



Chemical Industry's Contribution Towards Sustainable Future

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Environmental



Climate change is the most threatening problem of mankind, mainly driven by excessive CO₂ emissions



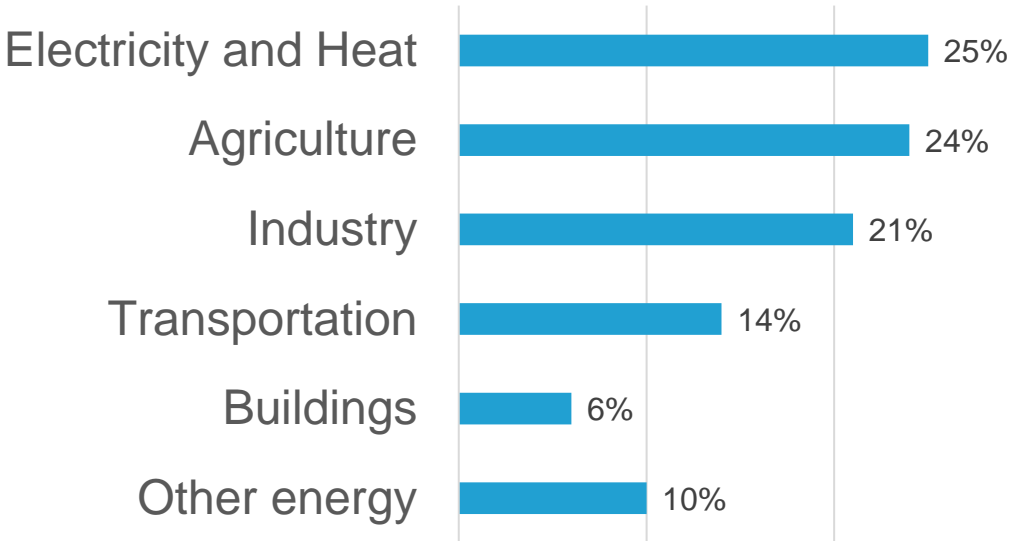
Social



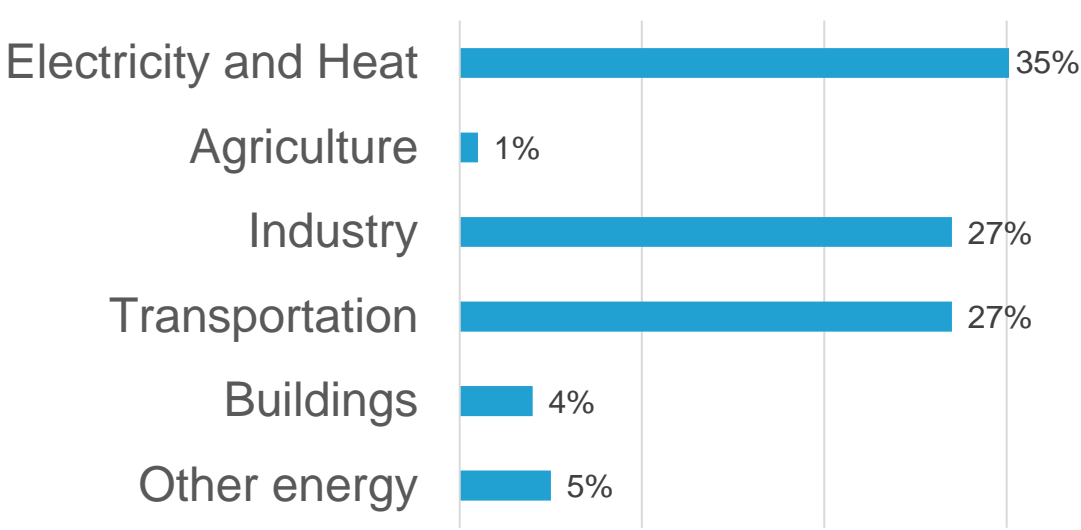
Economic

Economic sector overview of emission drivers shows several sectors emitting CO₂ at high level

Global CO₂ Emissions 2019 by economic sector¹



Indonesia CO₂ Emissions 2020 by economic sector²



Source:
 1. IPCC
 2. Indonesia Country Profile 2021

→ Importance of emitting economic sector varies from country to country



The Chemical industry with BASF as thought leader and action contributor is part of the solution to transform our way of thinking and acting



