Taking the next step in climate protection— from targets to delivery

Dr. Martin Brudermüller
Chairman of the Board of Executive Directors
BASF Investor Update, March 28, 2022
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 151 to 160 of the BASF Report 2021. BASF does not assume any obligation to update the forward-looking statements contained in this presentation above and beyond the legal requirements.
We have ambitious CO₂ reduction targets

2030
25% CO₂ emissions reduction (compared with 2018)¹

2050
net zero CO₂ emissions¹

¹ Scope 1 and Scope 2; 2030 target compared with 1990: 60% CO₂ reduction
Our two perspectives on emission reductions

BASF Group targets

Scope 2  Scope 1

Reduction measures at site level

CO₂

Products with reduced PCF

kg CO₂e per kg

Product carbon footprint (PCF)

Scope 3¹  Scope 2  Scope 1

¹ Scope 3 emissions from raw materials production by suppliers
Next step: First net-zero and low-PCF products available

A 5% to 15% price increase for net-zero consumer products…

…will cover the 25% to 50% higher production costs for chemicals\(^1\)

\(^1\) CO\(_2\)e emissions (cradle-to-gate), calculated using a McKinsey methodology for analysis
Agenda

1. On the road to reaching our CO$_2$ reduction targets

2. Global reduction efforts, individual site approaches

3. Profitable growth with net-zero and low-PCF products
No downstream decarbonization without upstream decarbonization

BASF greenhouse gas emissions 2018
Million metric tons per year

Global GHG emissions
Scope 1+2

22

Chemical production

11

Energy production

Electric power

Steam

Energy production

Grey-to-green

Power-to-steam

Chemical production

Upstream

Downstream

Chemical production

Upstream

Downstream

Grey-to-green

Power-to-steam

New technologies

Bio-based feedstocks

Continuous opex

1 Includes emissions from process energy

2 Operational excellence measures
Our path to reduce BASF emissions from 2018 to 2030

BASF greenhouse gas emissions (Scope 1 and Scope 2) 2018–2030
Million metric tons

CO₂ reduction in business as is 2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Grey-to-green</th>
<th>Power-to-steam</th>
<th>New technologies</th>
<th>Bio-based feedstocks</th>
<th>Opex</th>
<th>Temporary measures</th>
<th>2030 Business as is 2018</th>
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</thead>
<tbody>
<tr>
<td>2018</td>
<td>21.9</td>
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CO₂ increase from growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Verbund site South China</th>
<th>Growth (organic, inorganic)</th>
<th>2030</th>
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<tbody>
<tr>
<td>2018</td>
<td></td>
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<tr>
<td>2030</td>
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<td>25%</td>
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</table>
We have defined a corridor for reducing our emissions until 2030

Projected BASF greenhouse gas emissions
Million metric tons CO₂ equivalents

<table>
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<tr>
<th>Year</th>
<th>Baseline 2018</th>
<th>Target 2030</th>
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<tbody>
<tr>
<td>2018</td>
<td>21.9</td>
<td>16.4</td>
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Projected emissions without mitigation 2018
Construction of offshore wind farm Hollandse Kust Zuid on track
Switching our power to renewable energy will be the main driver of emission reduction until 2025

BASF strives for 100% of power demand 2021 to be green by 2030

BASF power consumption expected to increase strongly due to electrification on our journey to net zero

BASF pursues a make-and-buy strategy to secure access to renewable power

Early investments in renewable power assets expected to offer advantageous economics in the future
We are delivering with a pipeline of projects to secure supply of renewable energy at competitive prices

BASF power demand and renewable supply projection in Europe
Terawatt hours

- Contracted projects in Europe:
  - Long-term PPAs signed with ENGIE and Ørsted
  - Investment in largest offshore wind farm; joint ownership with Vattenfall
- Pipeline includes project idea for a wind farm together with RWE
- BASF Renewable Energy GmbH to focus on supplying BASF Group companies in Europe with renewable energy

Grey energy  Green energy  Additional need for green energy for electrification, depending on availability
High potential from changing to power-to-steam allows decoupling from electricity supply

Current situation

Gas-fired power plants
Gas-fired steam boilers

Fossil-based steam generation

Future situation

E-boilers
Heat pumps
E-drives

Electrification of steam generation and reduction of steam consumption
Future steam supply concept for Ludwigshafen: Heat pumps to replace fossil-generated steam from today’s power plants

Overview of projected heat pumps at Ludwigshafen site

- Heat pump (hub)
- Off-heat
- Power plant
- Grid connection

Comprehensive set of technologies

- Incineration of by-products
- Gas boiler technology
- High-pressure steam
- Cogen or gas boiler technology
- Heat pump technology
- Medium-pressure steam
- E-boiler technology
- Heat pump technology
- Freeing up steam for use in central grid by replacing steam drives
- E-drives

Potential to replace up to 1,100 tons per hour of fossil-generated steam
First high-temperature heat pump to supply steam to the BASF Verbund in Ludwigshafen

