and poverty: 0.1%

Primarily addressed SDGs

- 2 Zero Hunger
- 3 Good Health and Well-Being
- 6 Clean Water and Sanitation
- 7 Affordable and Clean Energy
- 9 Industry, Innovation and Infrastructure
- 11 Sustainable Cities and Communities
- 12 Responsible Consumption and Production
- 13 Climate Action
- 15 Life on Land
- 8 Decent Work and Economic Growth

(including double nominations)
Innovations for a sustainable future – Accelerator examples

- SLENTEX® – high-performance flexible insulation material
- Formic acid – ecoefficient runway and road deicing
- Acronal® MB – from biomass to dispersions
- ecovio® – compostable cling film for fresh-food packaging
- Inscalis® – insecticide with unique mode of action
- Synative® ES TMP – biodegradable marine lubricants
Electromobility drives battery materials growth – BASF is a leading supplier with global production

- CAM precursor production planned in Harjavalta, Finland
- CAM production planned in Schwarzheide, Germany
- Foundation of BASF TODA Battery Materials (BTBM), Japan
- Tripled capacity at BTBM in Onoda, Japan
- Targeted position in China

**Market projections for 2030:**
- ~25 million electric vehicles built per year
- 1,500-2,500 kt of CAM in electromobility
- €45-60 billion CAM market size
BASF combines battery-materials production and recycling with the goal of closing the loop in the circular economy

Key facts

- Regulation drives demand for recycling
- OEMs will need recycling partners to establish closed loop approaches
- Recycling provides sustainable and cost-efficient access to metals
- BASF has proprietary and differentiating technology along with expertise in recycling
We create chemistry for a sustainable future – overview on sustainability goals and KPIs

<table>
<thead>
<tr>
<th>Energy &amp; climate protection</th>
<th>Goal</th>
<th>Status 2019</th>
<th>Status 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute emissions of CO₂ equivalents¹</td>
<td>≤22</td>
<td>20.1</td>
<td>21.9</td>
</tr>
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<table>
<thead>
<tr>
<th>Production</th>
<th>Goal</th>
<th>Status 2019</th>
<th>Status 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process safety incidents²</td>
<td>≤0.1</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Lost-time injury rate²</td>
<td>≤0.1</td>
<td>0.3</td>
<td>0.3</td>
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<table>
<thead>
<tr>
<th>Water</th>
<th>Goal</th>
<th>Status 2019</th>
<th>Status 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable water management at Verbund sites and sites in water stress areas</td>
<td>100%</td>
<td>35.8%³</td>
<td>50.0%</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Products &amp; solutions</th>
<th>Goal</th>
<th>Status 2019</th>
<th>Status 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales generated by Accelerators⁴ in product portfolio</td>
<td>22</td>
<td>15.0</td>
<td>14.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employees</th>
<th>Annual</th>
<th>Status 2019</th>
<th>Status 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees feel that at BASF, they can thrive and perform at their best</td>
<td>&gt;80%</td>
<td>79%</td>
<td>–</td>
</tr>
<tr>
<td>Women in leadership positions</td>
<td>30%</td>
<td>23.0%</td>
<td>21.7%</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Procurement</th>
<th>Goal</th>
<th>Status 2019</th>
<th>Status 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability assessment of relevant spend⁵</td>
<td>90%</td>
<td>81%</td>
<td>60%</td>
</tr>
<tr>
<td>Suppliers with improved performance upon re-evaluation</td>
<td>80%</td>
<td>52%</td>
<td>–</td>
</tr>
</tbody>
</table>

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¹ Million metric tons; includes other gases according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents
² Per 200,000 working hours including contractor working hours (ICCA)
³ Enlarged definition for water stress areas
⁴ Products with substantial contribution to sustainability; in billion €
⁵ Relevant spend; based on risk matrices, purchasers’ assessments and other sources
BASF in sustainability ratings and rankings

**CDP**
In 2019, BASF achieved a score of A– in the climate category, thus attaining leadership status again; BASF was included in the “Water A list” of leading companies for sustainable water management.

