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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.

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We have ambitious CO_2 reduction targets

25%
CO_2 emissions reduction
(compared with 2018)[1]

net zero
CO_2 emissions[1]

[1] Scope 1 and Scope 2; 2030 target compared with 1990: 60% CO_2 reduction

Our two perspectives on emission reductions

BASF Group targets

Scope 2 | Scope 1

Reduction measures at site level

CO_2

Product carbon footprint (PCF)

Scope 3[1] | Scope 2 | Scope 1

Products with reduced PCF

kg CO_2e per kg

[1] Scope 3 emissions from raw materials production by suppliers

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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_2e emissions (cradle-to-gate), calculated using a McKinsey methodology for analysis

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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

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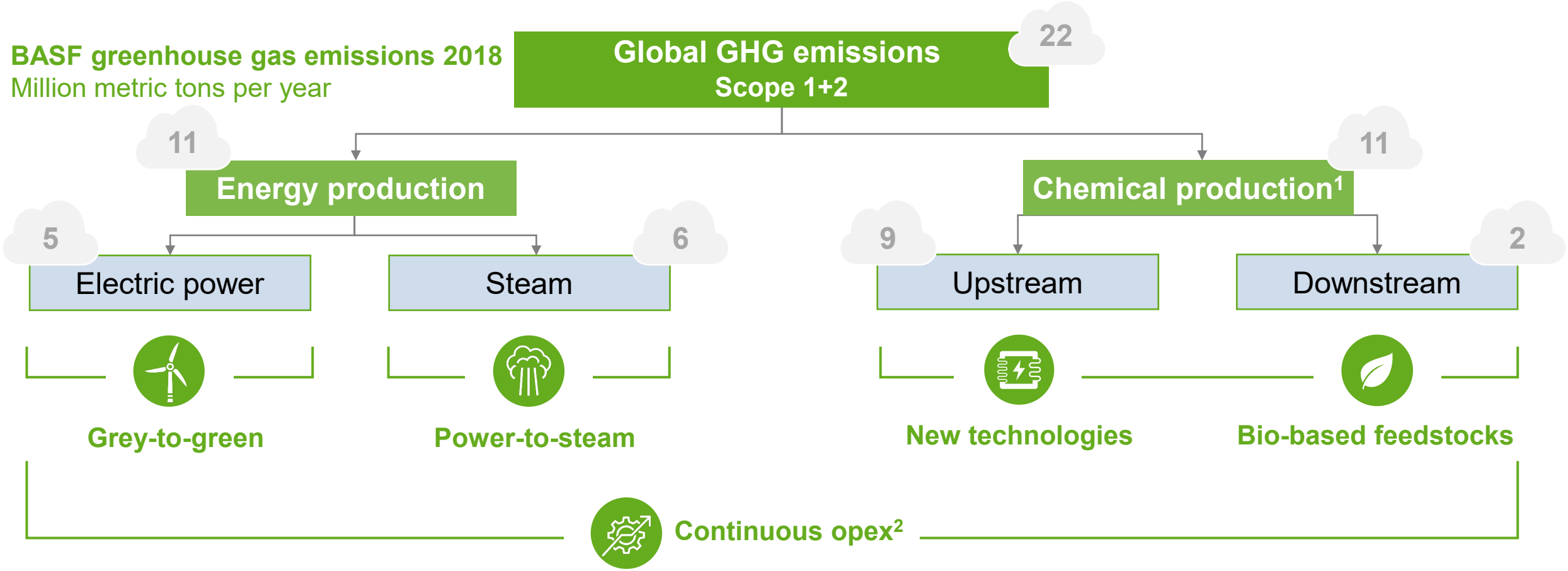
No downstream decarbonization without upstream decarbonization

BASF greenhouse gas emissions 2018
Million metric tons per year



[1] Includes emissions from process energy [2] Operational excellence measures

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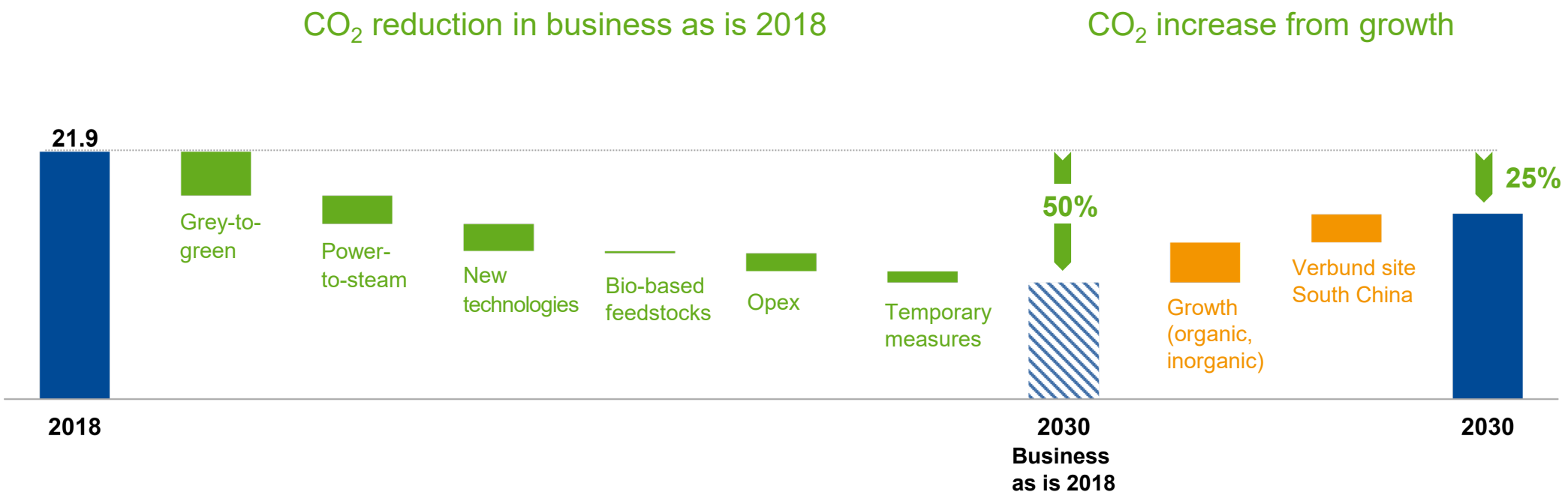
Our path to reduce BASF emissions from 2018 to 2030