Chemicals – We are in almost everything you see and touch



Energy & Resources



Consumer Goods



Transportation



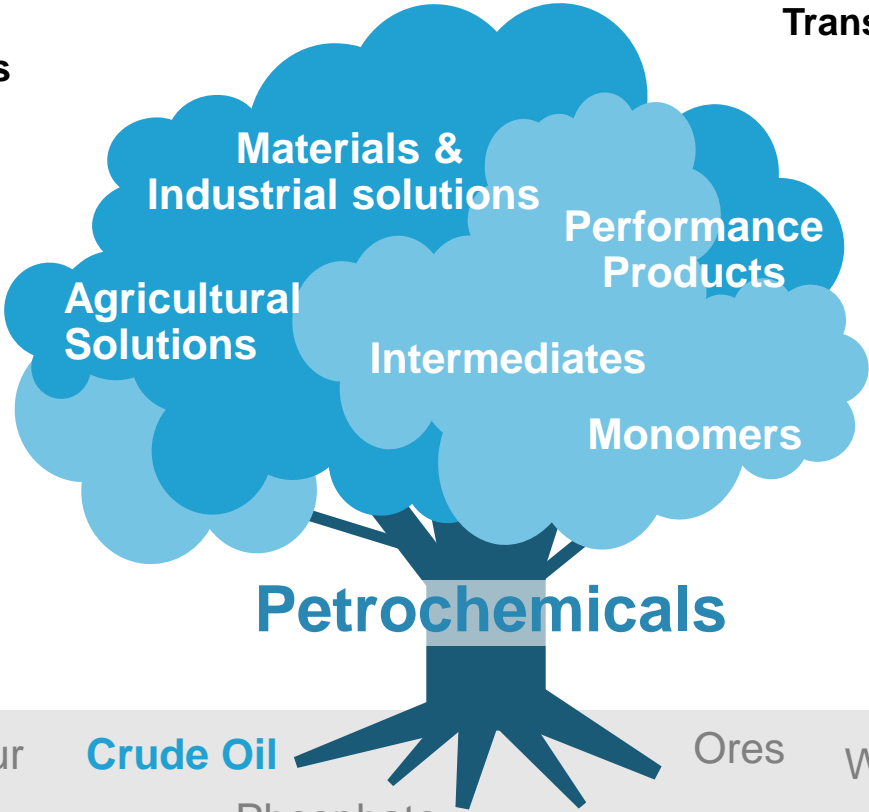
Health & Nutrition



Electronics & Electrics



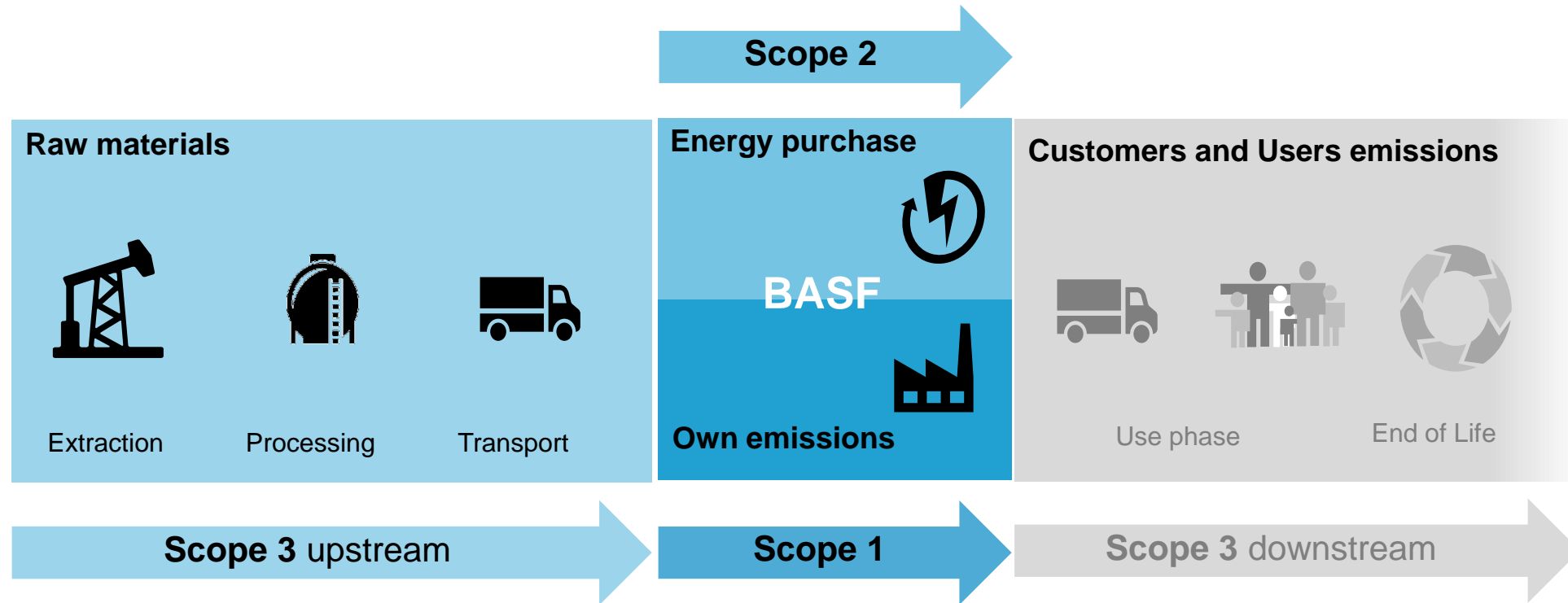
Agriculture



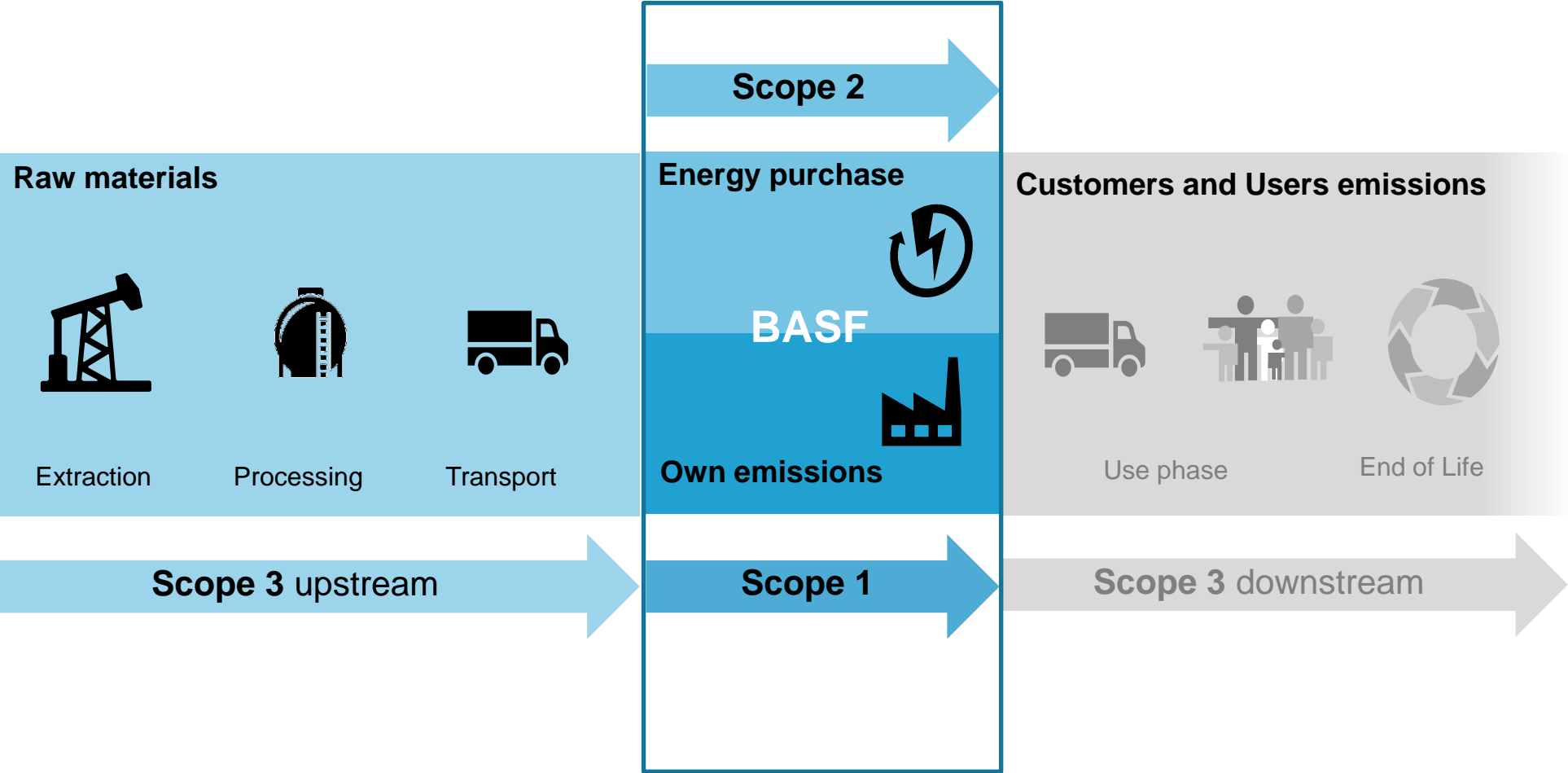
Construction & Housing



We are looking at reducing our environmental impact by looking at emissions along our entire value chain: Scope 1, 2 and 3



