

Climate action roadmap

Preserving the climate

The effects of climate change – and its acceleration – are evident all over the world. We need to act now. The climate crisis threatens people, nature and economies around the world. To avoid the most significant effects of climate breakdown, companies need to halve greenhouse gas emissions before 2030, achieve net-zero emissions before 2050, to limit global temperature rise to 1.5°C per year. Corbion believes that we have a responsibility to preserve the climate, and we play an essential role in the transition to a zero-carbon economy.

Our climate action plan has 3 pillars:

1

Reduce our own footprint in line with 1.5°C and achieve net zero by 2050.

2

Transparency with respect to the carbon footprint of our products and our operations.

3

Promote climate action by enabling our customers to reduce their footprint.

Corbion's climate action roadmap: Scope I & II

Starting our journey by implementing renewable electricity and energy efficiency measures (high technical readiness)

Temporary slow down while continuing innovation and permitting

Implementation renewable fuels and heat

CO₂-eq

2016

2021

2025

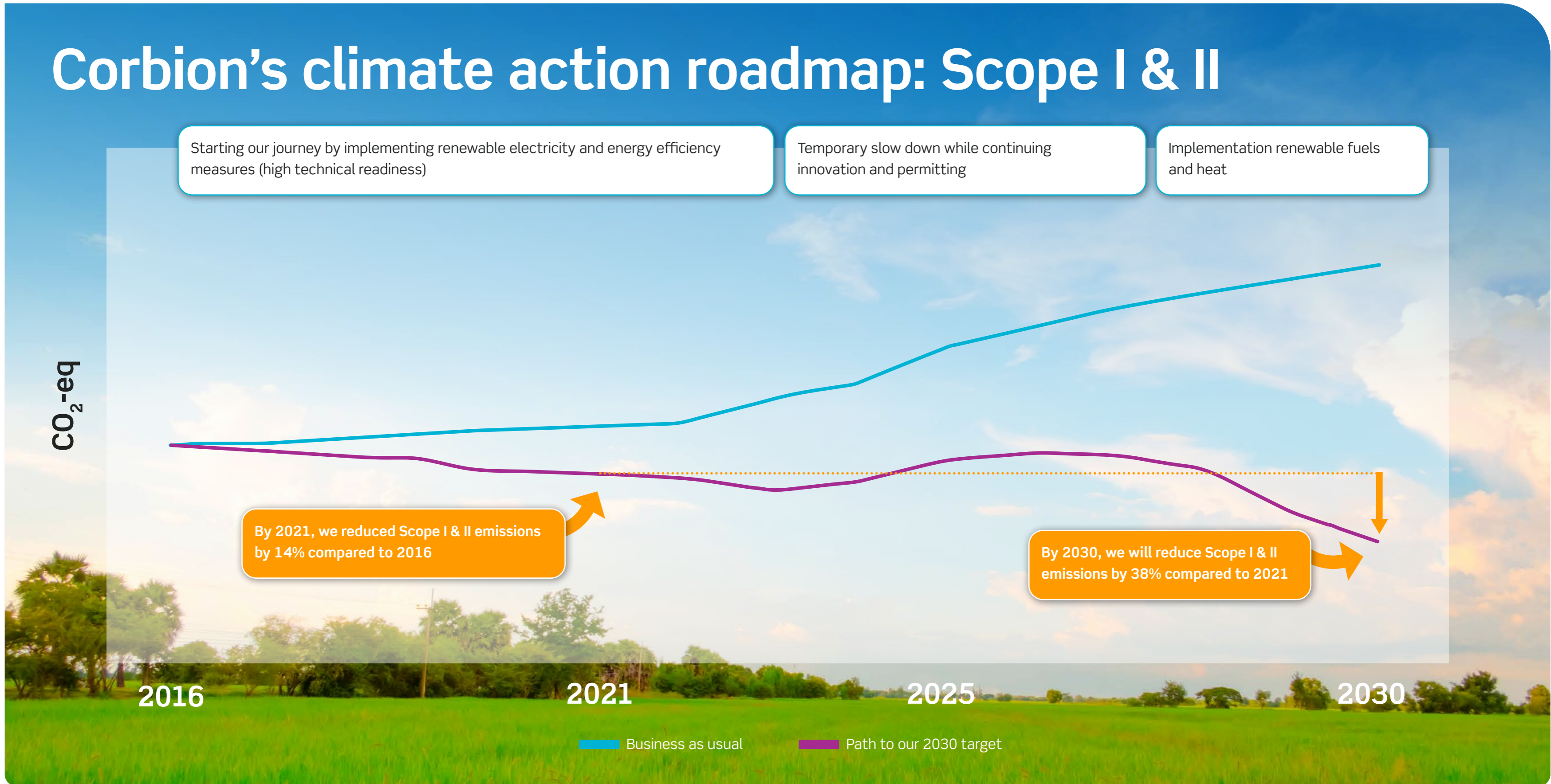
2030

By 2021, we reduced Scope I & II emissions by 14% compared to 2016

By 2030, we will reduce Scope I & II emissions by 38% compared to 2021

Business as usual

Path to our 2030 target



Corbion's climate action roadmap: Scope III

Starting our supplier engagement journey while implementing RSPO certification

Start-up circular lactic acid plant

Continued implementation of renewable energy and regenerative agriculture by suppliers

CO₂-eq

By 2021, we reduced Scope III emissions per ton of product by 21% compared to 2016