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

Million metric tons



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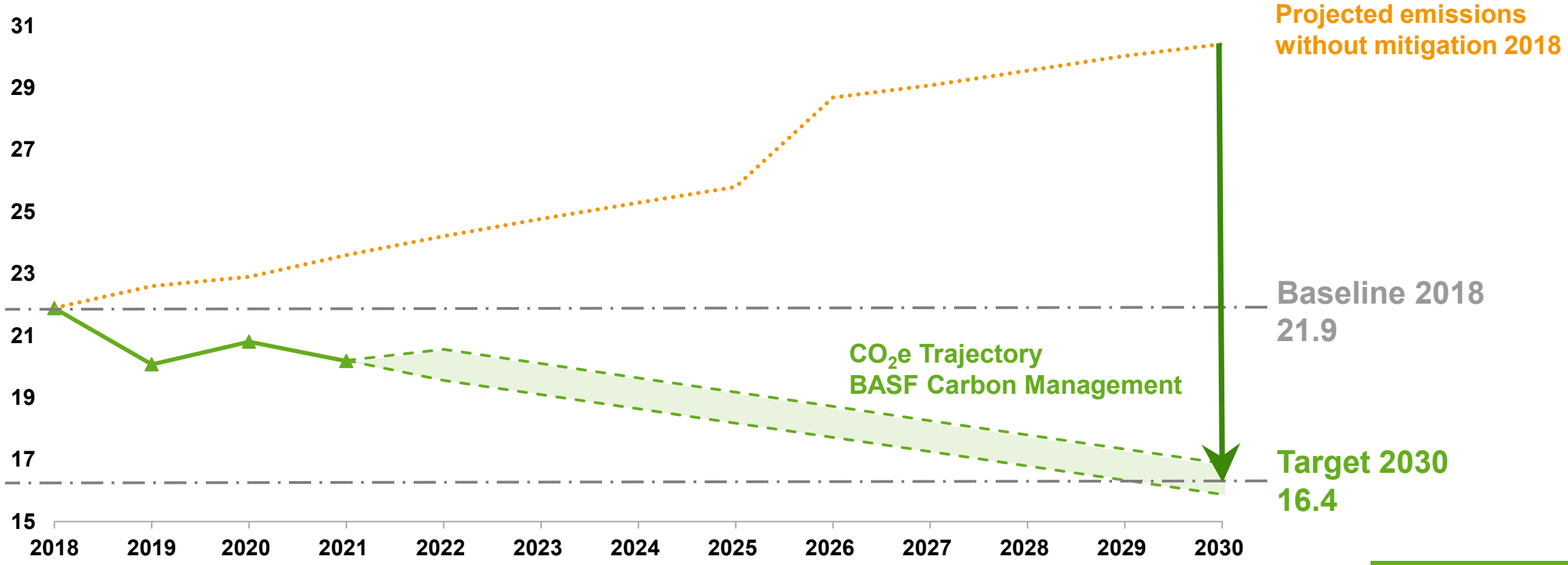
We have defined a corridor for reducing our emissions until 2030

Projected BASF greenhouse gas emissions
Million metric tons CO_2 equivalents



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Construction of offshore wind farm Hollandse Kust Zuid on track

Credit: Flying Focus BV

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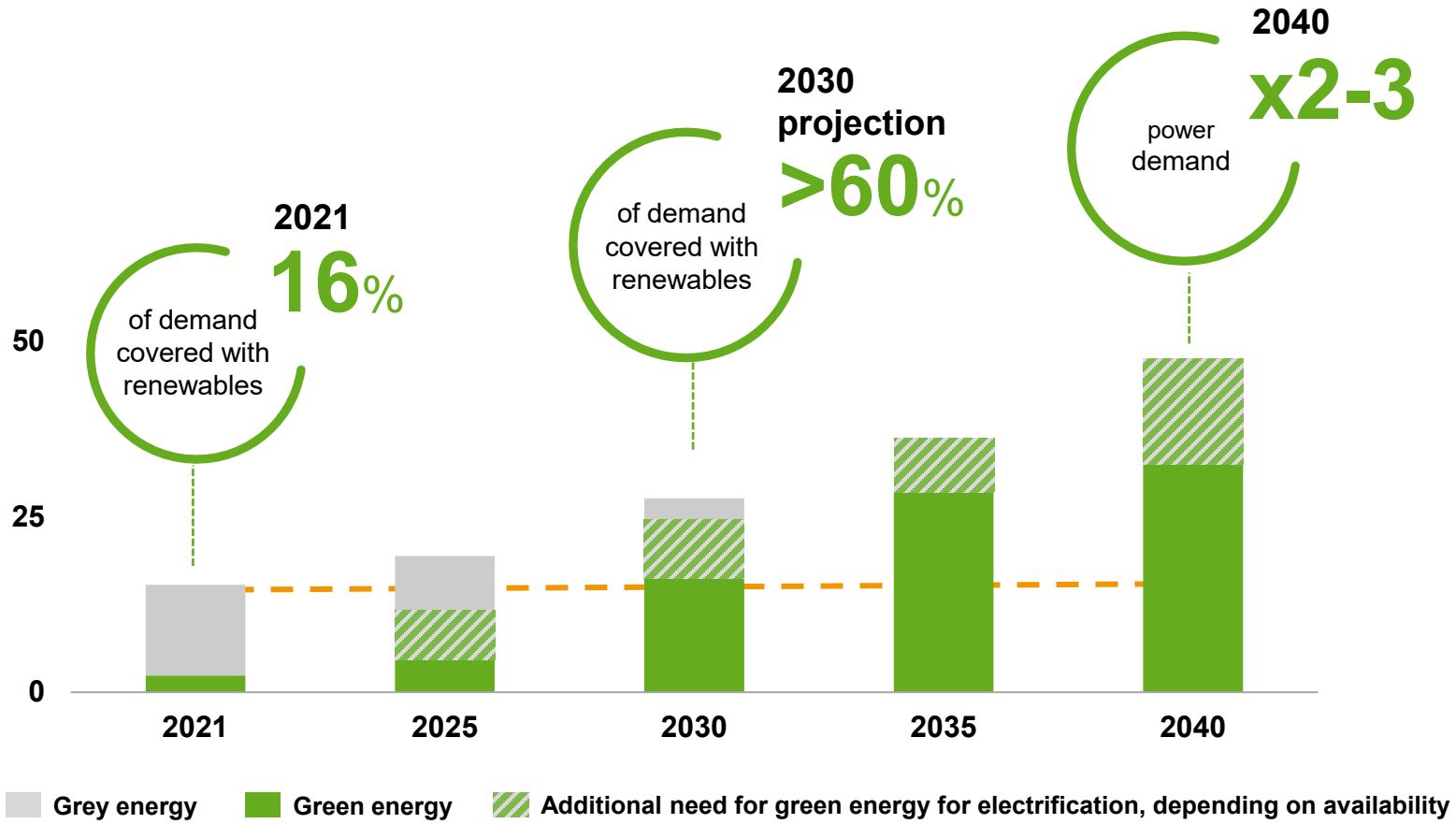
Switching our power to renewable energy will be the main driver of emission reduction until 2025