**MSCI ESG Research**
In 2020, BASF was again rated AA and ranks third in “Diversified Chemicals”.

**Sustainalytics**
BASF is “Outperformer” in the overall ESG rating 2020 with strong ratings in social and governance categories.

**FTSE4Good Global Index**
BASF was included again in the FTSE4Good Global Index 2020, with a rank in the top ten of the chemical industry.
### Stakeholders

<table>
<thead>
<tr>
<th>Member companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASF, Bosch, Lufthansa, Mitsubishi Chemical, NOVARTIS, Porsche, Volkswagen, SAP, SK, OECD, Deloitte, EY, KPMG, PwC</td>
</tr>
</tbody>
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<table>
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<tr>
<th>Policy advisors</th>
</tr>
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<tbody>
<tr>
<td>\text{European Commission, The World Bank}</td>
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<table>
<thead>
<tr>
<th>Pro-bono consultants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deloitte, EY, KPMG, PwC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support from politics, financial markets, academia, business, standard setters, civil society</th>
</tr>
</thead>
<tbody>
<tr>
<td>\text{European Commission, The World Bank}</td>
</tr>
</tbody>
</table>

### Companies

- Founded in June 2019, BASF is a founding member of the value balancing alliance.
- From traditional reporting of input and output (e.g., raw materials, CO$_2$ emissions) to impact valuation (e.g., climate change mitigation costs).
- Holistic view along the entire value chain.
- Increase transparency by:
  - standardizing calculations for comparable results
  - piloting in management accounting
  - making outcomes publicly available
- Ambition: transform business from maximizing profits to optimizing value creation.
SLENTEX®
Space saving, flexible high-performance insulation material

- Innovative non-combustible, simple-to-use inorganic aerogel material
- Achieves significantly lower thermal conductivity than conventional insulation materials (lambda value of 19 mW/m • K)
- Allows for very slim composite systems and hence optimized use in space constrained situations
- SLENTEX® can be used flexibly (e.g., on historic facades under monument protection, building elements such as balconies, entrance areas and uneven masonry)
Formic acid
Ecoefficient runway and road deicing

- Better biodegradability than conventional products
- Less corrosive than conventional products, reduced impact on the surrounding flora, not hazardous to animals
- Reduced water treatment demand and costs
- Enabling ecoefficient deicing
- Key customers won: In Europe, all big airports are now using formate salts, the salt of formic acid
Acronal® MB
From biomass to dispersion for premium paints

- First BASF binder for interior paints based on the biomass balance approach launched in 2016
- Replacing fossil raw materials with renewable feedstock at the beginning of the production process
- Less greenhouse gas emissions
- Enabling interior paints that combine environmental responsibility with uncompromising premium quality
- 91% of interviewed professional painters in Germany see an increase in sustainability aspects in tenders
- In total, more than 350 certified biomass balanced products in BASF portfolio
ecovio®
Compostable cling film for fresh-food packaging

- Developed together with Fabbri Group
- Certified compostable according to standards for industrial composting and home composting
- Optimal breathability for an extended shelf life of fresh food
- High transparency and excellent mechanical properties for automatic packaging
- Reducing food waste, lowering greenhouse gas emissions and promoting organic recycling
Inscalis®
Insecticide with unique mode of action

- New standard in the piercing and sucking insect pest market, delivering exceptional control of aphids, whiteflies, jassids and psyllids

- Derived from a natural fermentation process, Inscalis® has a favorable environmental profile exhibiting minimal impact on important beneficial arthropods and pollinators

- With a quick onset of action, Inscalis® insecticide quickly stops insect pests’ feeding, reducing nutrient loss and harmful viral/bacterial pathogens

- Resulting in healthier plants and optimal yields with higher quality
Synative® ES TMP
Environmentally acceptable marine lubricants

- Superior lubrication performance, excellent stability
- Lower impact on the aquatic environment
- Excellent biodegradability
- Renewable content of >80%
- One of few products to enable the formulation of environmentally acceptable lubricants for marine with EU Ecolabel and OSPAR\(^1\) listing
- Key customers won; considerable growth potential, depending on future regulation

\(^1\) Oslo/Paris convention for the protection of the marine environment of the North-East Atlantic