- Integration of a high-temperature heat pump into the BASF Verbund implemented on commercial scale
- Use of waste heat and changes to operation of the steam network will avoid 160,000 tons of CO₂ emissions per year
- Annual cooling water consumption reduced by more than 20 million cubic meters
- Engineering design with Siemens Energy is progressing as planned
- Startup targeted for Q2 2024
Preparations for the world’s first electrically heated steam cracker furnace on track

- Goal is to scale up electrically heated steam cracker furnace concepts in cooperation with Linde and SABIC
- Startup of the pilot plant planned for 2023 subject to positive public funding decision
Operational excellence – a lever to continuously increase our energy efficiency and avoid CO₂ emissions

Reduction of CO₂ emissions through operational excellence measures
Kilo tons per year, cumulative

- Opex measures helped to reduce CO₂ emissions by ~1 million tons from 2013 to 2021
- In 2021, ~400 opex measures were realized that reduced CO₂ emissions
- Examples:
  - Plant for plastics production repurposed off-heat to generate steam for other plants, equaling ~5,000 tons lower CO₂ emissions annually
  - Further optimized process control in nitric acid cluster avoids 145,000 tons of CO₂ equivalents per year
- New process to foster opex projects linked to CO₂ emission reductions

1 Forecast
Agenda

1. On the road to reaching our CO$_2$ reduction targets

2. Global reduction efforts, individual site approaches

3. Profitable growth with net-zero and low-PCF products
Antwerp is BASF’s second largest Verbund site worldwide
Antwerp Verbund site with the aspiration to be the first petrochemical site to approach net zero in 2030

Projected CO₂ emissions of BASF at Antwerp Verbund site¹
Million metric tons

<table>
<thead>
<tr>
<th>Year</th>
<th>Grey-to-green</th>
<th>CCS (phase 1)</th>
<th>New technologies incl. CCS (phase 2)</th>
<th>Power-to-steam</th>
<th>Remaining emissions</th>
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<tbody>
<tr>
<td>2021</td>
<td>3.8</td>
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¹ Emissions from joint ventures are considered according to share of ownership based on normal plant utilization and including published extension projects.
Verbund site Antwerp: CCS is a mature drop-in solution for large-scale process emission abatement

- Project consortium Antwerp@C has entered the FEED phase for CO2 infrastructure in the port of Antwerp; BASF is one of the founding members
- Project Kairos@C – a consortium of BASF and Air Liquide – has entered the project engineering phase at BASF’s Antwerp Verbund site
- International cross-border CCS value chain aiming to reduce BASF’s CO2 emissions in Antwerp by 1 million tons per year in a first step
- Planned to be operational by 2025
Zhanjiang to become BASF’s third largest Verbund site worldwide
Verbund site Zhanjiang uses latest technologies to reduce CO₂ footprint compared with standard gas-powered petrochemical site

Projected CO₂ emissions of BASF at Verbund site in South China

Million metric tons

- Coal-powered petrochemical site of similar scope
- Gas-powered petrochemical site
- Syngas incl. CO₂ recycling
- Cracker Verbund integration
- Cracker eDrive
- Renewable energy
- Power supply
- Accelerated supply of 100% renewable electricity targeted
- Phase 1 full start-up
- 2050 net zero

6–9
4.2
1.8
Schwarzheide site is a prototype for the energy transformation at mid-sized sites

- **24-megawatt solar farm** under construction in joint venture with EnviaM; **startup** planned for **Q2 2022**
  - Energy to be used for production of cathode active battery materials with best-in-class **CO₂ footprint**
  - **Long-term energy supply** at attractive prices

- Installation of **stationary battery** in solar farm planned to buffer fluctuations in renewable energy supply

- Modernization of gas and steam turbine power plant in 2022 for more flexibility in **integrating renewable energy**
  - 10% more electricity with **16% lower CO₂ emissions**
Our roadmap is backed by robust calculations and solid planning

Projected BASF greenhouse gas emissions
Million metric tons CO₂ equivalents

Lower CO₂ emissions already materialized until 2020

Projected emissions without mitigation 2018
11 million tons of CO₂ avoided annually by 2030

Baseline 2018
21.9

Target 2030
16.4

Technology-based CO₂ abatement projects
Grey-to-green (including RECs)
Opex
Structured approach to capex spending

Current project pipeline and projected capex

Pilot scale

- eFurnace
- Water electrolysis
- Methane pyrolysis

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<thead>
<tr>
<th>Pilot scale</th>
<th>2021</th>
<th>2025</th>
<th>2030</th>
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<tr>
<td>eFurnace</td>
<td>€2-3b</td>
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<td>Water electrolysis</td>
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<td>Methane pyrolysis</td>
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<th>2021</th>
<th>2025</th>
<th>2030</th>
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<tbody>
<tr>
<td>Engineering and construction¹</td>
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<td>Pilot furnace</td>
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<td>First commercial furnace</td>
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<td>Global roll-out</td>
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<td>Operation</td>
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<td>Global roll-out</td>
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<td>Trial reactor</td>
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<td>Pilot engineering and construction</td>
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Commercial scale