BASF global power demand and renewable supply projection

Terawatt hours



- 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**

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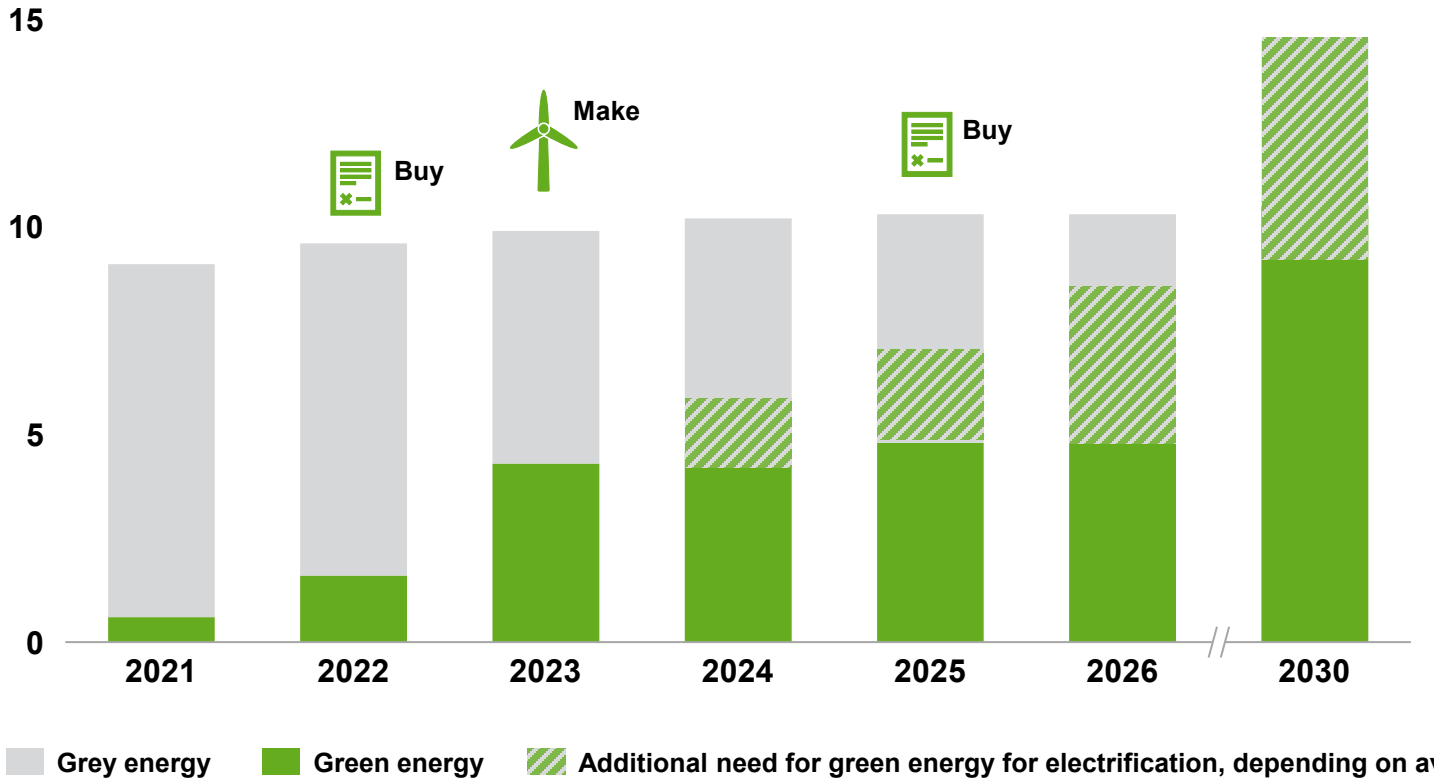
We are delivering with a pipeline of projects to secure supply of renewable energy at competitive prices

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

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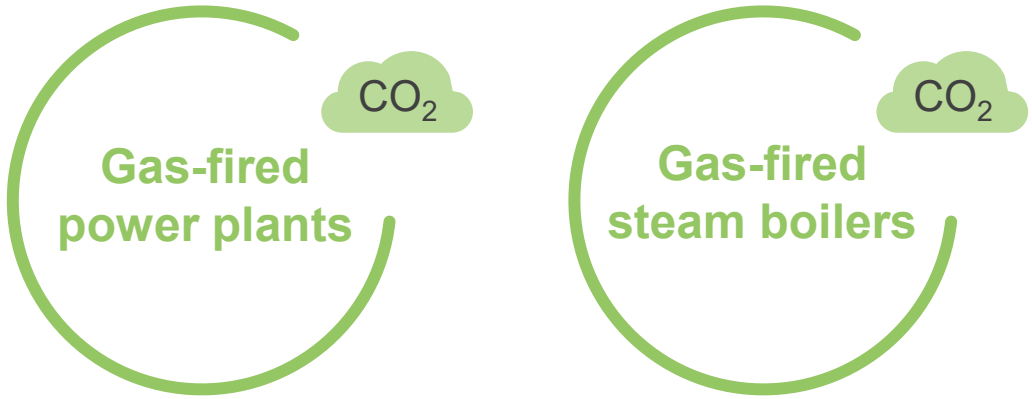
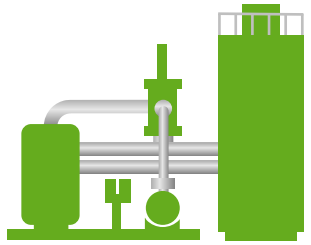
High potential from changing to power-to-steam allows decoupling from electricity supply

Current situation

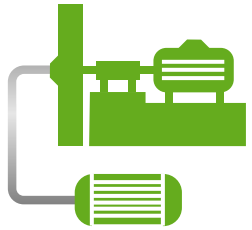


Fossil-based steam generation

Future situation



E-boilers



Heat pumps

E-drives

Electrification of steam generation and reduction of steam consumption

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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**