By 2030, we will reduce Scope III emissions per ton by 24% compared to 2021

2016

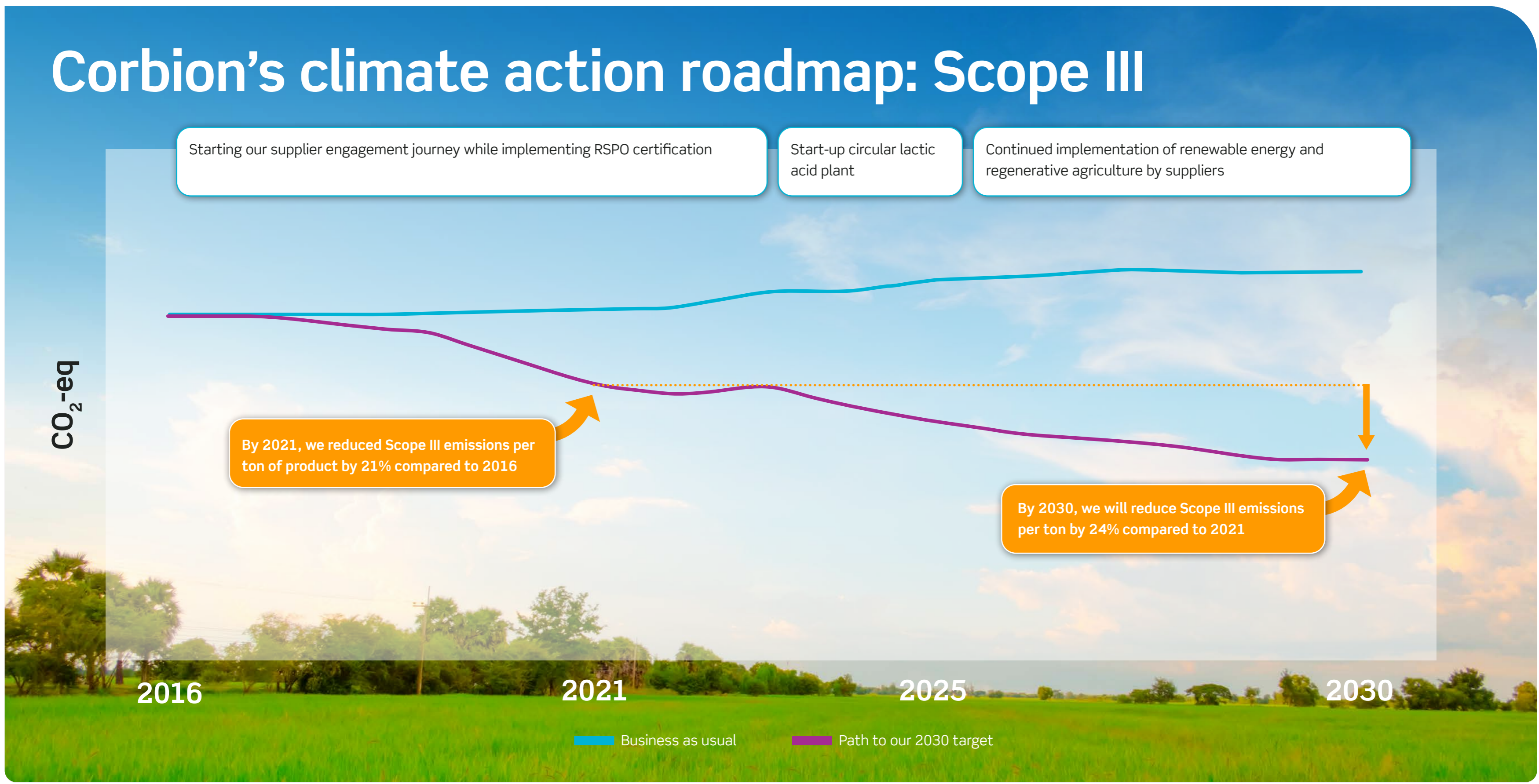
2021

2025

2030

Business as usual

Path to our 2030 target



2016-2021 achievements

In October 2019, Corbion publicly committed to climate change action, making science-based targets part of our standard business practice and tying our incentives program to those goals. We were the second Dutch chemical company with a SBTi-approved target, providing a benchmark and inspiration for our peers and partners to transition to a low-carbon economy. Our targets were approved after a thorough, independent validation process by the Science Based Targets initiative (SBTi) – a partnership between CDP (formerly the Carbon Disclosure Project), the United Nations Global Compact, World Resources Institute, and World Wide Fund for Nature. We committed to reducing our Scope I, II, and III greenhouse gas (GHG) emissions related to energy, key raw materials, and transport by 33% per metric ton of product by 2030 (with 2016 as the base year).

Since 2016, we have reduced our absolute Scope I & II emissions by 2.5% per year and, in 2021, we achieved a 27% reduction of our Scope I, II and III emissions per ton of product compared to 2016.

This reduction is primarily driven by our increased use of renewable electricity, the implementation of energy savings projects, and product mix effects. One of the key initiatives moving us towards our target is the transition to renewable electricity. Today, 9 of our 12 manufacturing sites are fully powered by renewable electricity and we have begun transitioning to renewable electricity in Thailand by sourcing some 25% of our total electricity consumption from solar farms in the country.