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We have ambitious CO₂ reduction targets...

From 1990 to 2018, BASF has already **reduced GHG emissions by 45%** despite growing the business!

2030

25%

CO₂ emissions
reduction
(compared with 2018)¹

2050

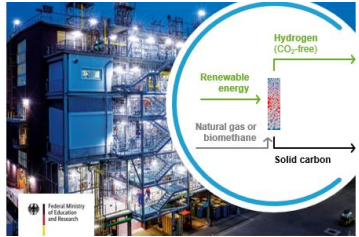
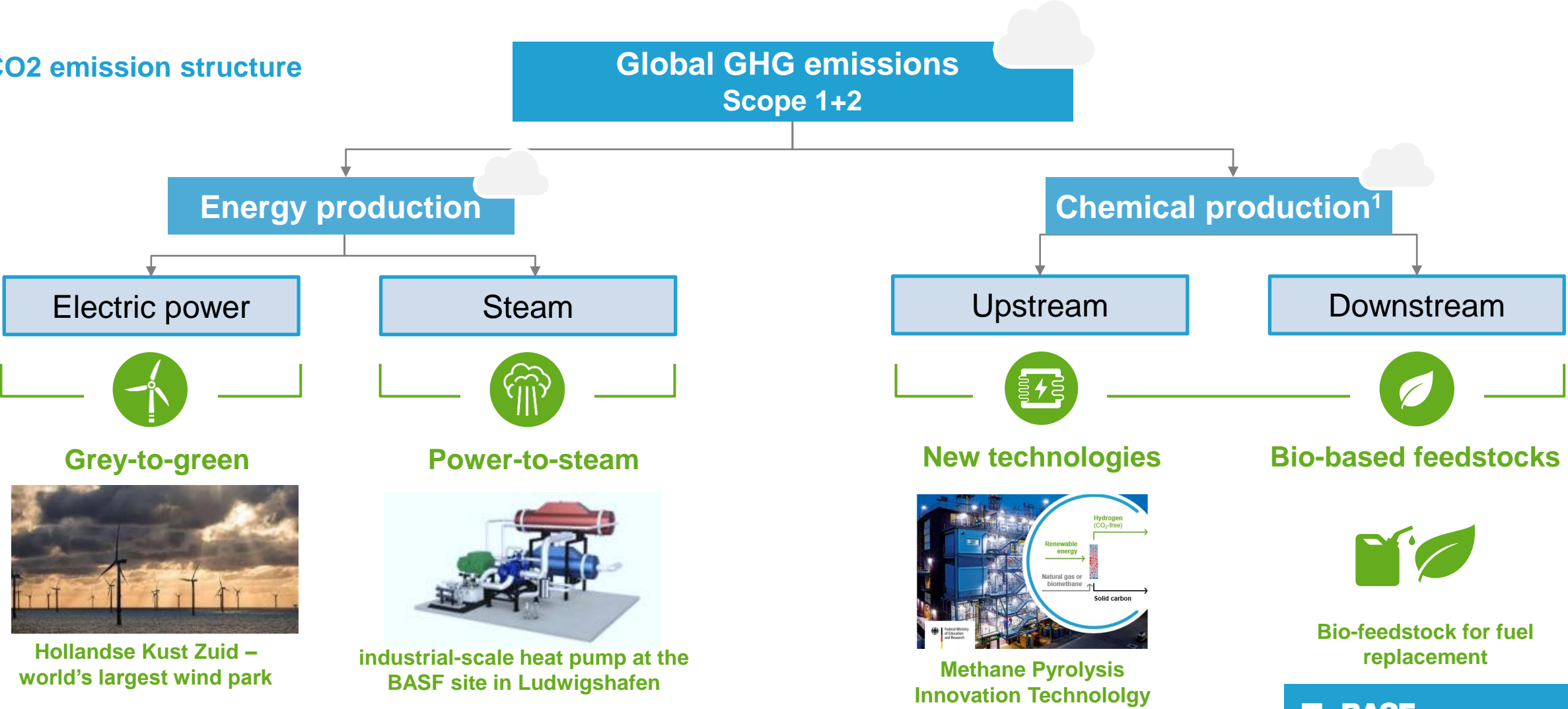
net zero
CO₂ emissions¹