Potential to replace up to **1,100 tons per hour** of fossil-generated steam

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

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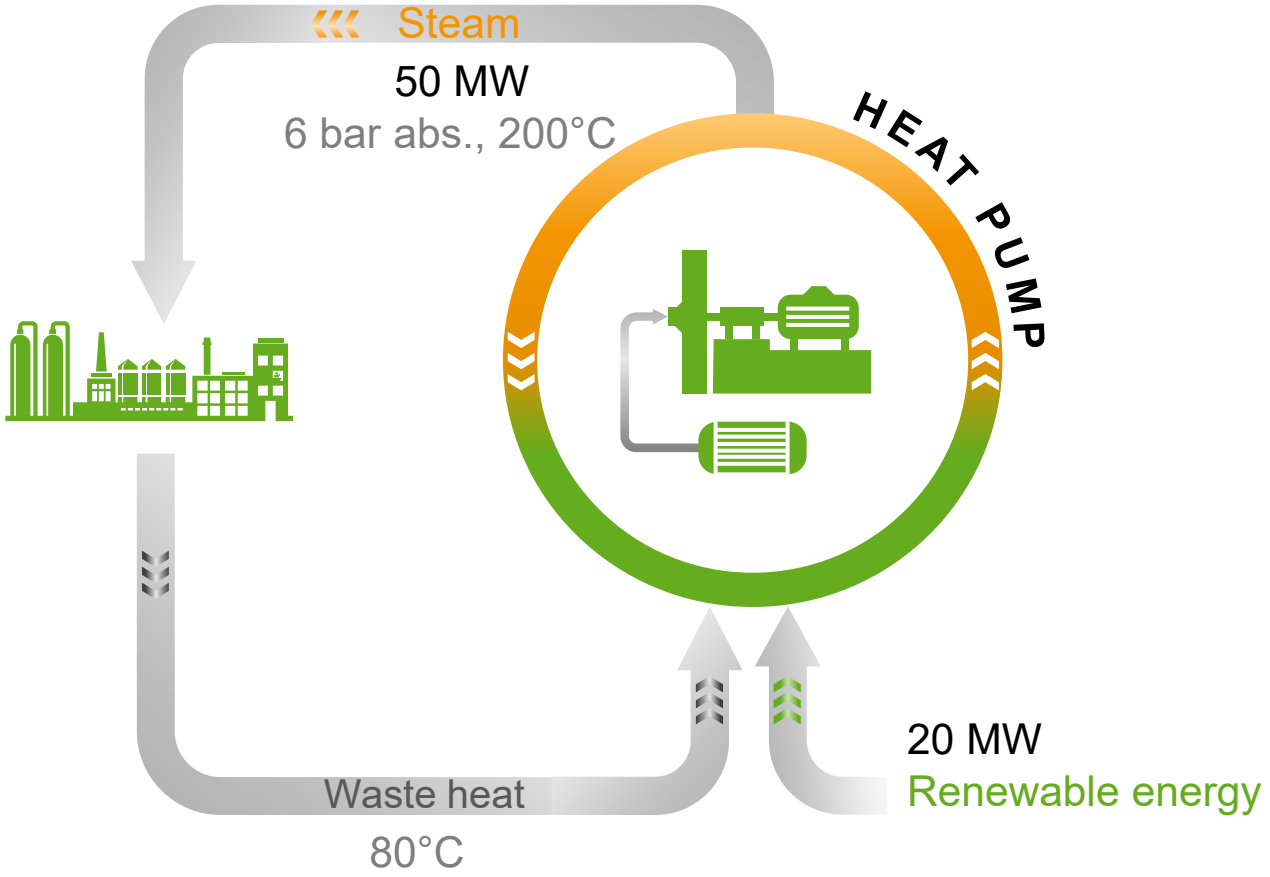
First high-temperature heat pump to supply steam to the BASF Verbund in Ludwigshafen



- **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 CO_2 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**

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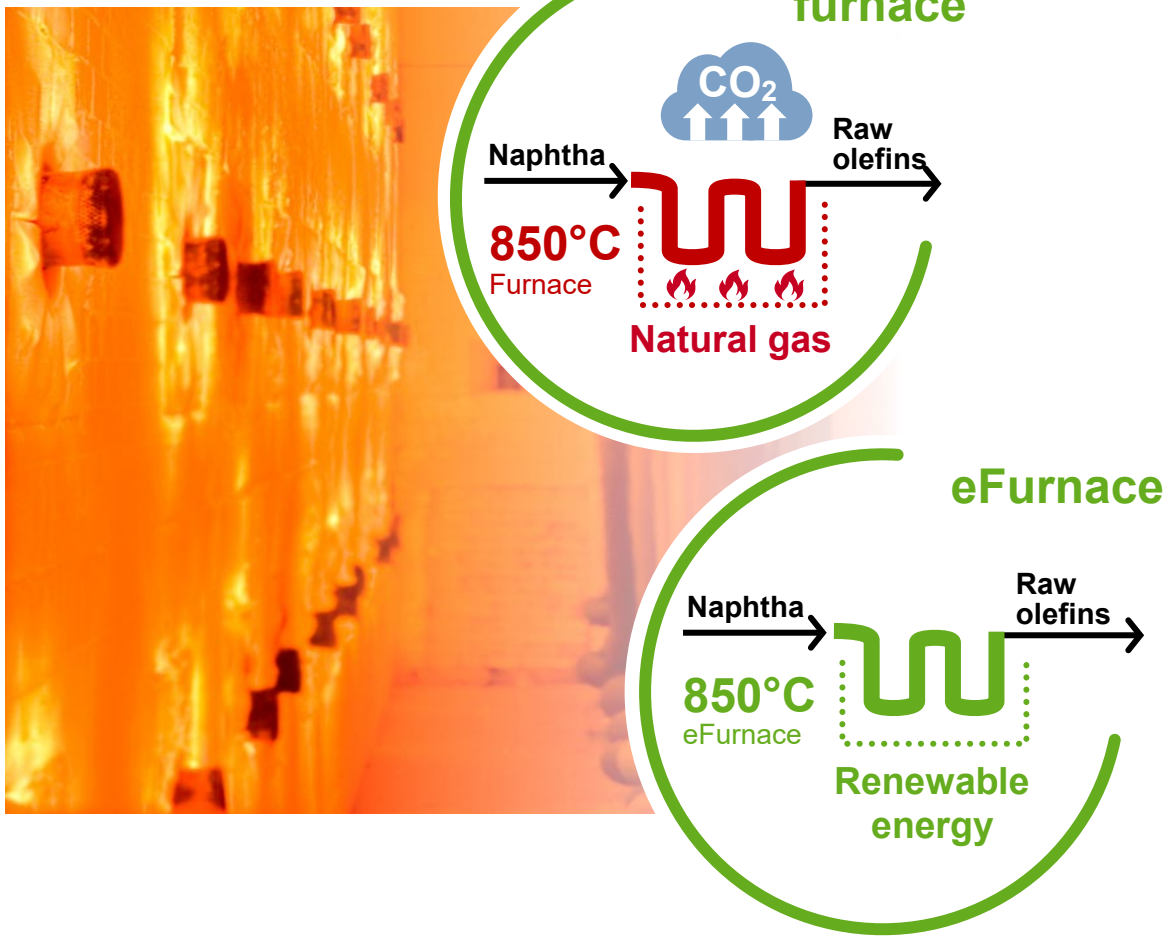
Preparations for the world's first electrically heated steam cracker furnace on track