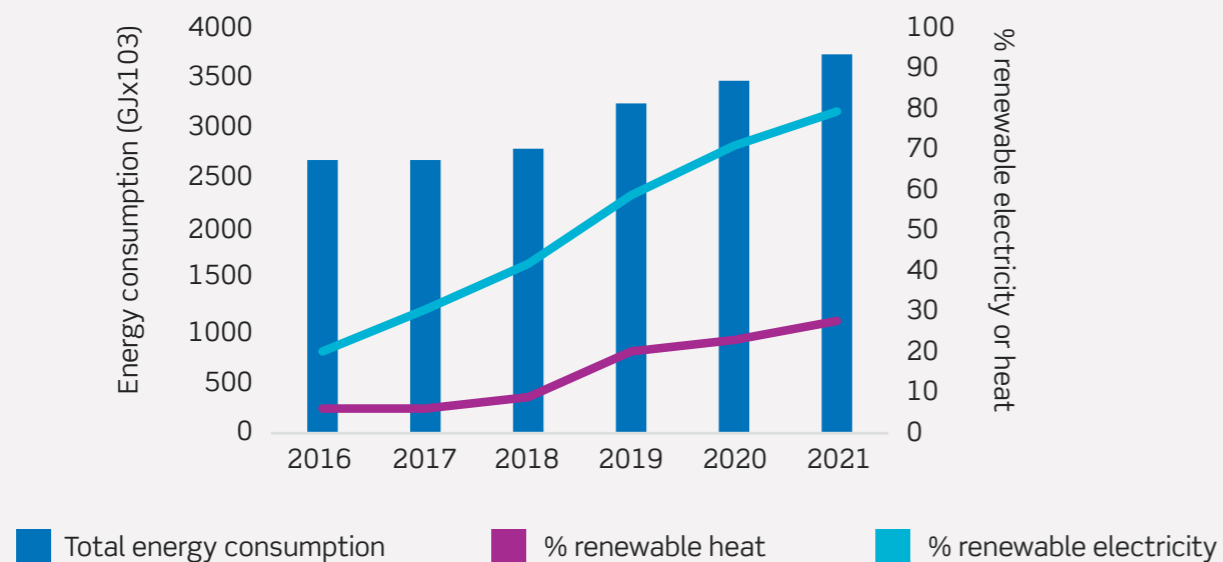
Renewable energy development

Renewable electricity

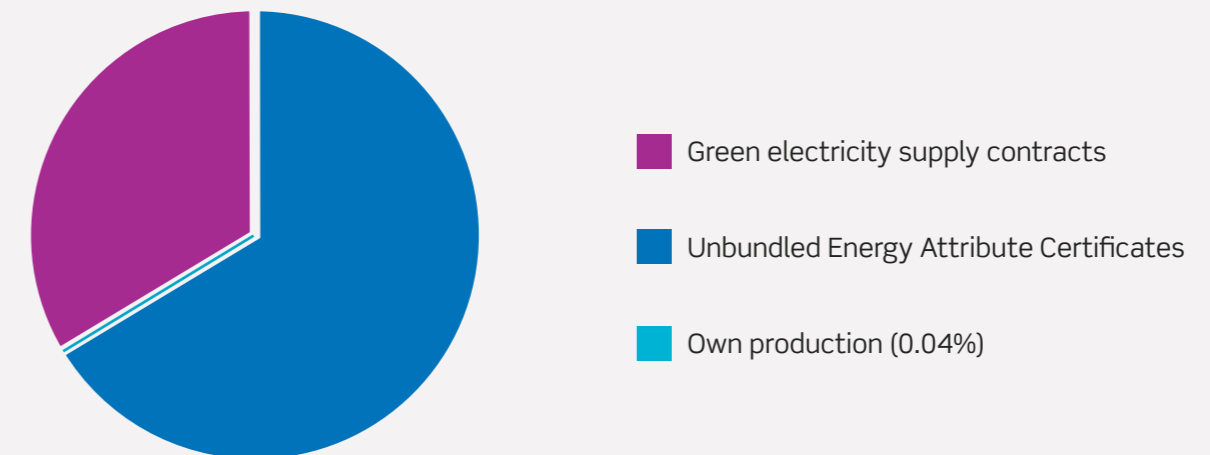
As a member of [RE100](#), a global initiative to accelerate change toward zero-carbon grids at scale, Corbion is committed to achieving 100% renewable electricity by 2025. We use a variety of sourcing tools, based on regional availability. At our manufacturing sites in Gorinchem (the Netherlands), Montmeló, (Spain), Rayong (Thailand) and Orindiúva (Brazil), we use Green electricity supply contracts. At other locations, we use unbundled Energy Attribute Certificates. We have installed solar panels at several locations, but currently these only cover a fraction of our electricity needs.

Renewable energy

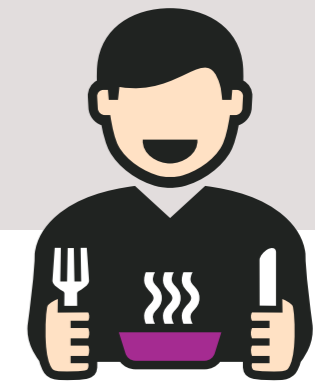
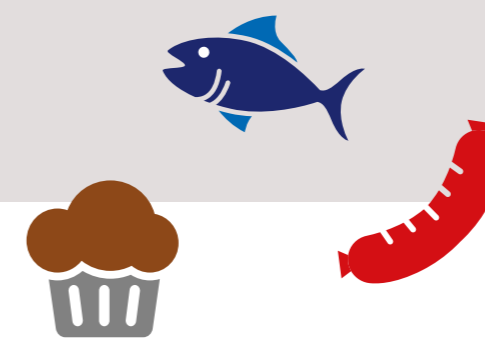
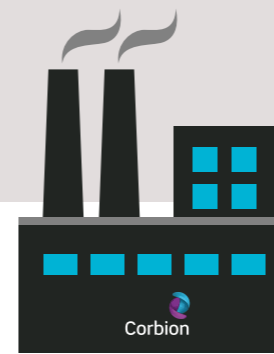
13% of Corbion's gas/steam consumption is based on renewable energy. In Gorinchem (the Netherlands), Rayong (Thailand) and Campos (Brazil) we use biogas from our own wastewater treatment installations. In Orindiúva (Brazil), our factory is integrated with a sugar mill which supplies us renewable steam produced from bagasse, a waste stream.



Renewable electricity sourcing tools



Our climate roadmap considers our entire value chain



Agriculture

Growing and harvesting of the crops used to supply Corbion's renewable raw materials. Use of fertilizer, fuels, NO₂ emissions.



Raw material suppliers

Processing of agricultural crops into raw materials, production of chemicals. Use of natural gas and electricity.



Corbion operations

Product manufacturing. Use of natural gas and electricity.



Customers

Our products are used in the following sectors:

- Bakery
- Meat
- Confectionery
- Pharmaceuticals & biomedical
- Aquaculture
- Bioplastics

Use of our products does not lead to CO₂ emissions.



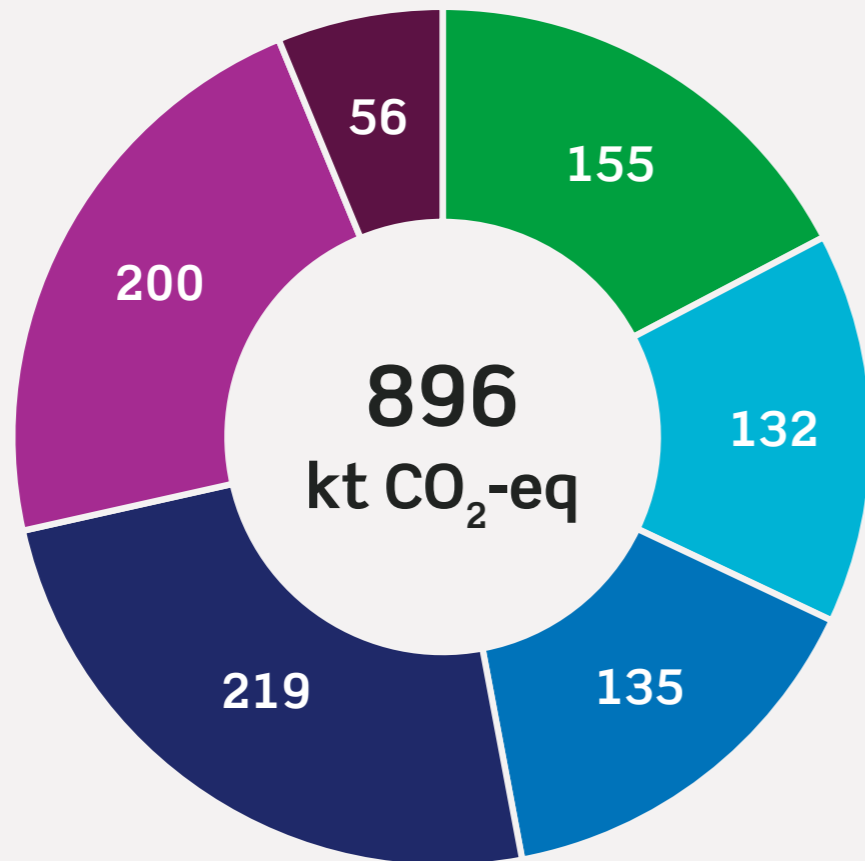
End of life

Most of our products are eaten and 98% of the carbon in our products is biobased. End of life emissions are therefore biogenic and do not contribute to climate change.



Emissions covered by our 2030 target

Our 2030 target covers the following emissions (kton CO₂-eq in 2021)



Following SBTi guidelines, we have excluded the following emissions: capital goods, fuel- and energy-related emissions, business travel, employee commuting, leased assets, processing, use and end-of-life treatment of sold products, franchises, and investments (including joint ventures).