...for Scope 1 and 2

¹ Scope 1 and Scope 2; 2030 target compared with 1990: 60% CO₂ reduction

No downstream decarbonization without upstream decarbonization

CO2 emission structure



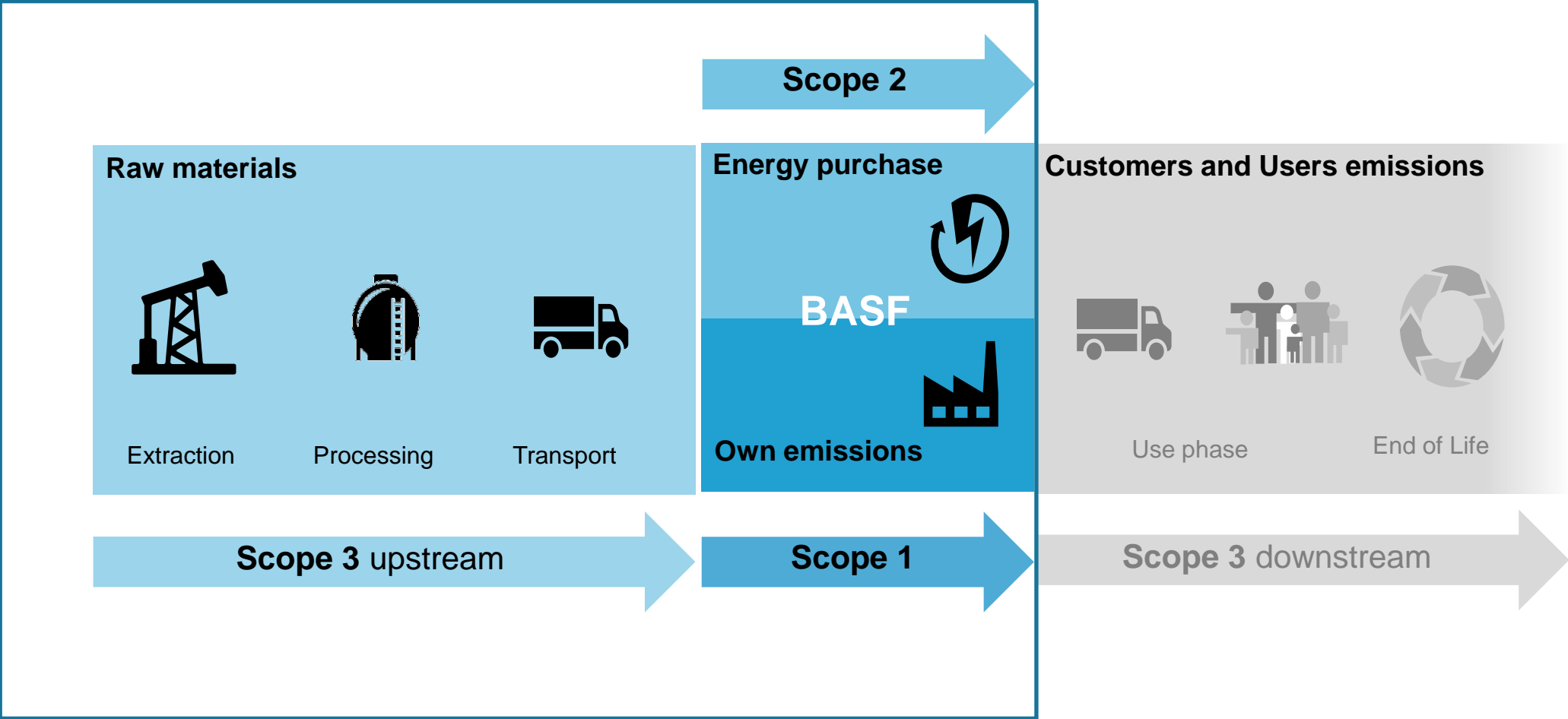
Methane Pyrolysis Innovation Technology



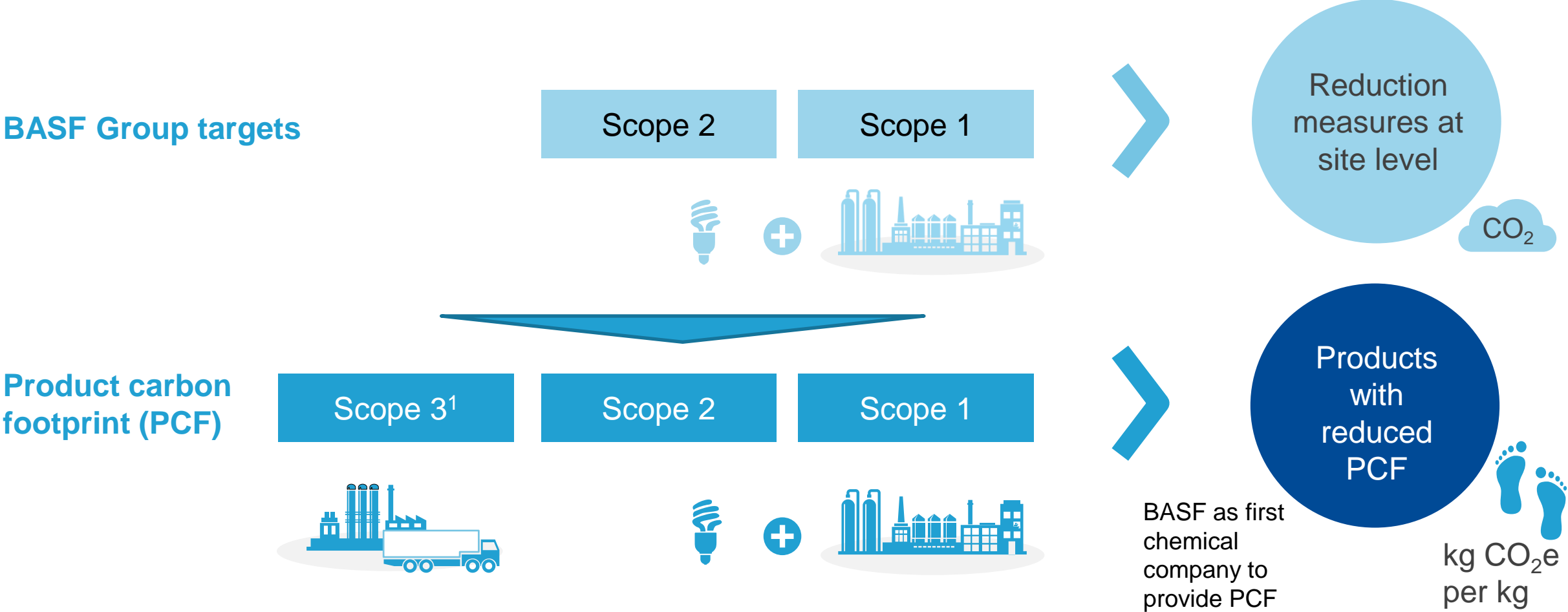
Bio-feedstock for fuel replacement

¹ Includes emissions from process energy ² Operational excellence measures

In addition to CO₂ emission reduction in our own operations, we look into our suppliers' value chain (scope 3 upstream)...