- Goal is to scale up electrically heated steam cracker furnace concepts in **cooperation with Linde and SABIC**
- **Application for funding submitted** to Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
- Startup of the **pilot plant planned for 2023** subject to positive public funding decision

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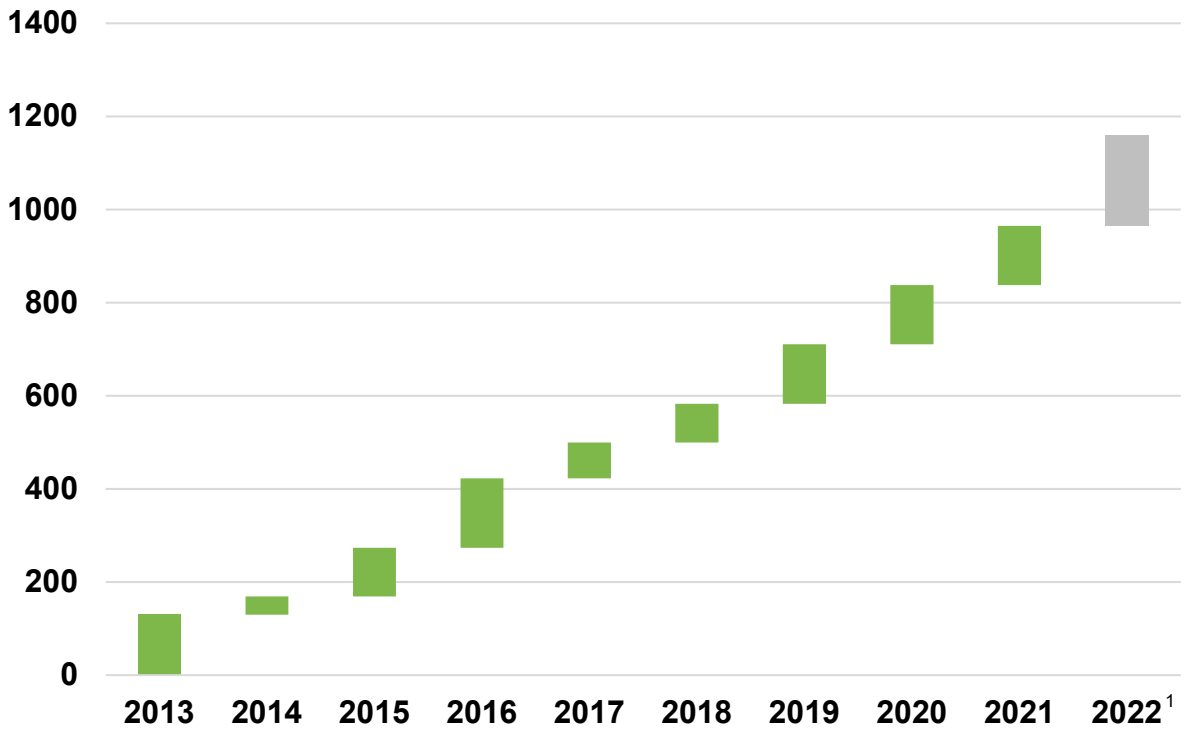
Operational excellence – a lever to continuously increase our energy efficiency and avoid CO_2 emissions

Reduction of CO_2 emissions through operational excellence measures
Kilo tons per year, cumulative



- Opex measures helped to **reduce CO_2 emissions by ~1 million tons** from 2013 to 2021
- In 2021, **~400 opex measures** were realized that reduced CO_2 emissions
- Examples:
  - Plant for plastics production **repurposed off-heat** to generate steam for other plants, equaling **~5,000 tons lower CO_2 emissions annually**
  - Further optimized process control in nitric acid cluster **avoids 145,000 tons of CO_2 equivalents per year**
- New process to foster **opex projects** linked to CO_2 emission reductions

[1] Forecast

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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

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Antwerp is BASF's second largest Verbund site worldwide

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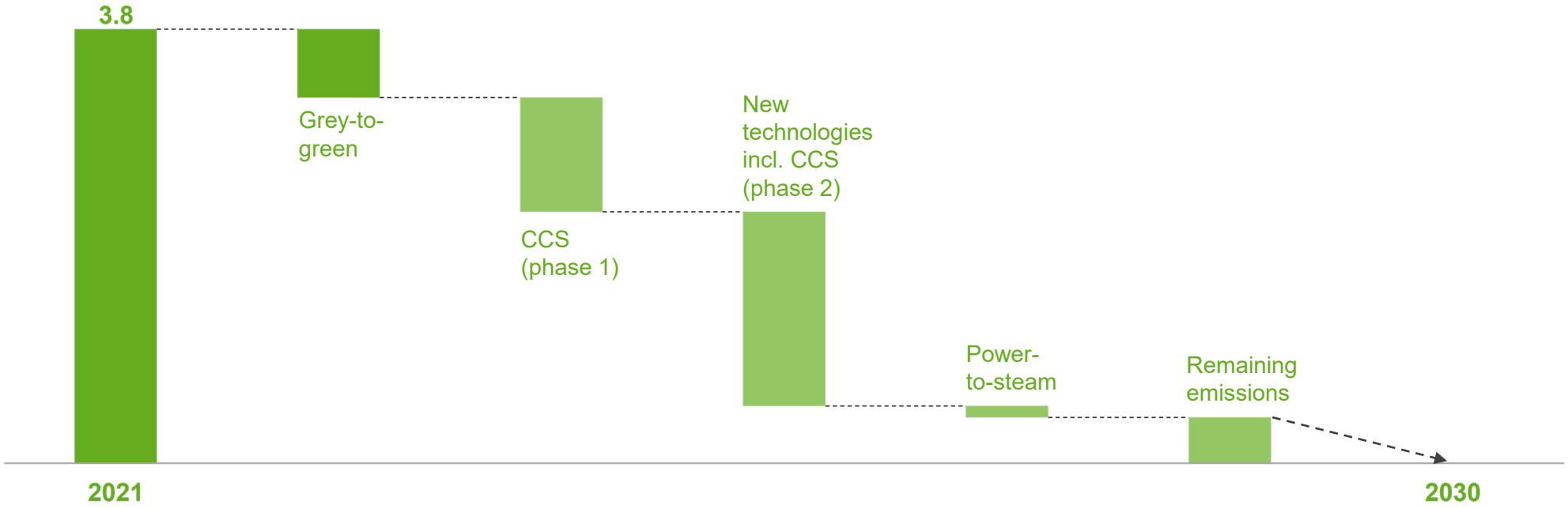
Antwerp Verbund site with the aspiration to be the first petrochemical site to approach net zero in 2030