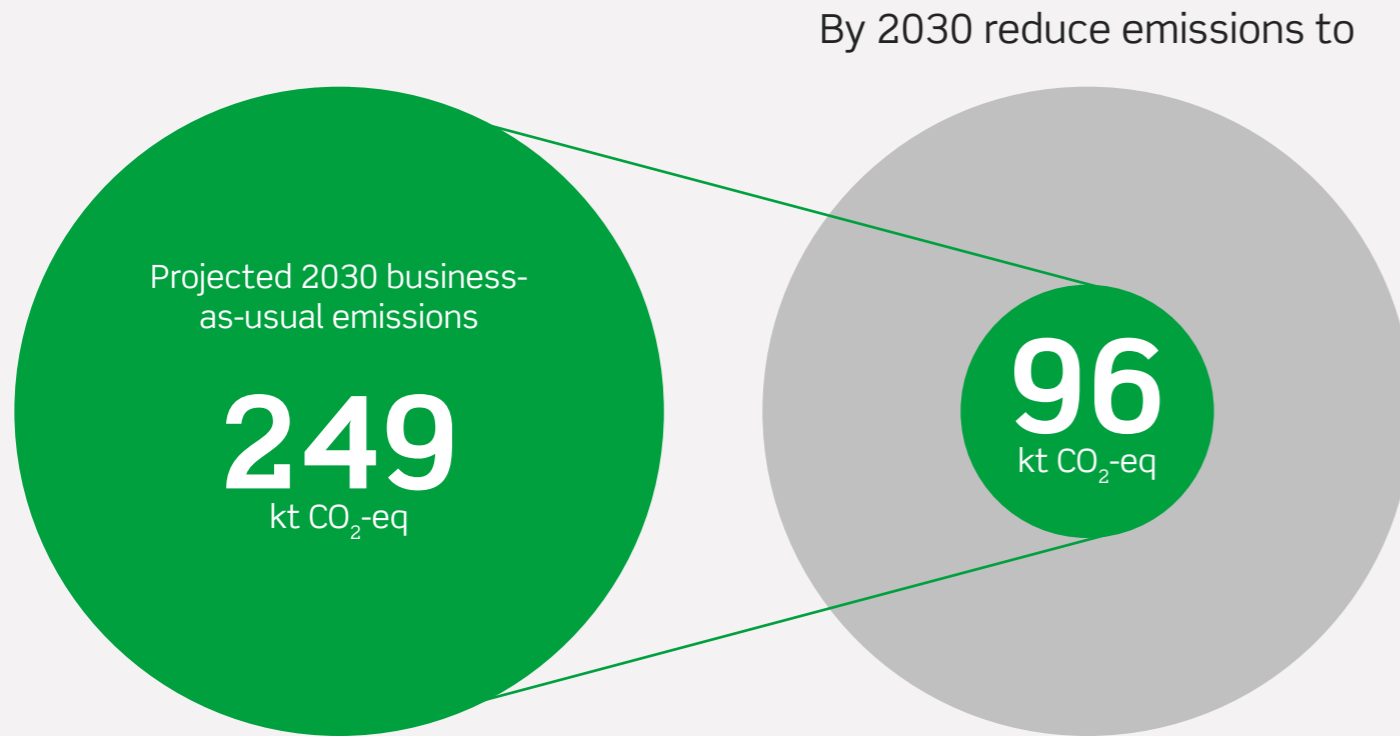
	Scope I & II	17%
	Scope III	15%
	Scope III	15%
	Scope III	25%
	Scope III	22%
	Scope III	6%

Our climate action plan

Energy



Energy-related emissions and reductions from 2021 to 2030.



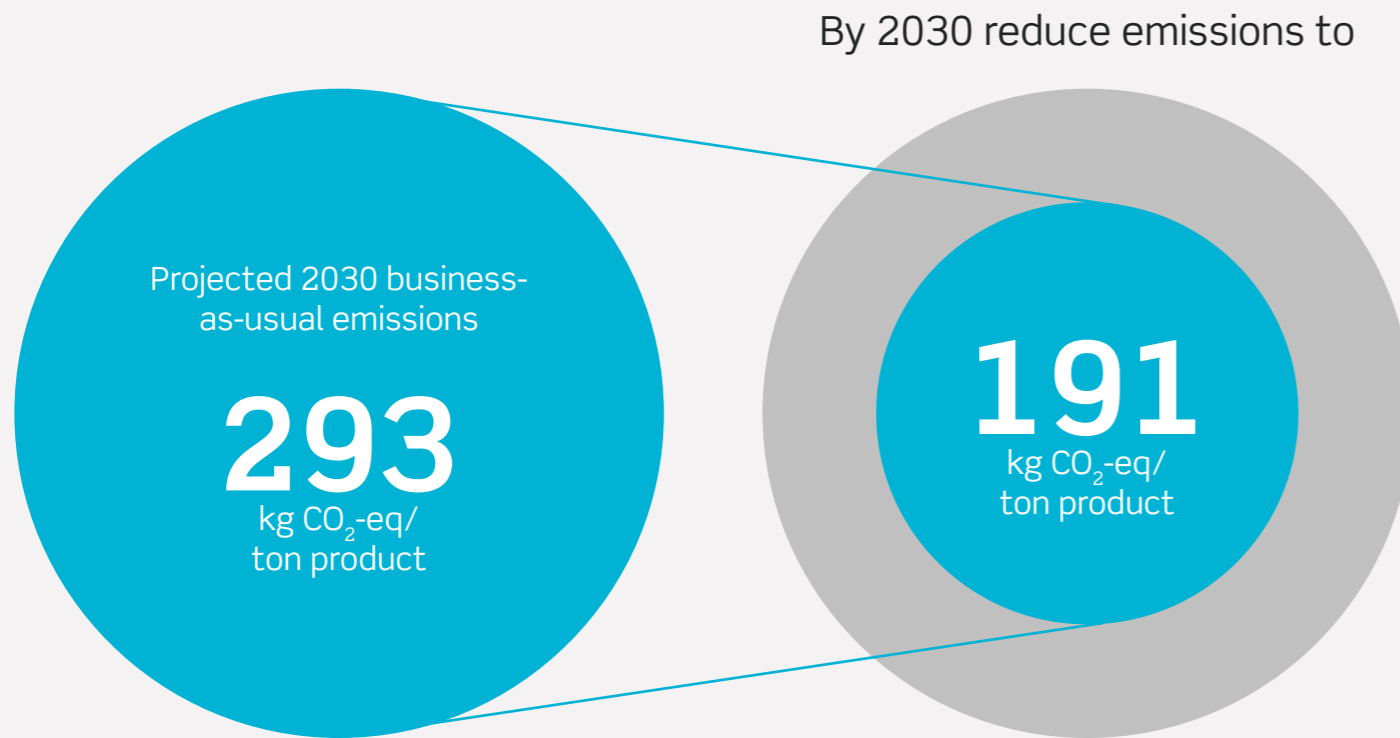
Actions to achieve our 2030 ambition:

- 6 Install the most efficient equipment available when replacement is needed
- 33 Implement renewable electricity at all remaining sites
- 55 Implement breakthrough technologies
- 59 Implement renewable heat

Carbohydrates



Carbohydrate supply chain emissions and reductions from 2021 to 2030.