...which enable us to provide Product Carbon Footprint PCF calculation and reduction to our customers



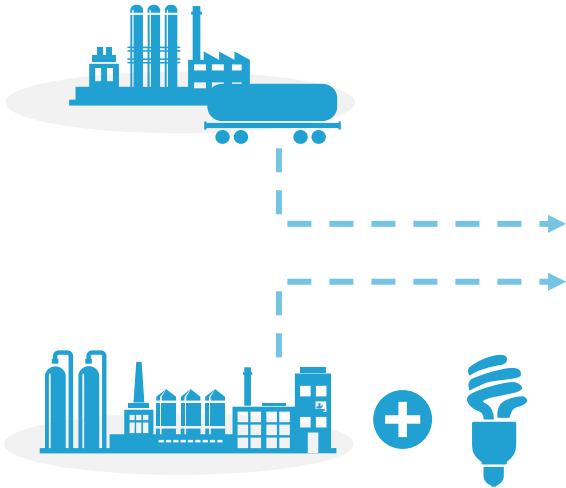
¹ Scope 3 emissions from raw materials production by suppliers AND emissions by our customers & consumers

Together for Sustainability (TfS) agreed on global guideline for PCF calculation

TfS initiative is a global, procurement-driven initiative by chemical companies to improve sustainability practices in line with e.g. UN Global Compact.

Scope 3

Emissions caused by suppliers and generation of raw materials



Scope 1 + 2

Emissions caused by own operations¹

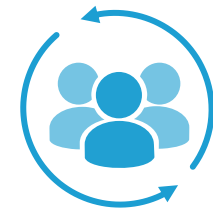


- TÜV-certified²
- Meets ISO standards³
- Calculates product carbon footprints cradle-to-gate

CO₂



Product carbon footprints of sales products



Customer benefits

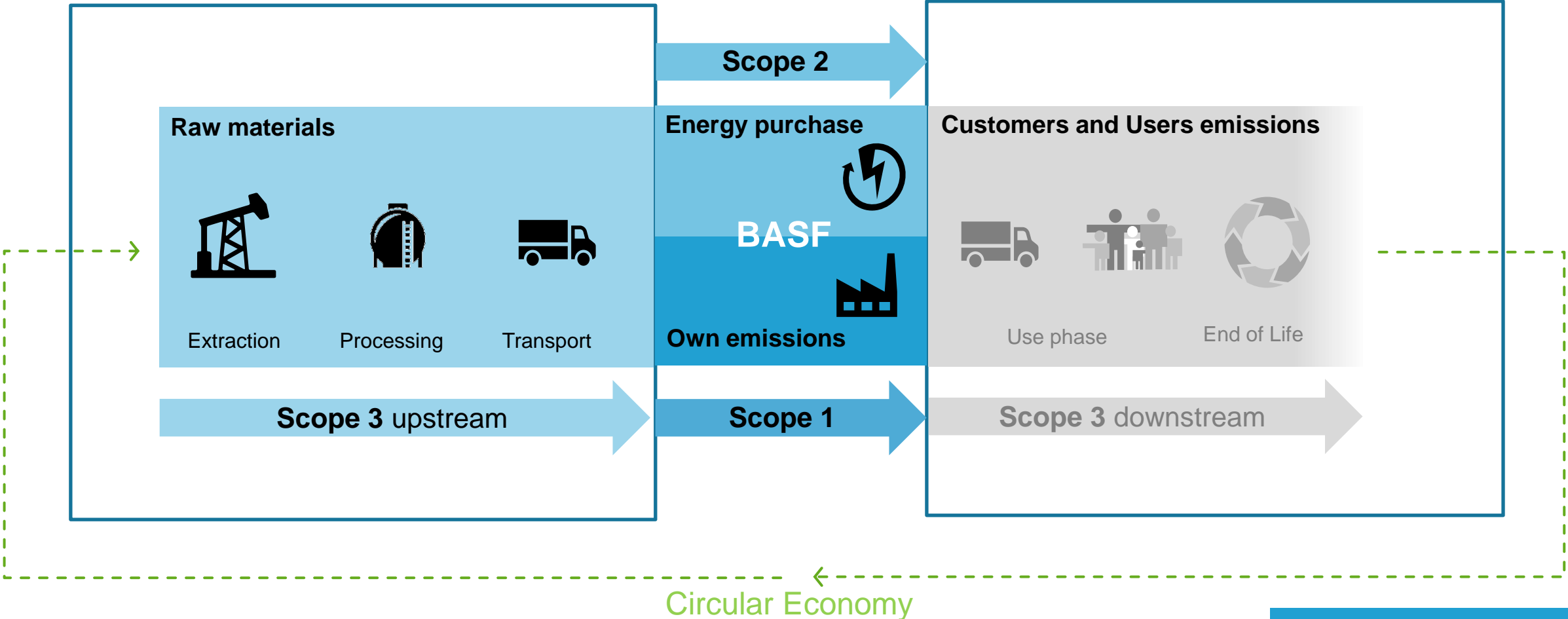
- Transparency on CO₂ emissions
- Identification of main reduction levers
- Certified software
- Transparent documentation