Projected CO_2 emissions of BASF at Antwerp Verbund site[1]

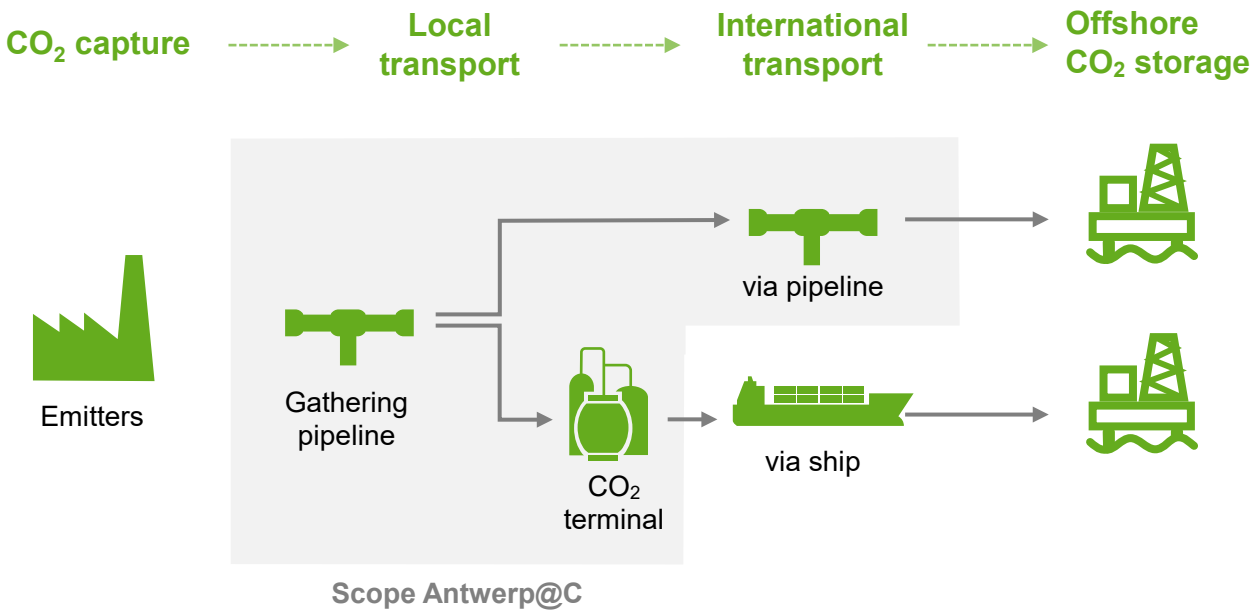
Million metric tons



[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

Full cross-border CCS value chain



- Project consortium **Antwerp@C** has entered the FEED phase for CO_2 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 CO_2 emissions in Antwerp by 1 million tons per year in a first step
- Planned to be **operational by 2025**

Co-funded by the European Union

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Zhanjiang to become BASF's third largest Verbund site worldwide

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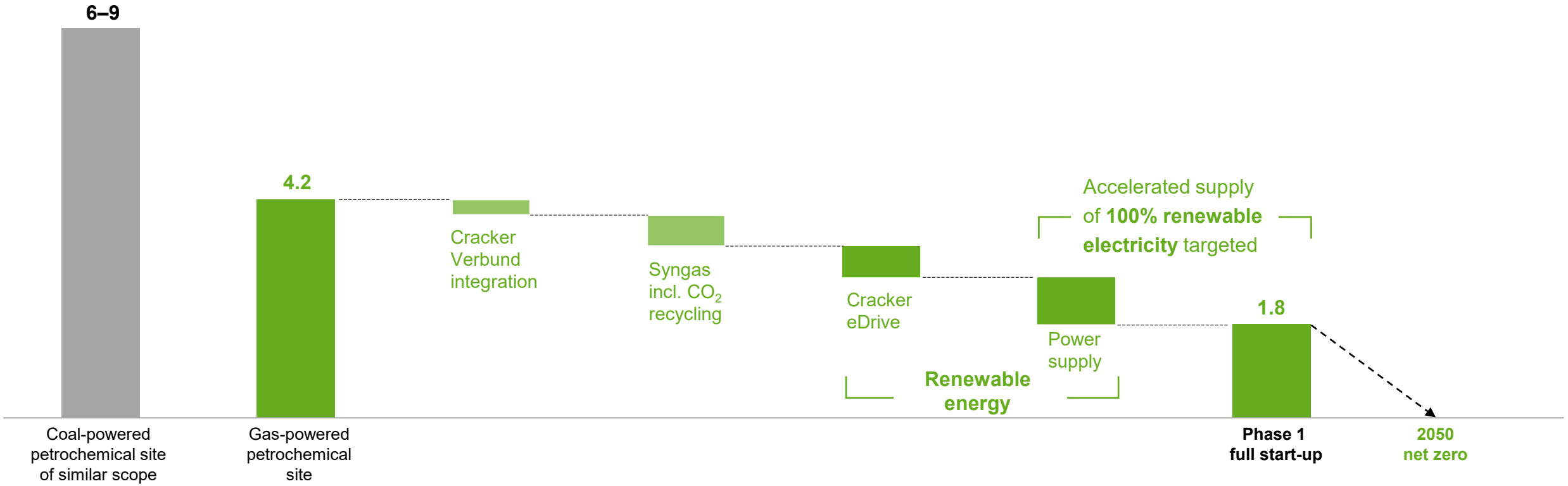
Verbund site Zhanjiang uses latest technologies to reduce CO_2 footprint compared with standard gas-powered petrochemical site

Projected CO_2 emissions of BASF at Verbund site in South China

Million metric tons



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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 **CO_2 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 CO_2 emissions**