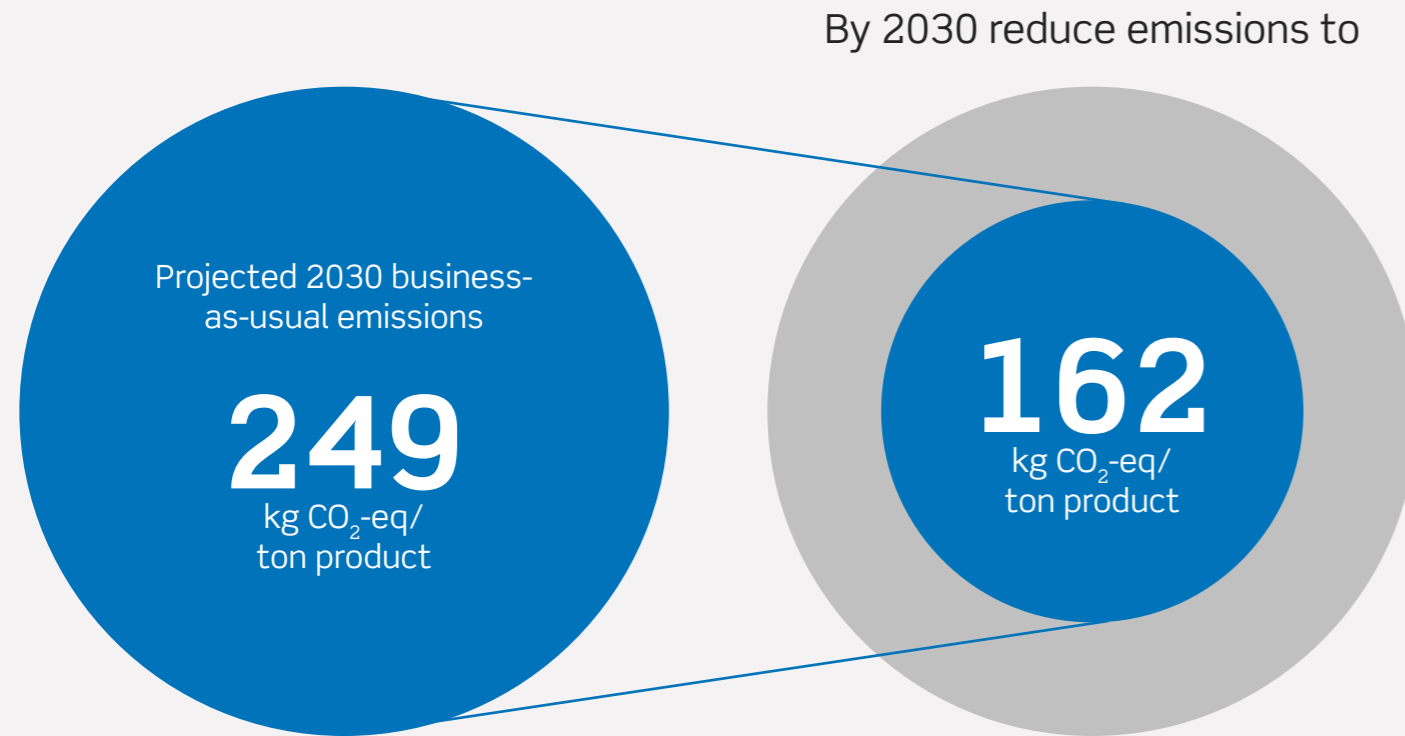
We are engaging with suppliers and supply chain partners to achieve our 2030 ambition through the following actions:

- 6.3 Fully implement renewable electricity
- 16 Improve energy efficiency and switch to renewable fuels
- 3.3 Reduce use of fertilizers
- 18 Increase generation of renewable electricity from bagasse at cane sugar mills
- 19 Implement regenerative agriculture practices such as cover crops and crop rotation
- 39 Increase crop yield through improved varieties and new technologies

Oils



Oils supply chain emissions and reductions from 2021 to 2030.



We are engaging with suppliers and supply chain partners to achieve our 2030 ambition through the following actions:

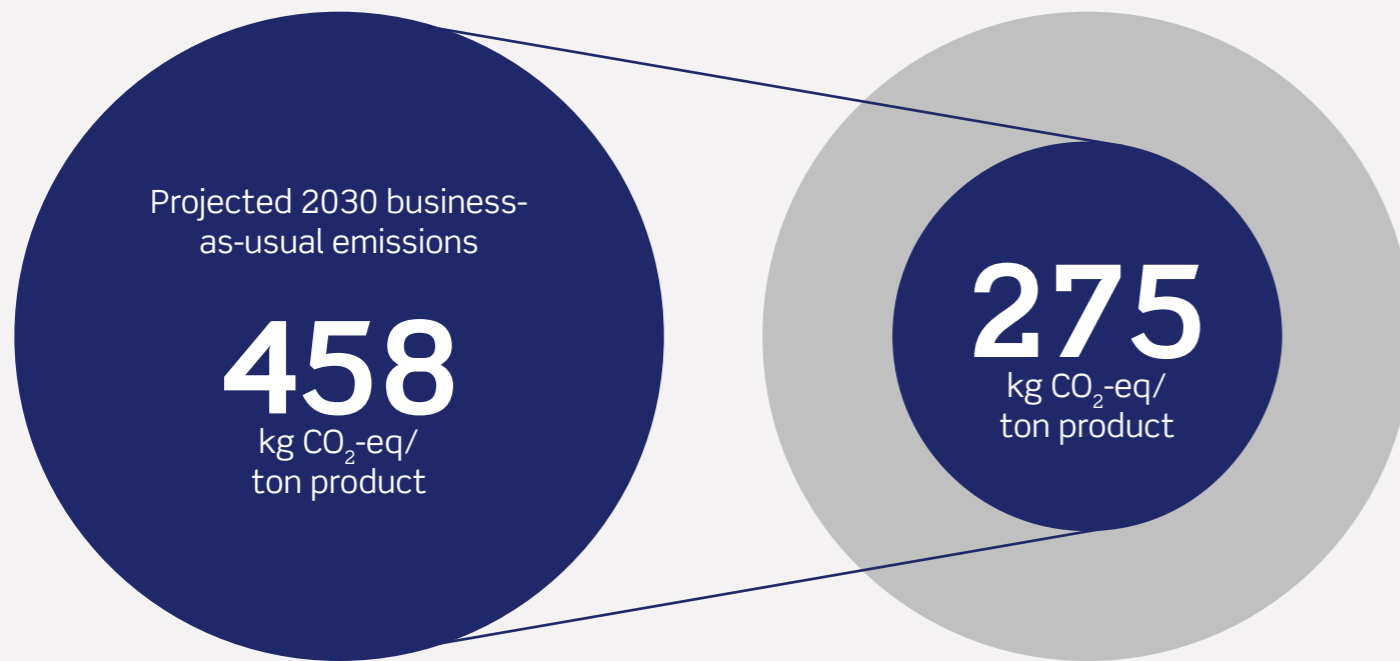
- 28 Achieve deforestation-free sourcing
- 37 Increase crop yield through improved varieties and new technologies
- 3.6 Fully implement renewable electricity
- 18 Improve waste treatment at palm oil mills and implement methane capture

