BASF's Roadmap to Net Zero

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Commercial & Market Development Director

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Agenda

1. Introduction: Brief Info for BASF
2. Sustainability @ BASF
3. Sustainable solutions in Isocyanates and Precursors

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BASF Global Facts and Figures

~ 111,991
Employees
as of December 31, 2023

Global Know-How Verbund with external partners

Global expenditures for R&D:

€2.1 billion

world leader in the chemical industry

6 Verbund sites

234 production sites

€68.9 billion
Sales 2023

Our success factors:

– Customer focus
– Digitalization
– Creativity
– Efficiency
– Collaboration with external partners

BASF Turkey Facts and Figures

3
Production sites

8
Offices

4
Legal Entities

1
Innovation and Technology Center

1
Breeding Center

11
Locally Represented Operational Divisions

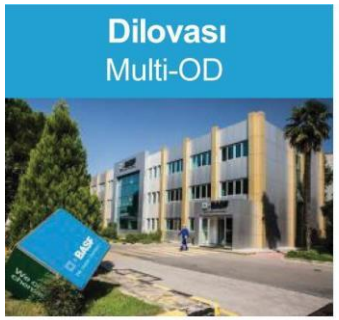
738
Employees

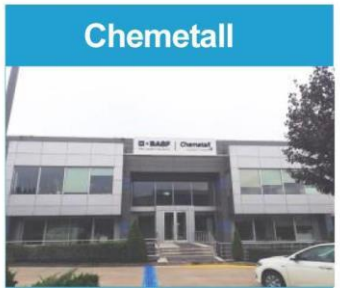
41
Employees work in lab

~ €1billion
Sales achieved
in 2023

~ %30
Sustainability product sales

~2000
Customer





Our customers in different industries face diverse challenges – Chemistry is key to solving these challenges


Agriculture


Health & Nutrition


Energy & Resources


Consumer Goods


Transportation


Electrical & Electronics


Construction & Housing

Chemistry as enabler to meet current and future needs

The world by 2050

~10 billion people

70% of the world population will live in cities

35% more primary energy consumption

30% more food needed

BASF Global Sustainability Targets

Our contribution to a climate-neutral future

2030

25%

Scope 1 and Scope 2
CO_2 emissions reduction
(compared with 2018)

15%

specific **Scope 3.1**
CO_2 emission reduction
(compared with 2022)*

2050

Net zero
CO_2 emissions

Carbon Management

Investments of up to **€4 billion** by **2030** with detailed roadmap focusing on **five strategic levers**

- Grey-to-green
- Power-to-steam
- New technologies
- Bio-based feedstocks
- Continuous opex

Renewable Energy

BASF aims to source **more than 60%** of its power needs from **renewable sources** by **2030**

Circular Economy

We aim at doubling our circular sales to reach **€17 billion** by **2030**.

[1] Corresponds to a reduction from 1.57 to 1.34 kilograms of CO2e per kilogram of raw material bought; calculated on the basis of relevant Scope 3.1 emissions of 48 million metric tons

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Carbon Management

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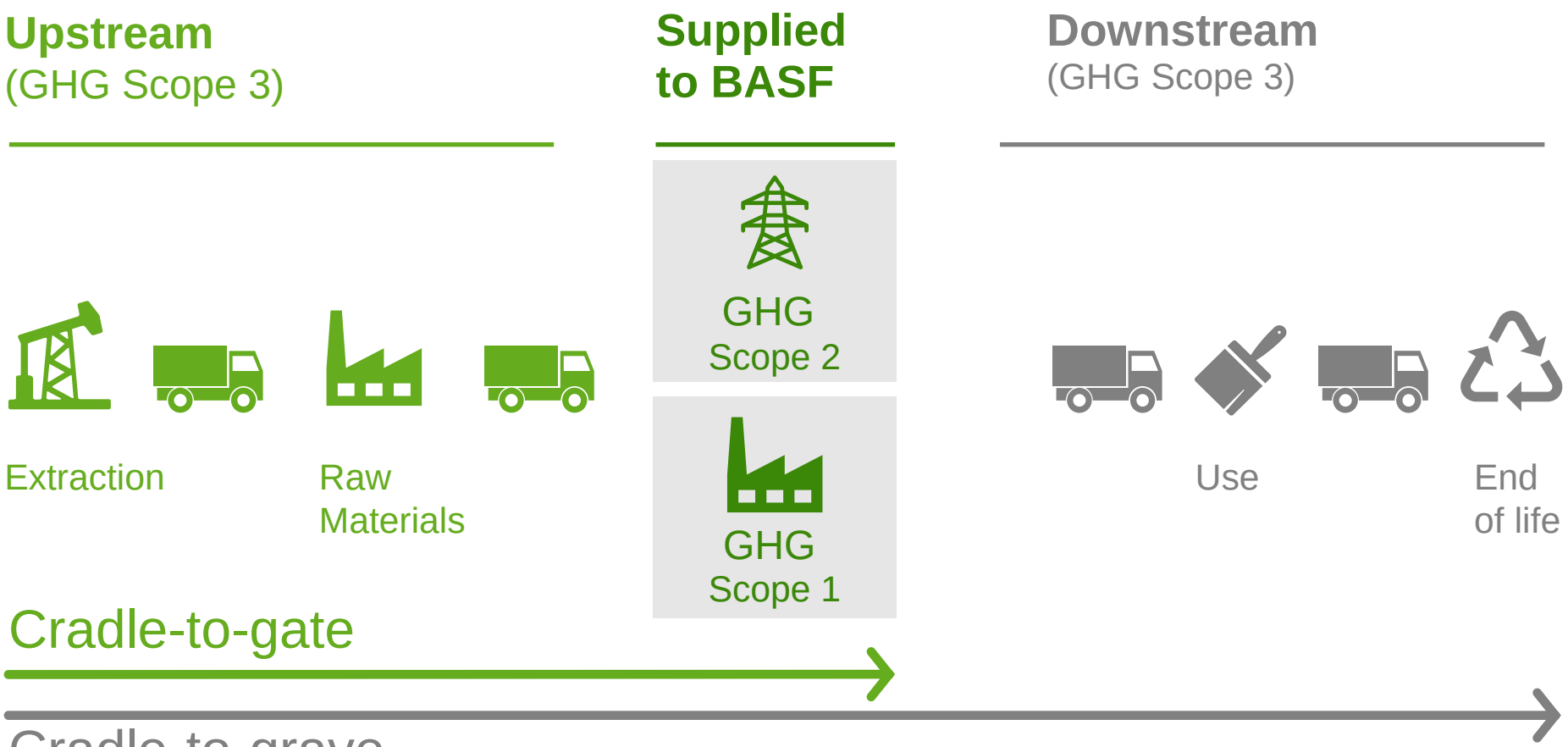
We provide Product Carbon Footprints (PCF)