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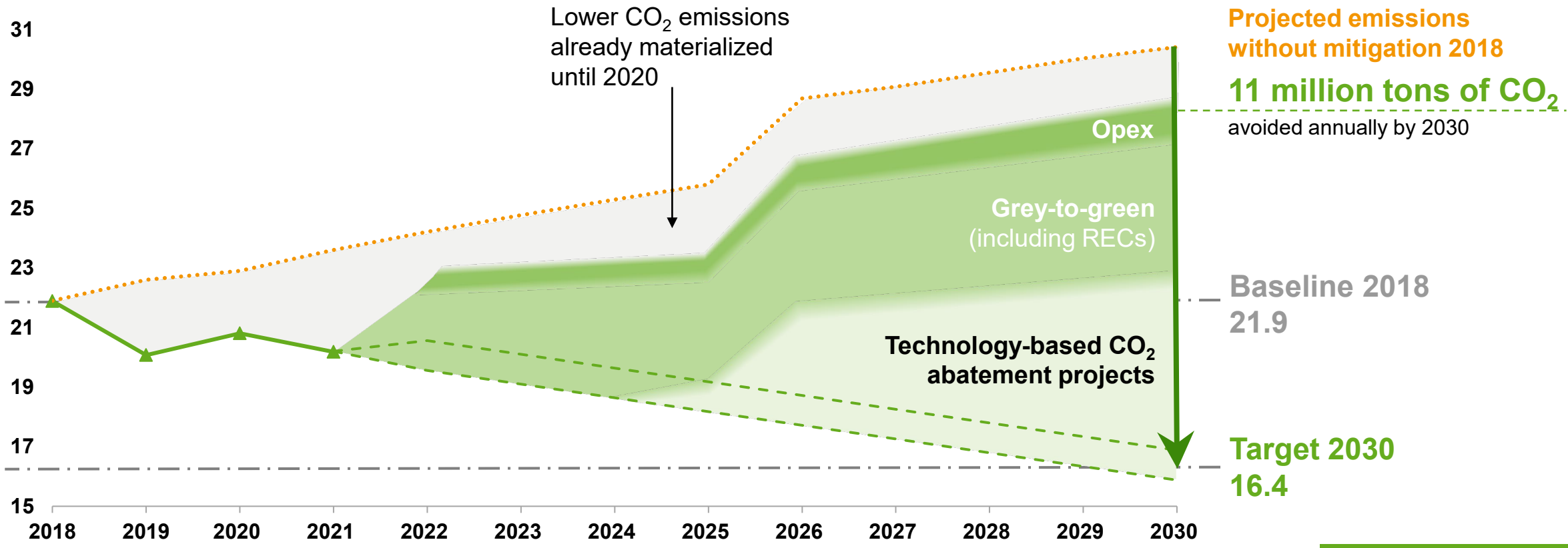
Our roadmap is backed by robust calculations and solid planning

Projected BASF greenhouse gas emissions

Million metric tons CO_2 equivalents



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Structured approach to capex spending

Current project pipeline and projected capex

Pilot scale

- eFurnace: Engineering and construction[1] → Pilot furnace → First commercial furnace → Global roll-out
- Water electrolysis: Engineering and construction[1] → Operation
- Methane pyrolysis: Trial reactor → Pilot engineering and construction → Pilot operation → Global roll-out

Commercial scale

- CCS: Implementation and operation
- Heat pumps: Implementation and operation
- E-boilers & e-drives: Implementation and operation

Operational excellence

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

[1] Depending on public funding

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Agenda

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3. **Profitable growth with net-zero and low-PCF products**

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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

[1] CO_2e emissions (cradle-to-gate), calculated using a McKinsey methodology for analysis

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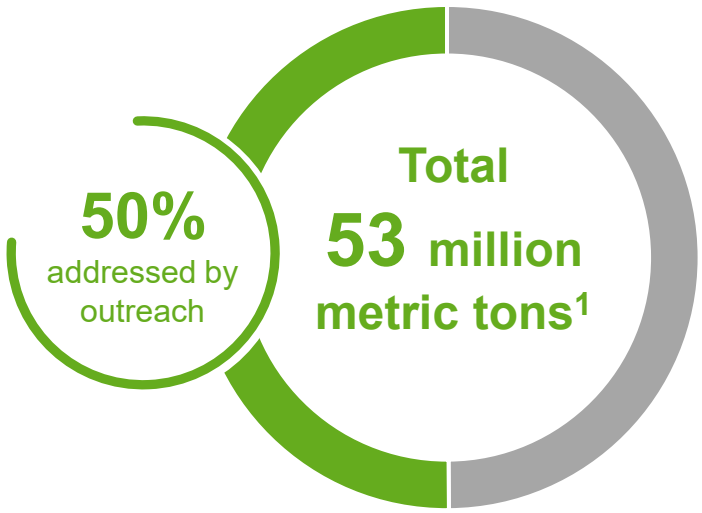
We create transparency on the CO_2 emissions of our raw materials as an important step in reducing BASF's Scope 3 emissions

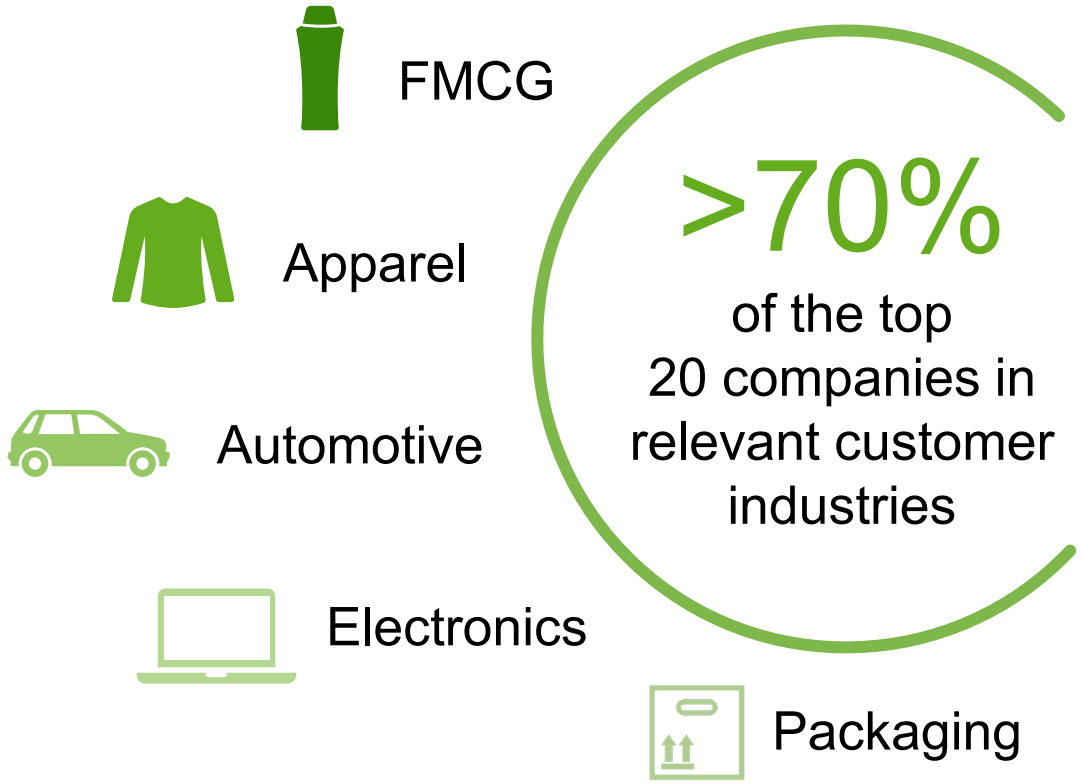
BASF's CO_2e emissions from raw material purchase 2021