- CCS
- Heat pumps
- E-boilers & e-drives

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<td>E-boilers &amp; e-drives</td>
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Operational excellence

- 2021: < €1 billion
- 2025: €2-3 billion
- 2030:

¹ Depending on public funding
Agenda

1. On the road to reaching our CO\textsubscript{2} reduction targets

2. Global reduction efforts, individual site approaches

3. Profitable growth with net-zero and low-PCF products
Consumers will drive demand for net-zero and low-PCF products

Transformation enabled by BASF

- Chemical raw materials are key contributors to PCFs of consumer products – in the case of shampoo, more than 90%
- BASF is able to offer its customers net-zero and low-PCF chemicals by applying a toolbox of emission reduction measures – from raw material choice to green energy
- End consumers are expected to drive demand for net-zero and low-PCF products
We create transparency on the CO$_2$ emissions of our raw materials as an important step in reducing BASF’s Scope 3 emissions

BASF’s CO$_2$e emissions from raw material purchase 2021

- BASF is supporting various initiatives to develop and establish workable standards for the chemical industry
- Supplier CO$_2$ Management Program rolled-out in 2021 to collect specific PCFs and align on reduction targets
- More than 700 key suppliers have been approached by the end of 2021, accounting for 50% of Scope 3 emissions$^1$
- Collaboration through knowledge sharing on PCF calculation methodology ongoing to ensure engagement and quality of data
- First suppliers have committed to reducing their emissions
- BASF will make PCFs a buying criterion to ensure PCF reduction of its sales products

$^1$ GHG protocol Scope 3.1: purchased goods and services: 55 million tons CO$_2$e, thereof 53 million tons purchased raw materials
More and more market leaders in important BASF customer industries are committing to reducing their Scope 3 emissions

First movers in decarbonization set to profit from strong market pull for low-PCF products

>70% of the top 20 companies in relevant customer industries had committed to CO₂ emission reduction targets¹ by 2021; almost half have defined Scope 3 emission targets

Customer industries: apparel, automotive, electronics, FMCG and packaging

We have built an industry-leading system enabling us to provide product carbon footprints calculated with a certified digital solution.

**Scope 3**
Emissions caused by suppliers and generation of raw materials

- TÜV-certified\(^2\)
- Meets ISO standards\(^3\)
- Calculates product carbon footprints cradle-to-gate

**Scope 1 + 2**
Emissions caused by own operations\(^1\)

- Energy generation and chemical processes
- ISO 14067:2018

**Customer benefits**
- Transparency on CO\(_2\) emissions
- Identification of main reduction levers
- Certified software
- Transparent documentation
We help our customers to reduce their CO₂ footprints
BASF and Henkel join forces to substitute fossil feedstock in Henkel’s Laundry & Home Care and Beauty Care products

- Henkel will substitute fossil with renewable carbon feedstock from BASF for most of Henkel’s Laundry & Home Care and Beauty Care businesses in Europe over the next four years.

- Following a successful pilot with Henkel’s cleaning and detergent brand Love Nature in 2021, we are now going big with Henkel’s core brands like Persil, Pril, Fa and Schauma.

- Ultimately, around 110,000 tons per year of ingredients will be substituted with renewable carbon sources with BASF’s certified biomass balance approach.

- The program will ramp up quickly and avoid around 200,000 tons of CO₂ emissions in total.
BASF and Henkel are making a significant joint commitment for a sustainable future

“We are delighted to build on our cooperation with BASF. We are on a journey toward an environmental transformation of our business model. Integrating BASF’s biomass balance approach into our supply chain as an early-mover is a right step in that direction.”

Carsten Knobel
Chief Executive Officer
What we need from German and EU politics to stay on track to net zero 2050

- **Renewable energy capacities**: Accelerate renewable energy sources (RES) projects in the EU and adjust tender criteria to increase economics of non-funded industrial RES projects.

- **Infrastructure**: Expand electricity grids and interconnectors between countries and build a cross-border CO\textsubscript{2} infrastructure as well as an EU regulatory framework in Northwestern Europe.

- **Funding**: Expand funds and improve funding policies to accelerate deployment of new technologies and incentivize frontrunners.

- **Processes and lead times**: Accelerate decision-making processes for publicly funded investment and innovation projects as well as permitting processes.

- **Competitiveness**: Maintain cost competitiveness for existing chemical manufacturing, e.g., via free allocation and indirect cost compensation at benchmark level in EU-ETS, and avoid distortions for exports under a potential EU carbon border adjustment mechanism.
We are ready for the next level in our transformation – sustainable growth with products with reduced carbon footprints

- The market for products with reduced carbon footprints is expected to grow strongly.
- BASF prepares to offer net-zero products at scale calculated with a certified digital solution and expects that the market will be short by 2030.
- At BASF’s integrated sites, absolute CO₂ emissions can be reduced significantly with a limited number of measures.
- The scale of our Verbund sites allows lower specific capex for CO₂ reduction.
- This will translate into affordable net-zero and low-PCF products to meet increasing customer demand.

BASF’s transformation provides the basis for future profitable growth.