Upstream (GHG Scope 3)



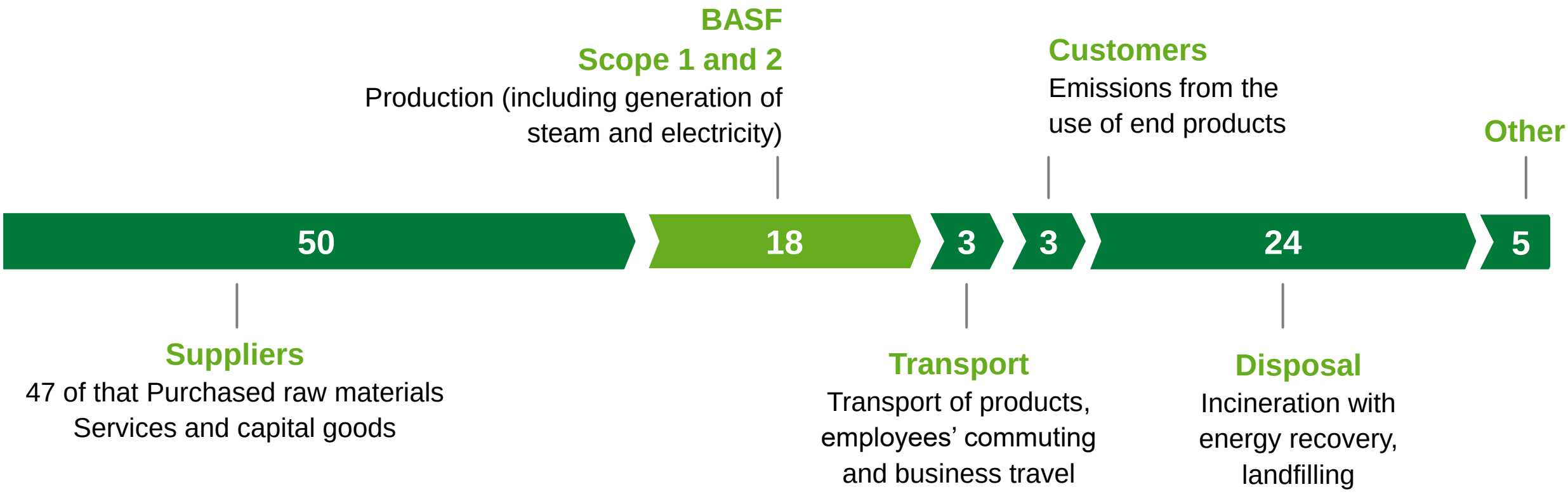
- The PCF is a way to measure the climate impact of a product
- It summarizes the total amount of greenhouse gas (GHG) emissions that is associated from cradle to BASF factory gate
- This includes: Scope 1, Scope 2 **and upstream** Scope 3 emissions

ISO 14067:2018 defines the Product Carbon Footprint as the life cycle GHG emissions of a product

We assume responsibility along the entire value chain

Greenhouse gas emissions along the BASF value chain in 2023[1]

(in million metric tons of CO_2 equivalents)



[1] More on Scope 3 emissions reporting at basf.com/CO2-balance

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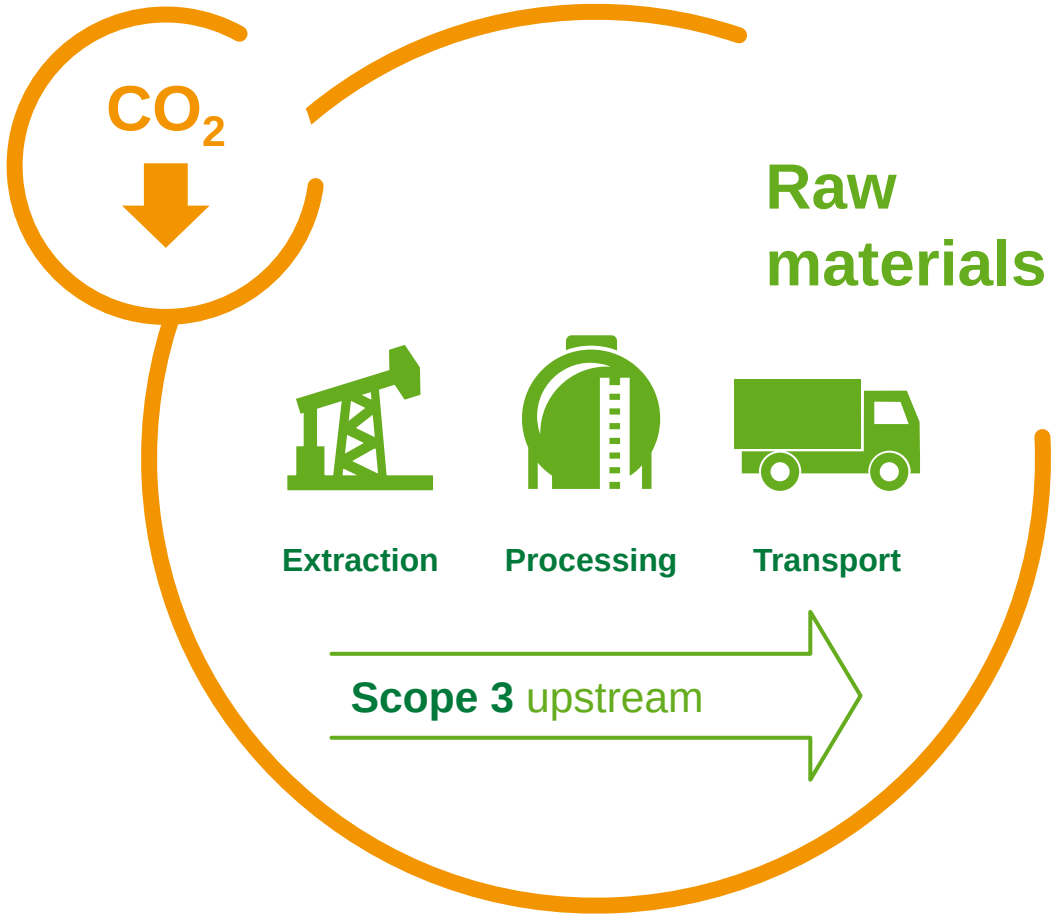
What we expect from our suppliers: Transparency on and reduction of CO_2 emissions