- 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_2e, 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



had **committed to CO_2 emission reduction targets**[1] by 2021;

almost half have defined **Scope 3 emission targets**

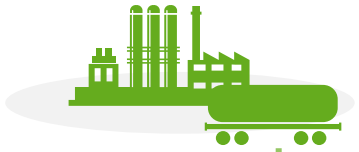
First movers in decarbonization set to profit from strong market pull for low-PCF products

[1] Source: CapIQ, Science-Based Targets Initiative, CDP Worldwide, McKinsey ESG Solutions / Sustainability Insights. 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



Scope 1 + 2

Emissions caused by own operations[1]

- TÜV-certified[2]
- Meets ISO standards[3]
- Calculates product carbon footprints cradle-to-gate

CO_2

Product carbon footprints of sales products

Customer benefits

- Transparency on CO_2 emissions
- Identification of main reduction levers
- Certified software
- Transparent documentation

[1] Energy generation and chemical processes
[2] ISO 14067:2018
[3] ISO 14040:2006, 14044:2006, 14067:2018, GHG Protocol Product Standard

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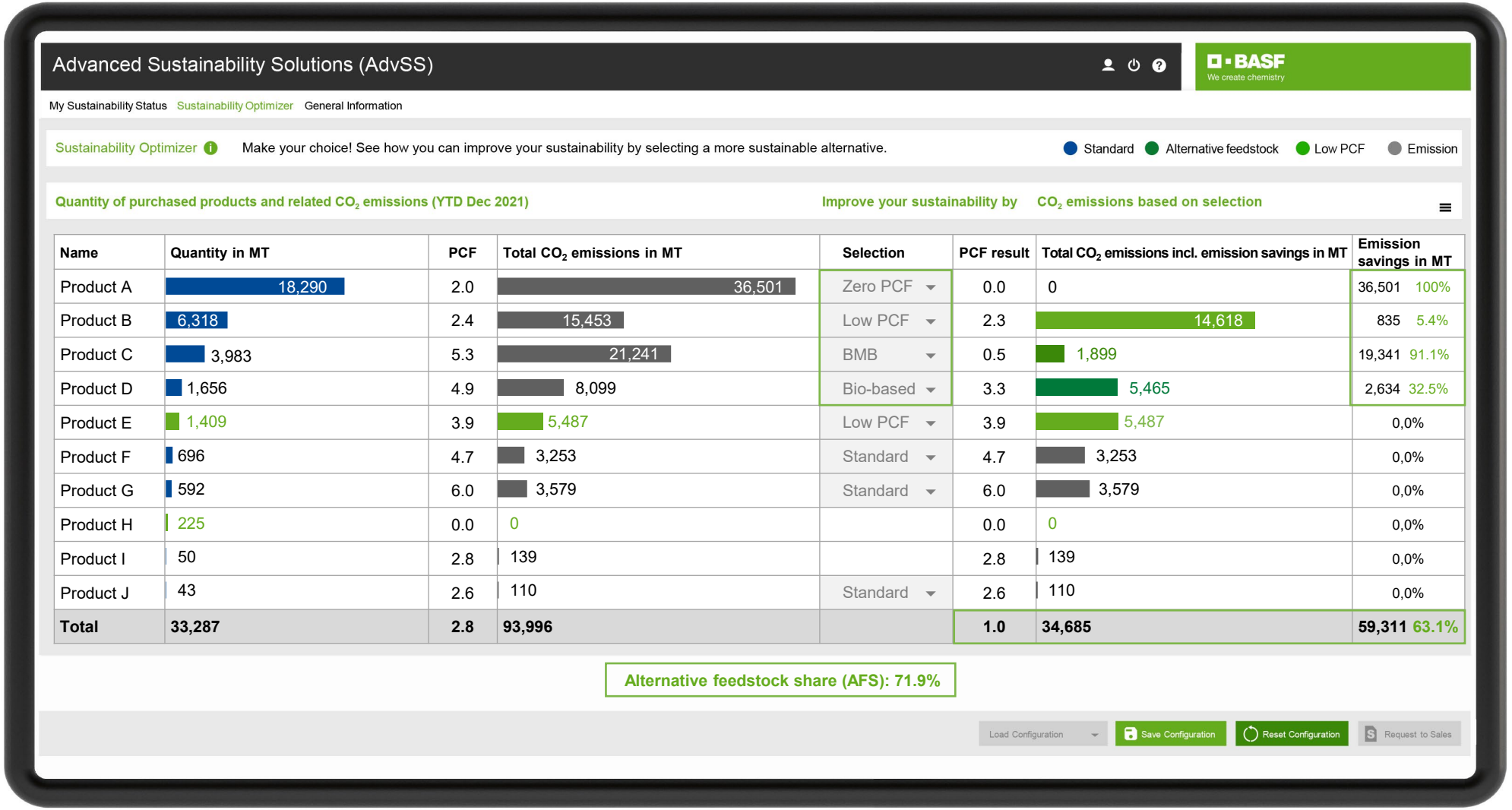
We help our customers to reduce their CO_2 footprints



Name	Quantity in MT	PCF	Total CO_2 emissions in MT	Selection	PCF result	Total CO_2 emissions incl. emission savings in MT	Emission savings in MT
Product A	18,290	2.0	36,501	Zero PCF	0.0	0	36,501 100%
Product B	6,318	2.4	15,453	Low PCF	2.3	14,618	835 5.4%
Product C	3,983	5.3	21,241	BMB	0.5	1,899	19,341 91.1%
Product D	1,656	4.9	8,099	Bio-based	3.3	5,465	2,634 32.5%
Product E	1,409	3.9	5,487	Low PCF	3.9	5,487	0,0%
Product F	696	4.7	3,253	Standard	4.7	3,253	0,0%
Product G	592	6.0	3,579	Standard	6.0	3,579	0,0%
Product H	225	0.0	0		0.0	0	0,0%
Product I	50	2.8	139		2.8	139	0,0%
Product J	43	2.6	110	Standard	2.6	110	0,0%
Total	**33,287**	**2.8**	**93,996**		**1.0**	**34,685**	**59,311 63.1%**

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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 CO_2 emissions** in total

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BASF and Henkel are making a significant joint commitment for a sustainable future

Henkel

"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

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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_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 CO_2 emissions can be reduced significantly** with a limited number of measures
- The scale of our Verbund sites allows **lower specific capex for CO_2 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

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