¹ Energy generation and chemical processes

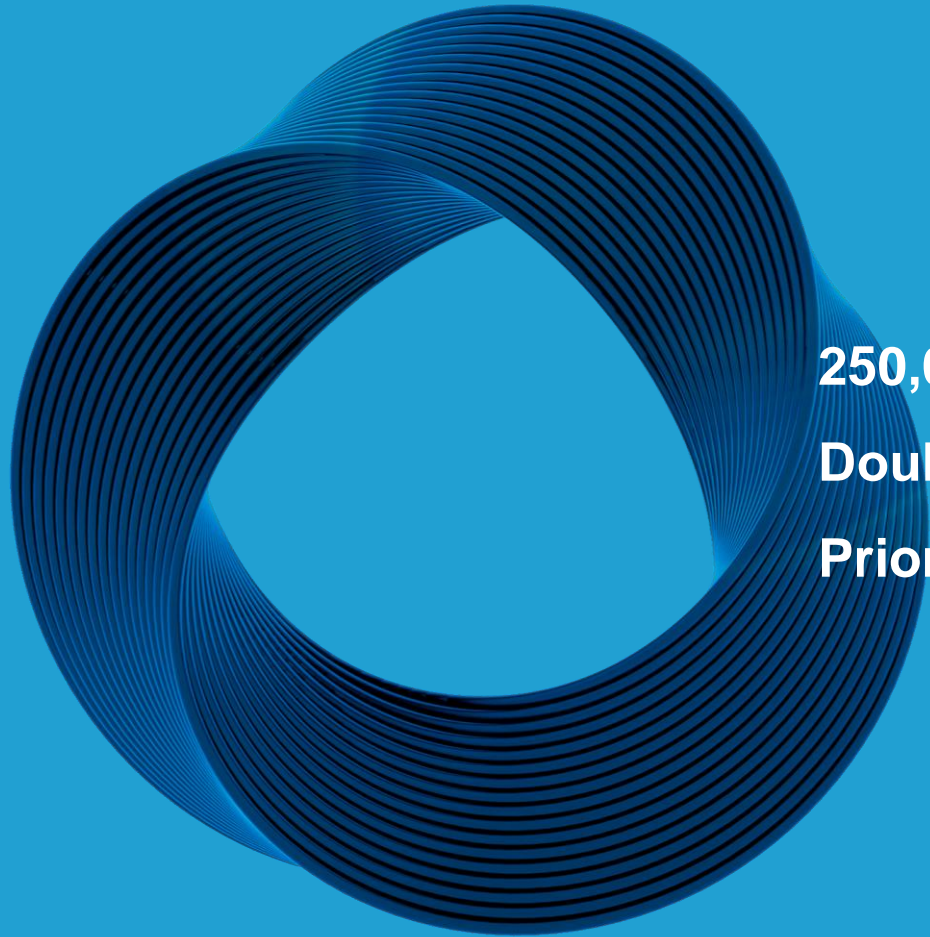
² ISO 14067:2018

³ ISO 14040:2006, 14044:2006, 14067:2018, GHG Protocol Product Standard

To further reduce scope 3 emissions downstream as well as upstream, Circular Economy models are key



Our commitments towards Circular Economy



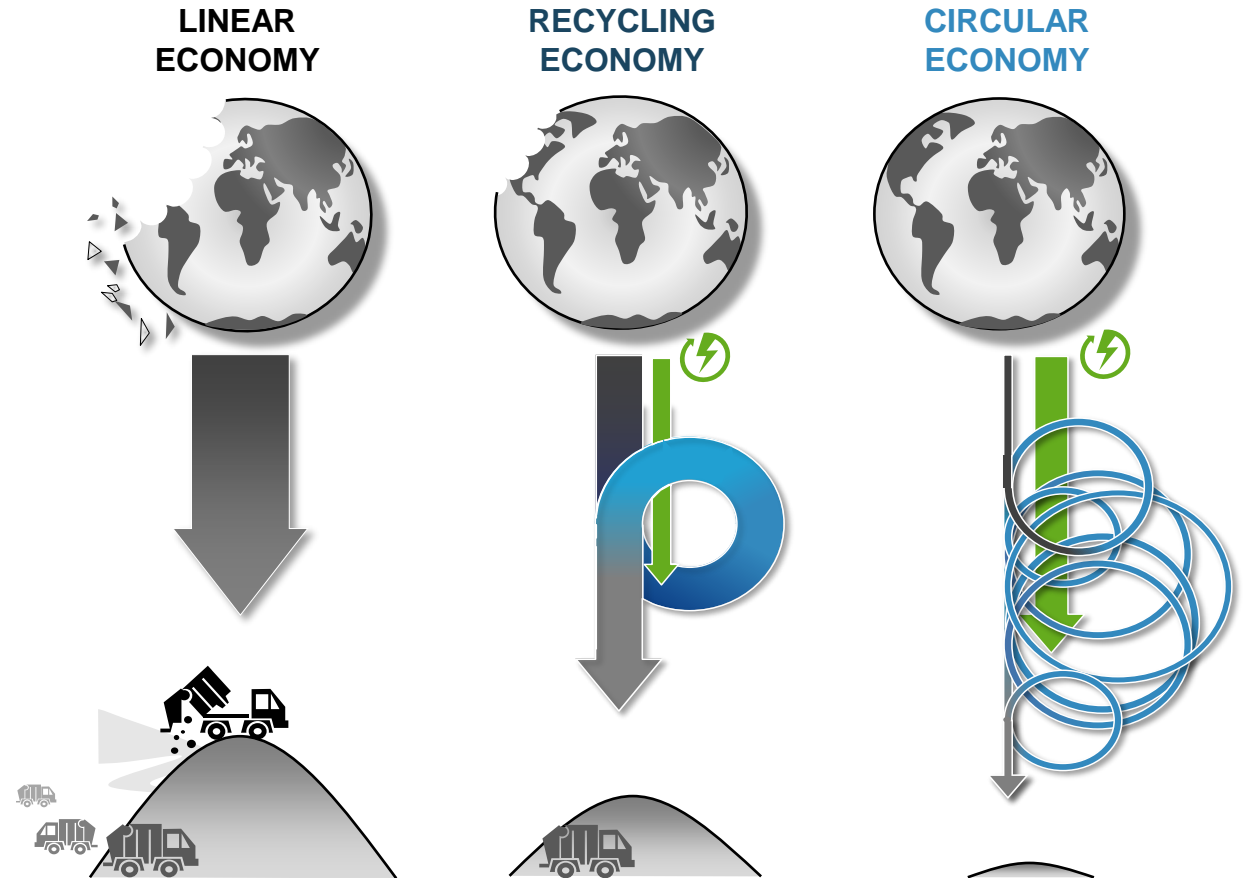
250,000 metric tons of circular feedstock by 2025