- BASF is establishing certified, product-level CO_2 transparency for its customers and is engaging its suppliers
- To support its suppliers and the industry, BASF shares its knowledge to create an international standard for the calculation of CO_2 transparency tools
- BASF works together with its suppliers and expects them to reduce the CO_2 footprint of their products



BASF will work all levers to reduce CO_2 emissions

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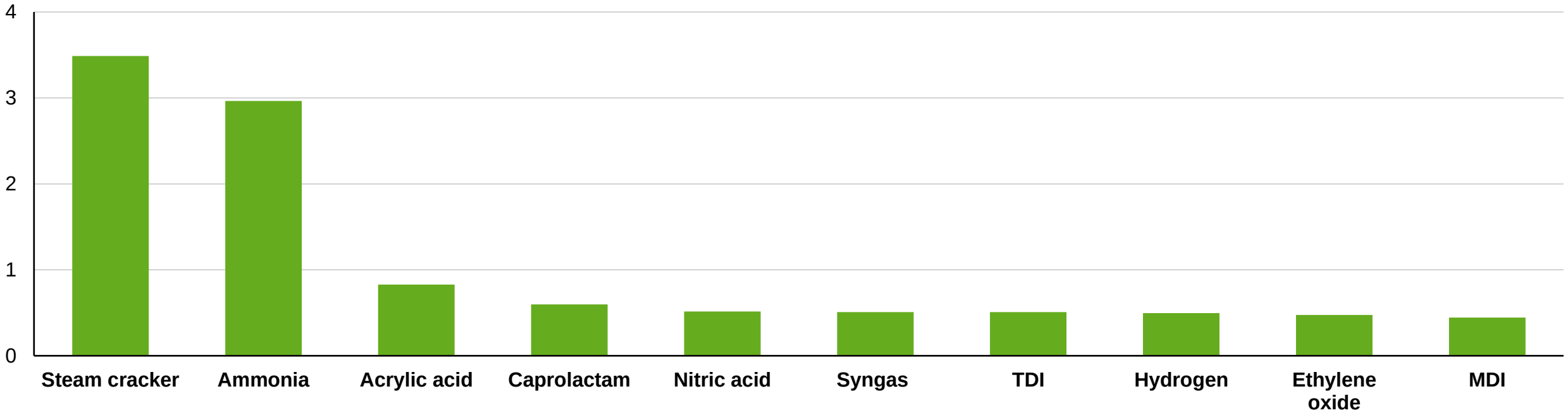
Ten base chemical technologies cause the majority of BASF's emissions

Greenhouse gas emission profile of BASF technologies

Energy and chemistry emissions, million metric tons per year*



BASF has identified its CO_2-intensive processes and is addressing them.

* Based on nameplate capacities, excluding emissions from B companies

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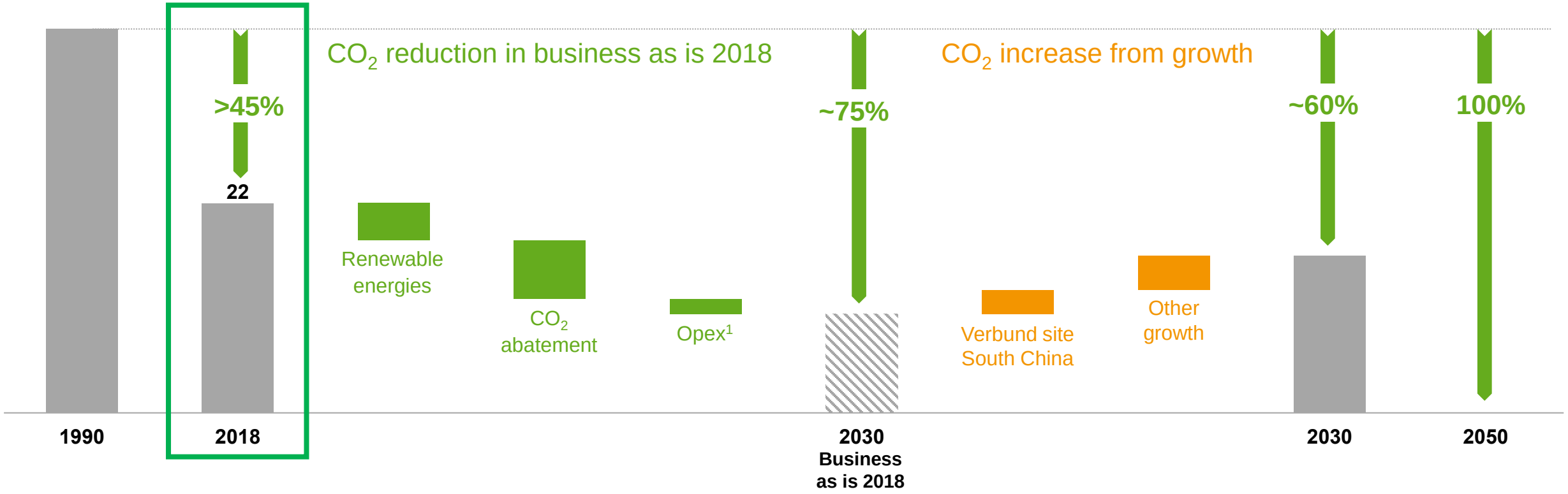
▪ Internal

Our path to reduce BASF emissions from 1990 to 2050

BASF greenhouse gas emissions (Scope 1 and Scope 2) 1990-2050

Million metric tons



[1] Operational excellence measures that count towards either renewable energies or CO_2 abatement.