Chemicals



Chemicals supply chain emissions and reductions from 2021 to 2030.

By 2030 reduce emissions to



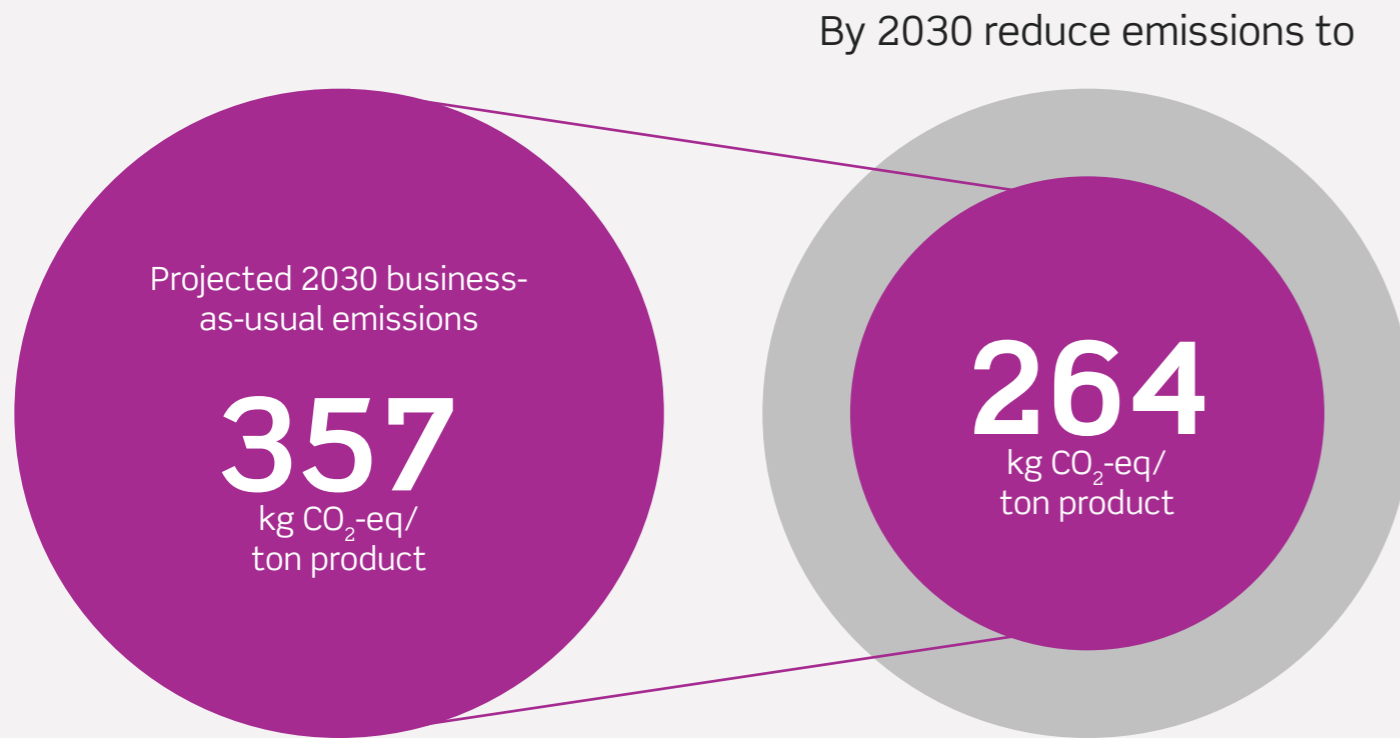
We are innovating at Corbion and engaging with our suppliers and supply chain partners to achieve our 2030 ambition through the following actions:

- 105** Implement next-generation lactic acid technology, eliminating use of lime and sulfuric acid at Corbion
- 34** Improve energy efficiency and switch to renewable fuels
- 34** Fully implement renewable electricity
- 10** Capture CO₂ during lime production

Transport



Transport supply chain emissions and reductions from 2021 to 2030.



We are engaging with supply chain partners to achieve our 2030 ambition through the following actions:

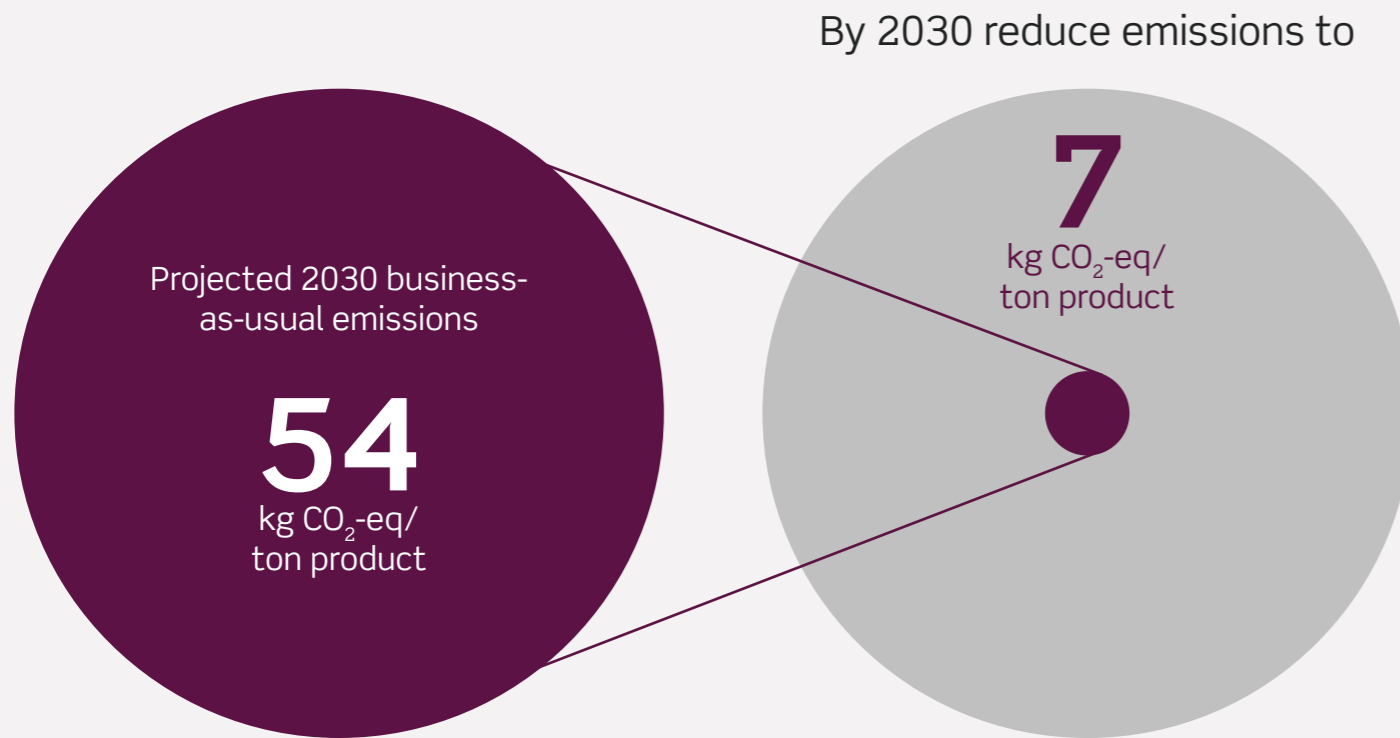
- 18 Increase use of rail and water transport
- 29 Deploy electric and hydrogen-powered vehicles
- 13 Optimize intracompany logistics
- 16 Adjust truck size to fit load and optimize use of vehicle space
- 17 Optimize diesel systems and use of alternative fuels (biofuels)

Waste



Waste-related supply chain emissions and reductions from 2021 to 2030.

Actions to achieve our 2030 ambition:



- 4 Valorize all lactic acid by-products
- 43 Eliminate landfill waste through waste reduction and improved segregation and recycling

Radical process development

In 2018, Corbion assembled a cross-functional team to identify and develop CO₂ reduction opportunities for existing and future manufacturing facilities. A core team of process development and design specialists is assessing all Corbion manufacturing sites to propose Capex projects for inclusion in the SBT Capex roadmap. For future plants, we will implement our new circular technology for lactic acid production and continue to innovate, to develop the lowest carbon footprint technology for lactic acid. The program also includes process innovation projects focussed on CO₂ reduction for strategic products in Corbion's portfolio.

The program is supported by digitalization and participation in various external research programs aimed at developing low-carbon technologies. Corbion is member of the [Institute for Sustainable Process Technology](#), the [ELECTRIFIED](#) consortium and participates in [VoltaChem](#).

Capex investments over the strategy period (2023-25) add up to 160 million euro average per annum. This includes investments to reduce our CO₂ emissions, which are integrated in the expansions of several of our existing lactic acid facilities. Also the construction of the new circular lactic acid plant in Thailand (Capex of approximately US\$ 190 million) contributes significantly to our Scope III CO₂ reduction target due to the elimination of the use of lime and sulfuric acid. Compared to conventional technology, the cradle-to-gate CO₂ emissions per metric ton of lactic acid by are reduced by 19%.

We use internal carbon pricing to manage and understand the financial impact of GHG emissions on our business. Considering the EU ETS forecast scenarios of € 90, € 125, and € 150 per metric ton by 2030, Corbion has introduced a global internal carbon price of € 100 per metric ton for Scope I and II emissions to be included in all investment decisions.

Existing plants

Energy efficiency

Electrification

Renewable heat

Future plants

Circular lactic acid

Circular raw materials

Process innovation

Powders & ferments

Algae solutions

Solvents

Digitalization

External research programs

Supplier engagement & raw material certification

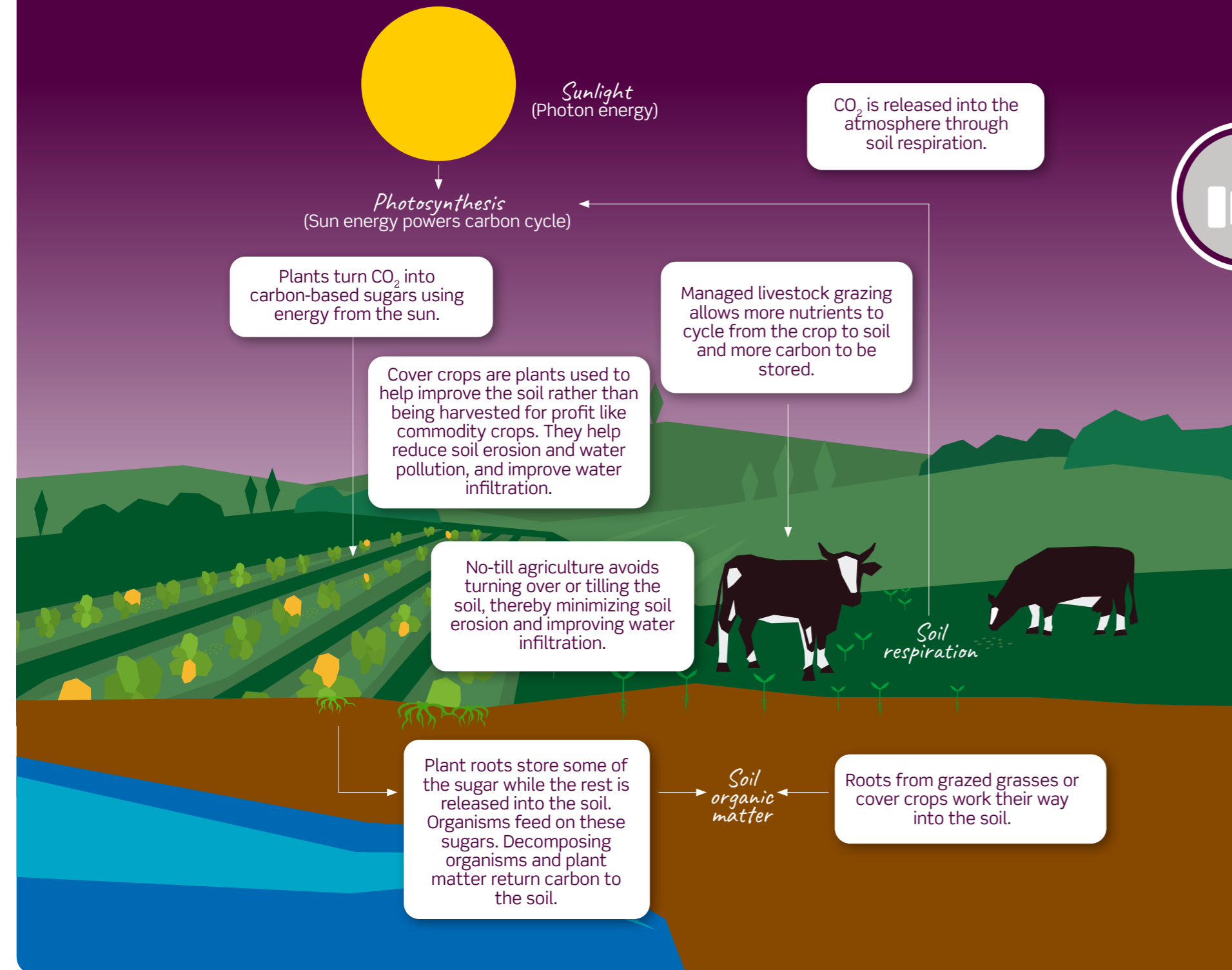
Partnerships with our key raw material suppliers are essential to achieving targeted Scope III reductions. In 2018, we began reaching out to key suppliers to raise climate change awareness, to share our CO₂ reduction ambitions and to start collecting data. We tailor our approach based on the maturity level of our suppliers and the regional context. Our goal is to assess the footprints of these raw materials and identify GHG reduction opportunities. Opportunities identified so far include: implementation of energy efficiency measures, renewable electricity and renewable fuels.