Double circular sales to €17 billion by 2030

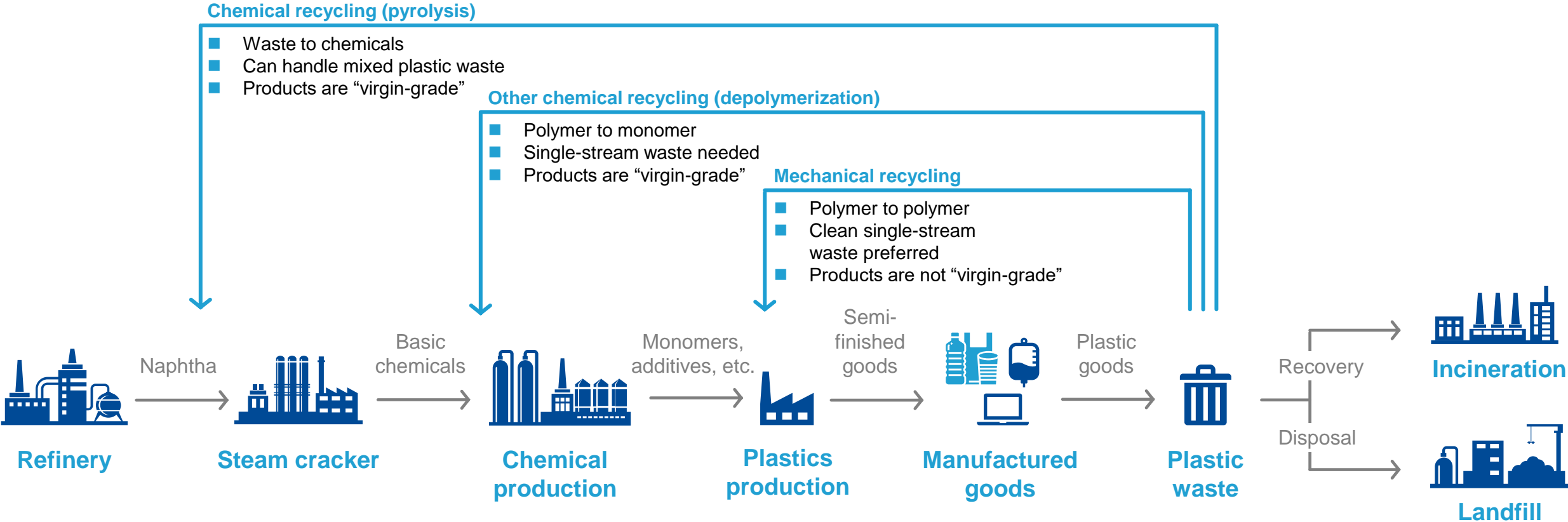
Prioritize related capex, M&A, R&D

A Circular Economy aims to decouple growth from resource consumption and is regenerative by design

- **Rethink design** and use of resources and **keep** them in **use as long as possible**
- **Recover and recycle** products and materials, regard waste as **raw material**
- **Avoid waste** and **pollution** and **protect** natural systems



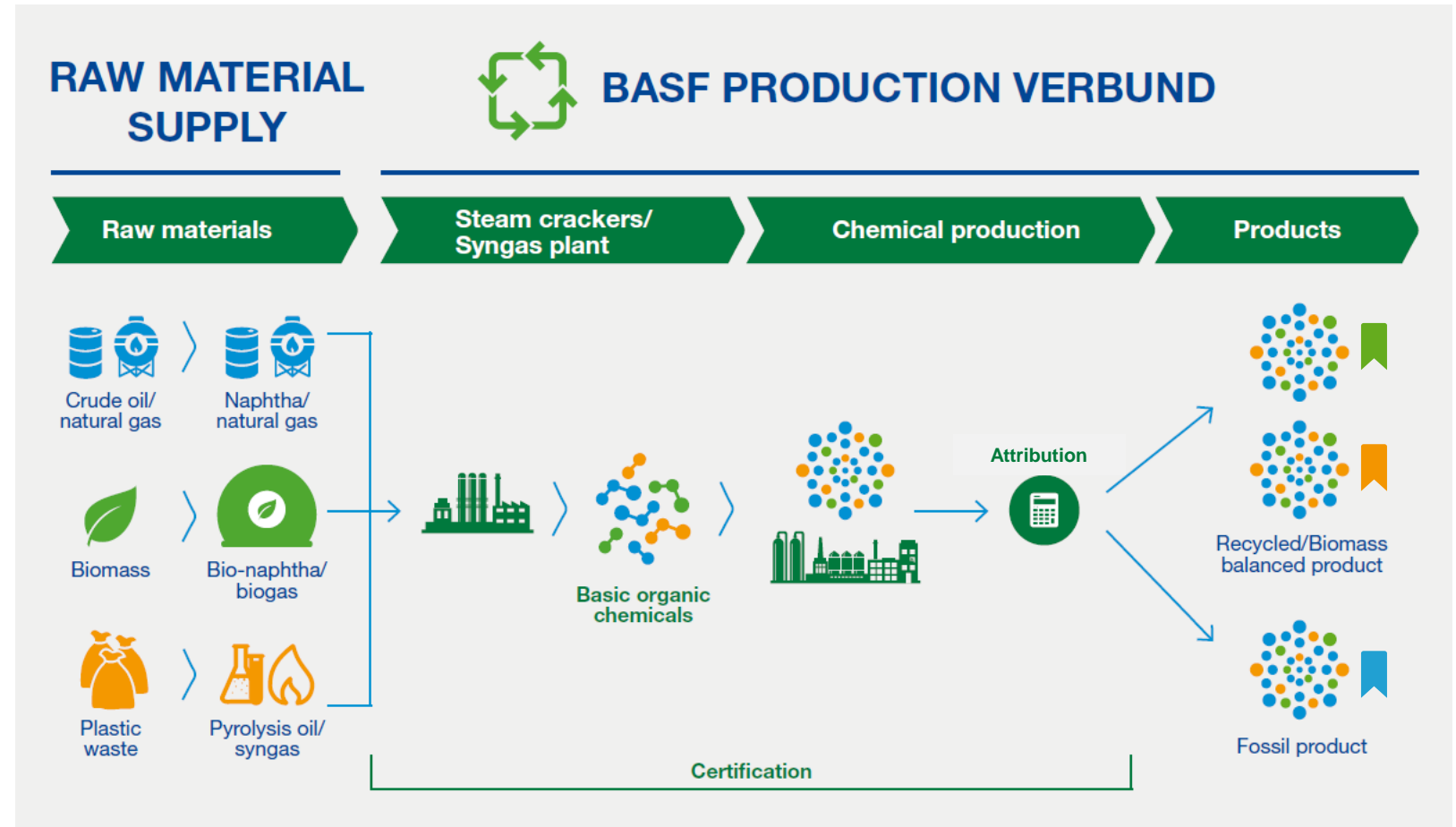
Circular Economy in plastics : Different loops are necessary for a successful transition towards circularity



→ ChemCycling™ is complementary to mechanical recycling

Mass Balance approach enables the replacement of fossil feedstock, the transition to circular and low PCF/ net-zero products

An open loop Mass Balance approach is the strongest driver to replace fossil feedstock and accelerate the use of circular feedstock



→ Mass Balance approach applies to renewable and recycling based feedstock

Our innovative solutions reduce CO₂ in our customers' applications and during consumer use phase



Certified recycled material from mechanically recycled expanded polystyrene (EPS) waste



BMW Group is the first OEM to use BASF paints certified according to biomass balance approach

Let's join forces to turn challenges into opportunities and enable a transition towards a more sustainable economy and industry