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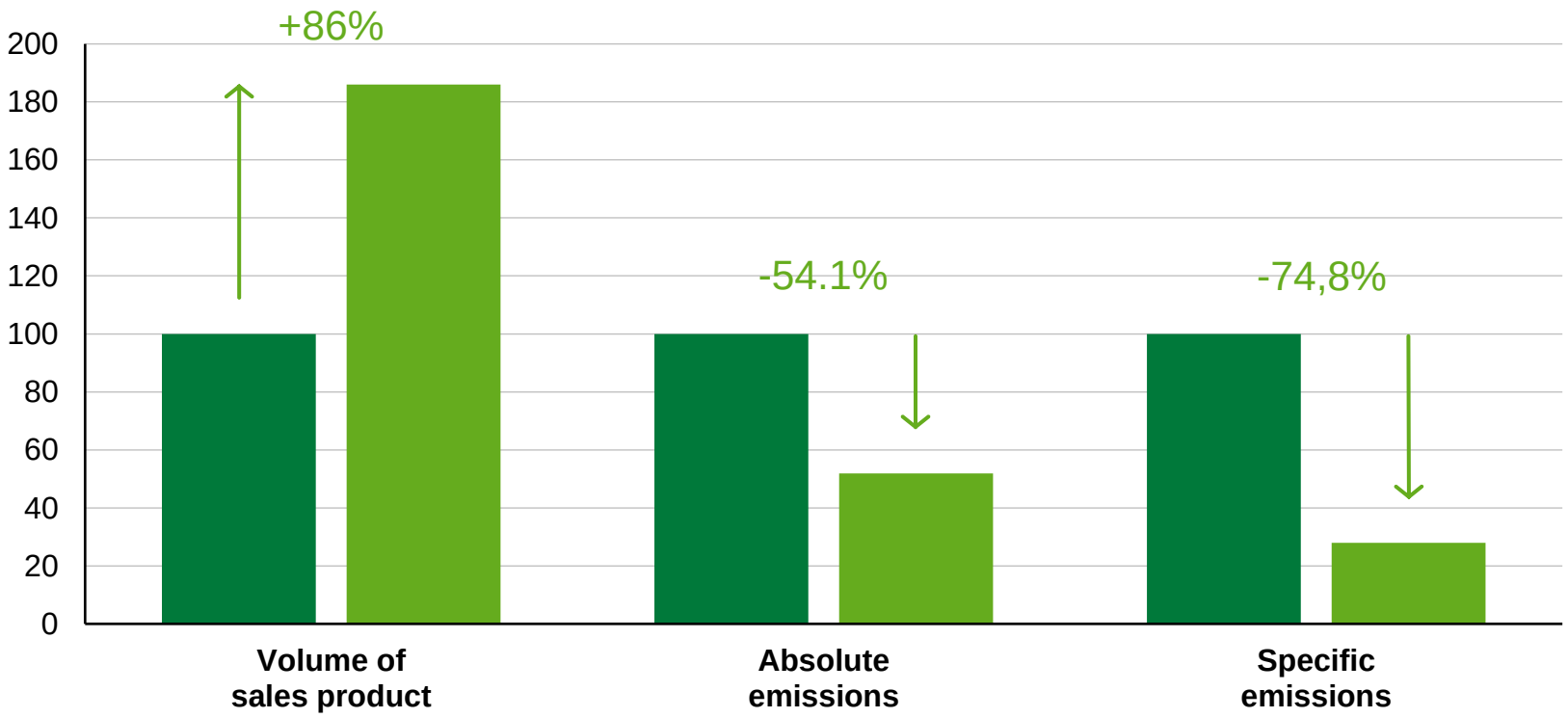
Reduction of greenhouse gas emissions with increased production

Development since 1990

Index 1990 = 100%



- Since 1997 we have been using proprietary catalysts in our plants that decompose the greenhouse gas nitrous oxide (N_2O)
- We generate electricity and steam in highly-efficient combined heat and power (CHP) plants
- We continuously improve the energy efficiency of our processes and in our Verbund system
- We shift our energy supply to renewable sources

We are making progress on technologies for carbon abatement

eFurnace

eFurnace[1] demonstration plant built in Ludwigshafen with SABIC and Linde; testing of heating concepts to start in Q2 2024

Supported by: Federal Ministry for Economic Affairs and Climate Action; on the basis of a decision by the German Bundestag; Funded by the European Union NextGenerationEU

Water electrolysis

Positive funding decision for 54 MW **water electrolysis**[2] plant in Ludwigshafen (Hy4Chem-EI) granted in November 2023; startup planned in 2025

Supported by: Federal Ministry for Economic Affairs and Climate Action; on the basis of a decision by the German Bundestag; RheinlandPfalz MINISTERIUM FÜR KLIMASCHUTZ, UMWELT, ENERGIE UND MOBILITÄT

CCS projects

BASF and Yara evaluating world-scale **blue ammonia** project using **CCS** in the United States[3]

CCS project to reduce BASF's CO_2 emissions in Antwerp by 1 million tons per year slated for startup in 2027

Co-funded by the European Union

[1] Supported by the Federal Ministry for Economic Affairs and Climate Action (BMWK) and funded by the European Union
[2] Supported by the Federal Ministry for Economic Affairs and Climate Action (BMWK) and the State of Rhineland-Palatinate
[3] Total capacity 1.2 to 1.4 million tons p.a.

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

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

TÜVRheinland® CERTIFIED
Product Carbon Footprint
Certified Calculation Method
www.tuv.com
ID 0000080389

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Renewable Energy

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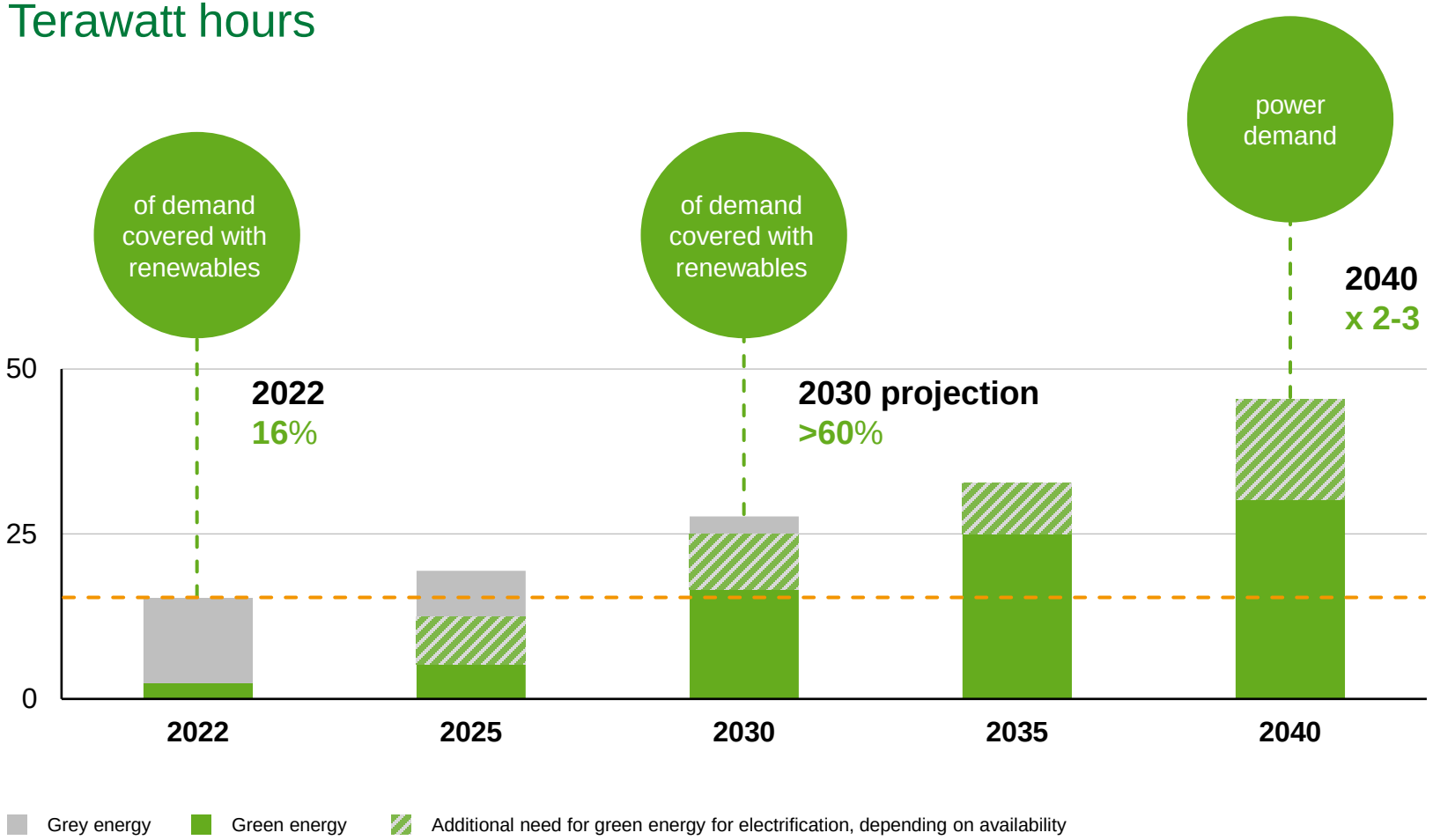
Switching our power to renewable energy will be the main driver of emission reduction until 2025

BASF global power demand and renewable supply projection

Terawatt hours



- BASF aims to source **more than 60%** of its power needs from **renewable sources** 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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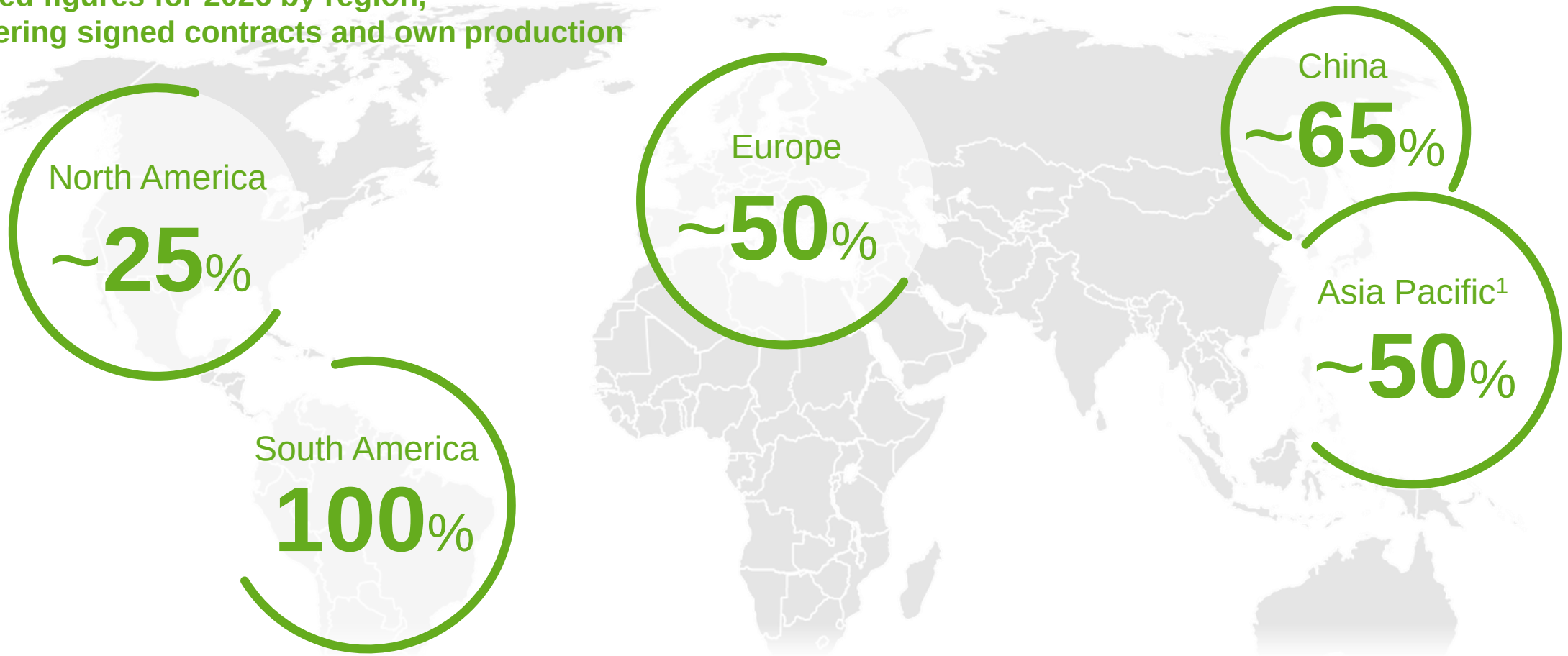
On track to reaching at least 60% renewable electricity worldwide by 2030