Mindset shift to circular models and scientific discussions



Cross value chain collaboration for solutions and standards



Support global and national certifications and regulations



National open loop setup and acceptance of mass balance



Global EPR schemes and CO2 pricing mechanisms



Infrastructure and access to ren. electricity + suitable waste streams

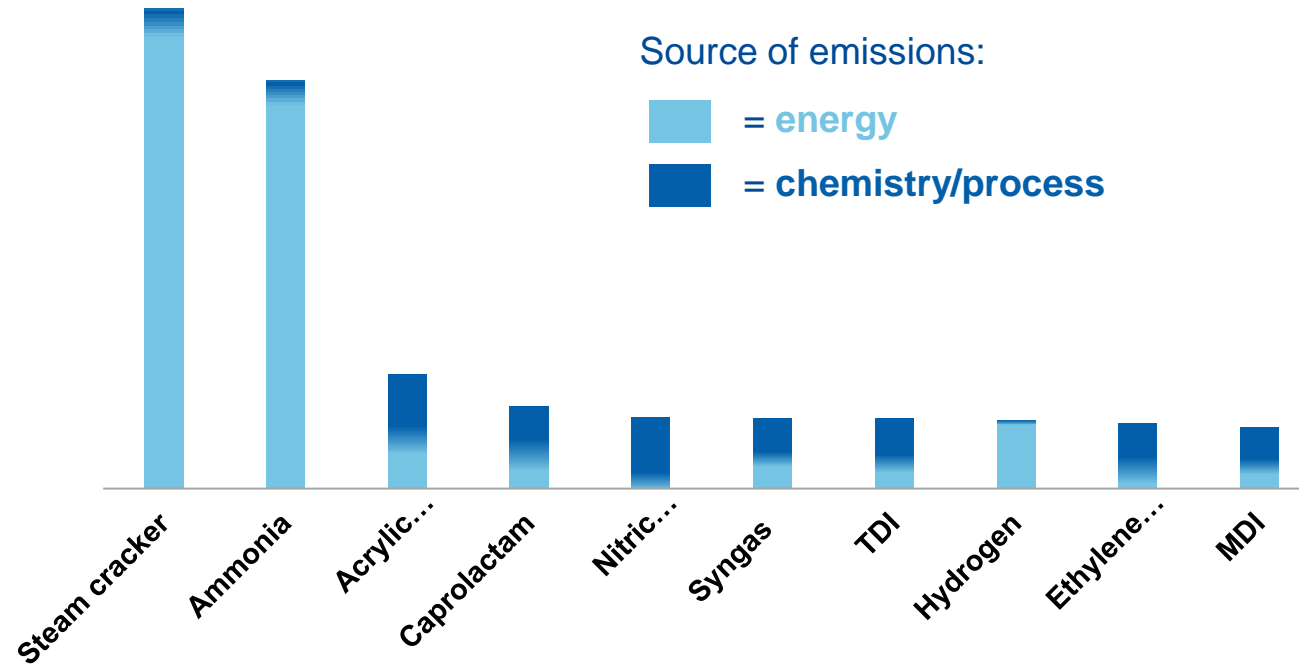


We create chemistry

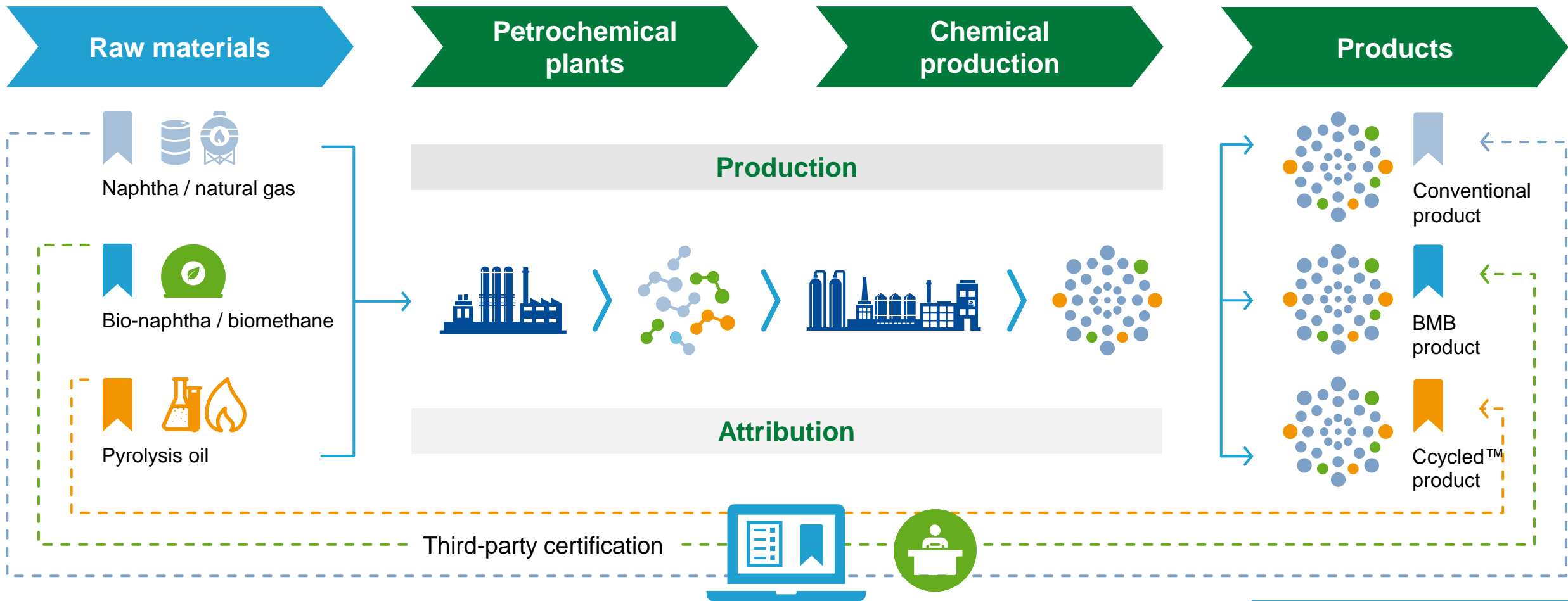
A typical view on Scope 1 and 2 emissions in the chemical industry

Exemplary CO₂ emission profile of selected technologies

Energy and chemistry emissions, million metric tons/a¹



The alternative feedstock is attributed through the mass balance approach (credit method, according to ISO 22095)



Adoption of 9R Framework¹ @BASF Indonesia

R2

Reduce

Valeras™: plastic additive with added sustainability value (improving durability, saving energy, reducing emissions, and promoting biodiversity)



R3

Reuse

2,449 intermediate bulk containers (IBCs)



R8

Recycling

IrgaCycle™ : additive that addresses specific quality issues associated with recycled resins



R9

Recover

Gardoclean™: Recycle plastics to process PET with efficient cleaners and defoamers