Projected figures for 2026 by region, considering signed contracts and own production



[1] Including China

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BASF drives forward renewable energy projects across the globe

Hollandse Kust Zuid –
world's largest wind park

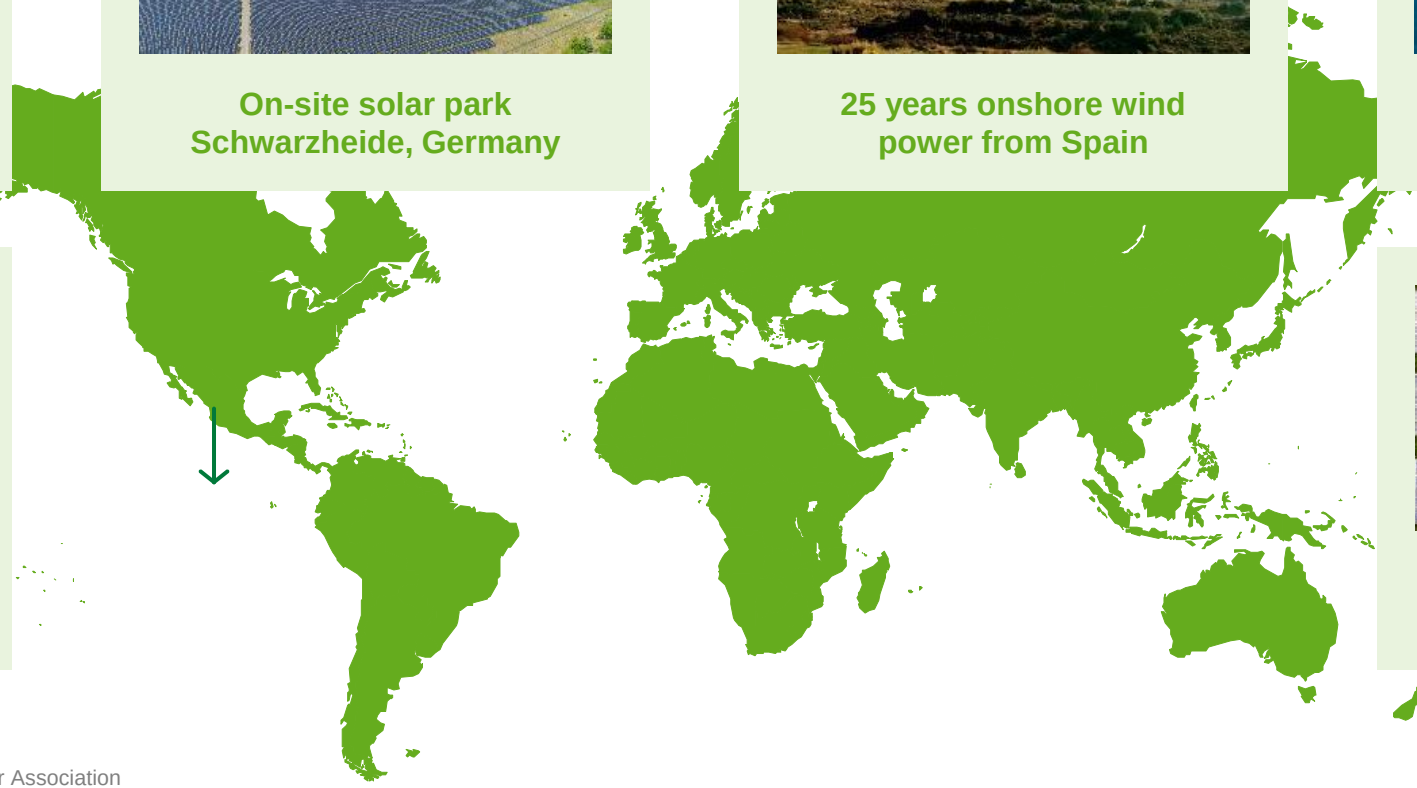
On-site solar park
Schwarzheide, Germany

25 years onshore wind
power from Spain

25 years offshore wind
power from Germany

Wind and solar power
for sites across US

Renewable power for
several Chinese sites



Picture sources: BASF, American Public Power Association

Circular Economy

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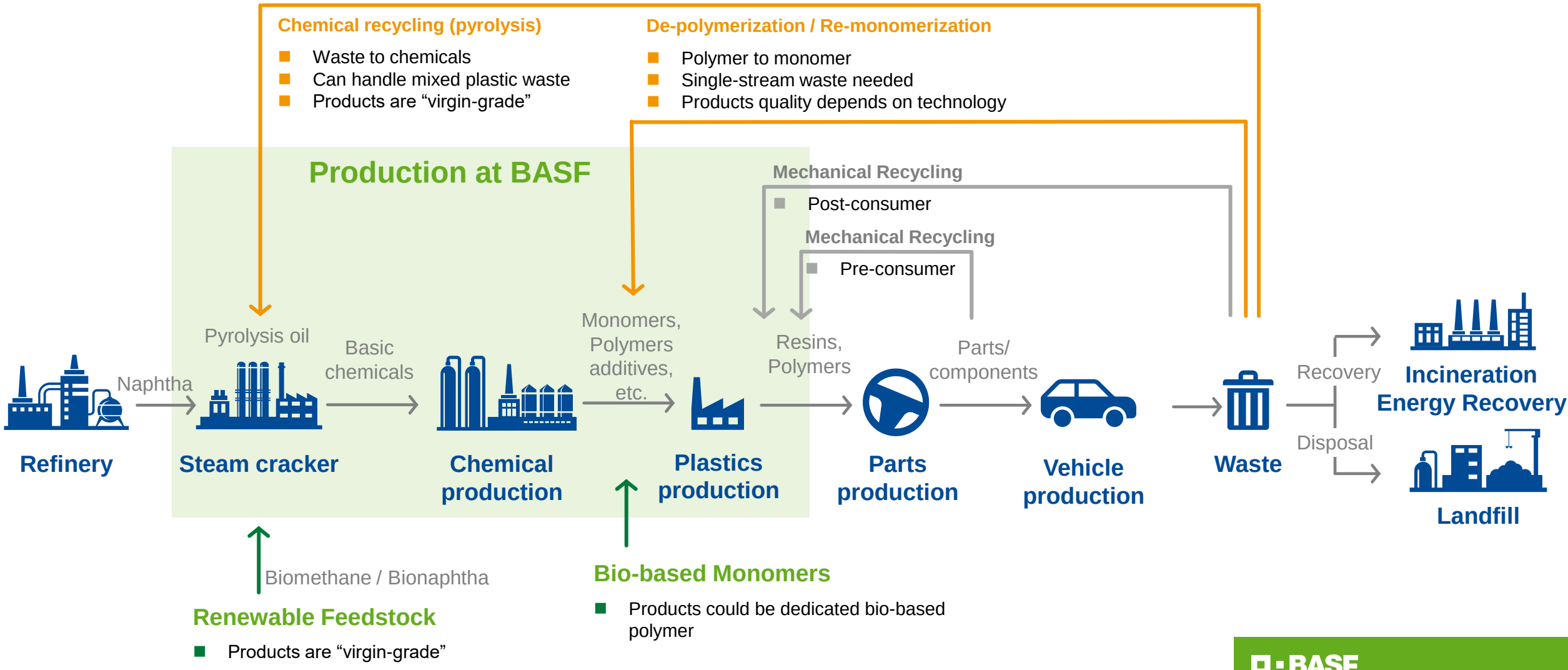
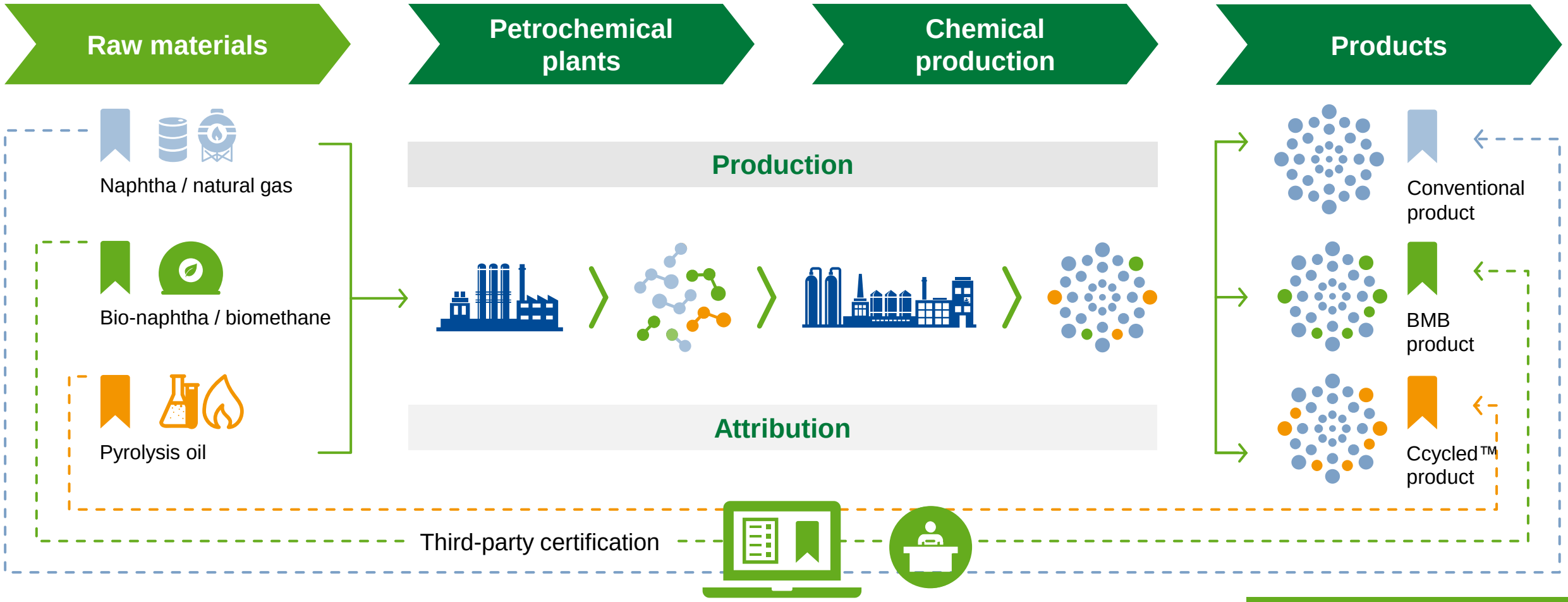
Transition from Linear to Circular Economy



The alternative feedstock is attributed through the mass balance approach (credit method)



By using alternative raw materials, we can manufacture the same products in a more sustainable way

Renewable feedstock

Dedicated bio-based portfolio

Sustainably sourced resources,
e.g. RSPO certified palm

Biomass Balance portfolio

Derived from biomass,
e.g., biomethane derived from organic waste, crops or vegetable oils

Recycled feedstock

e.g. ChemCycling™

Derived from post-consumer plastic waste or tires

Sustainable Products in Isocyanates and Precursors

Isocyanates & Polyols

MDI | TDI | Propylene Oxide | Polyols

Inorganic Chemicals

Basic chemicals | Technical salts | Food additives | Bleaching agents | Standard alcoholates

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Isocyanates and Precursors Europe
Our sustainability approach

CO_2 reduction

We lower CO_2 emissions by prioritizing OpEx measures

Circular economy

We aim to offer a certified circular option in every major product line by 2025

Sustainable solutions

70% of our products are also available in more sustainable product alternatives

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Sustainable product portfolio

Conventional / LowPCF

- Lower carbon footprint compared to global/ regional market average
- Consistent quality and specifications

Biomass Balance (BMBcert)

- Renewable content
- Derived from residues of biomass, agricultural production or food processing, crops

ChemCycling® (Ccycled)

- Recycled feedstock
- Derived from post-consumer plastic waste or end-of-life tires

ZERO (Zero Emission, Renewable Origin)

- First MDI with net Zero CO_2 emissions
- Dedicated bio-based portfolio based on sustainably sourced resources
- Production based on green energy sources

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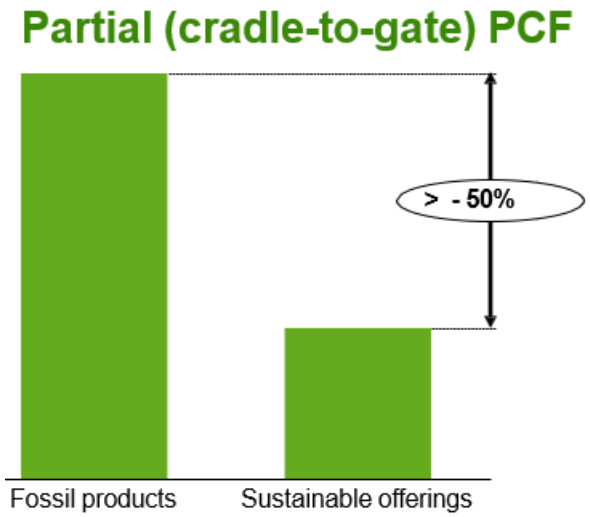
Reducing CO2 Footprint

	Lower CO_2 Footprint[1]	Recycled Feedstock	Renewable Feedstock	Biobased Feedstock
ChemCycled®	✓	✓		
Biomass Balanced	✓		✓	✓



Fossil based	Biomass Balanced	ChemCycled
MDI	MDI BMBcert™ MDI Zero™	MDI Ccycled® post C2
TDI	TDI BMBcert™	TDI Ccycled® post C2
Polyol	Polyol BMBcert™	Polyol Ccycled® post C2

1) Compared to fossil feedstock-based products

first greenhouse gas neutral aromatic isocyanate | Cradle-to-Gate Product Carbon Footprint (PCF) of zero | no offset of certificates | renewable raw materials used at the beginning of the chemical production chain and allocated via a mass balance process | renewable energies for the manufacturing process with green energy certificates

Isocyanate

Lupranat® ZERO

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high-quality recycled polyols from used mattresses | process developed by BASF | further processed into foam by our partner NEVEON | 80% recycled content | avoids creation of more landfill or incineration of precious resources

Depolymerization

Chemical mattress recycling

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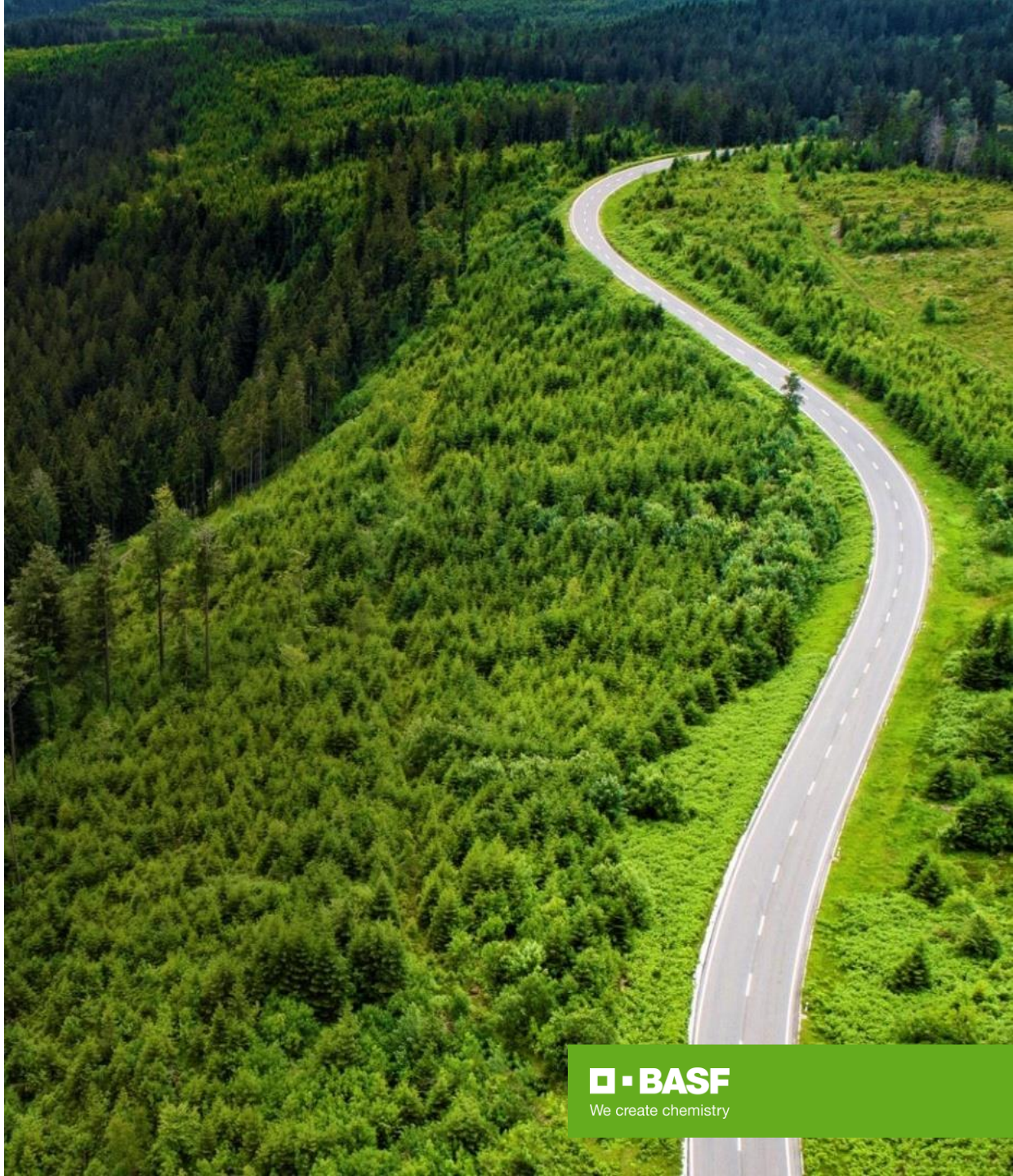
Summary

- As an energy-intensive company, we take **responsibility** for the **efficient use of energy** and **global climate protection**
- Products and **innovations based on chemistry** are the **key** to a **climate-neutral future**
- Our **optimized production set up** with **multiple Verbund sites** and already **implemented Energy Efficiency measures** have already led to a **significant reduction of our CO_2-Emissions** in the past
- Furthermore, our **products and solutions** contribute already today to the **reduction of greenhouse gases** in many areas
- Anyhow, we are working to **significantly reduce our CO_2 emissions** even further
- Which will mirror in in **even lower Product Carbon Footprints** of our products (e.g. **TDI, MDI** and **Polyols**)



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