In addition to engaging our suppliers, we have also implemented third-party sourcing certifications, through organizations such as the Roundtable for Sustainable Palm Oil (RSPO) and Bonsucro, which promote GHG emissions reductions through compliance with stringent environmental standards.

Specifically in Brazil, cane sugar suppliers also produce biofuels and voluntarily have their production process audited under the RenovaBio program (National Biofuels Policy). This program provides a framework for certifying a mill's efficiency in reducing GHG emissions, which is of strategic importance to the achievement of national decarbonization targets.



Regenerative agriculture



The benefits of regenerative agriculture go beyond mitigating climate change. Farms see improved profitability because better soil health creates better yields, and less is spent on chemicals and fuel. Improved land utilization frees up less-profitable acres for conservation. Improved nutrient utilization helps preserve and protect water quality. Reduced chemical use lowers health risks for farmers and consumers. Soils rich in organic matter are better able to manage moisture when faced with extreme events like floods and drought.

This improves food security and makes farms more resilient.

Preserving food & food production

- ✓ Boosts food chain resiliency
- ✓ Improves biodiversity
- ✓ Enhances farmer resiliency



Preserving health

- ✓ Enables production of healthy foods within the boundaries of the planet
- ✓ Reduces exposure to chemicals
- ✓ Reduces use of synthetic crop inputs



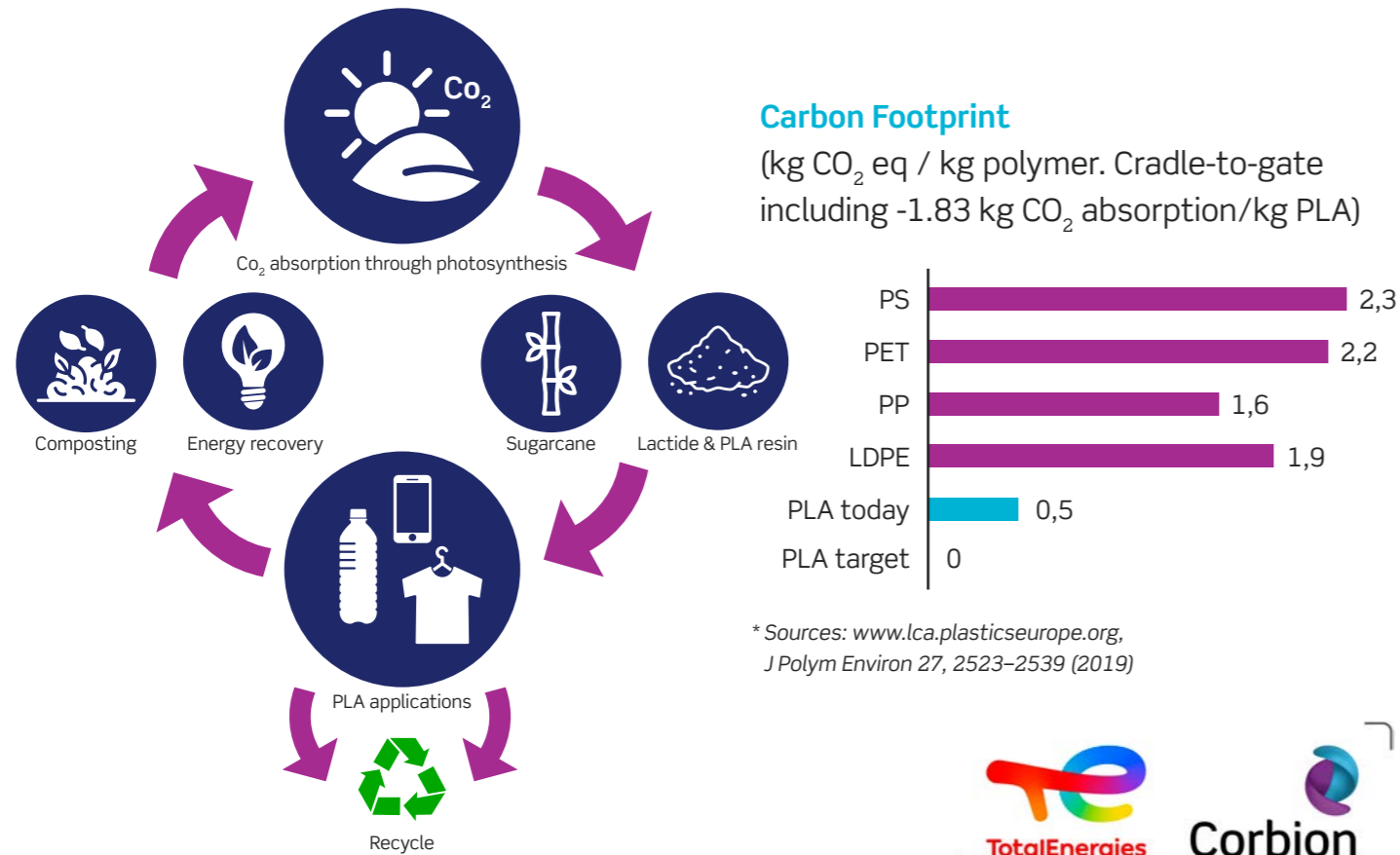
Preserving the planet

- ✓ Enhances carbon sequestration
- ✓ Reduces GHG emissions
- ✓ Reverses soil degradation
- ✓ Preserves water quality

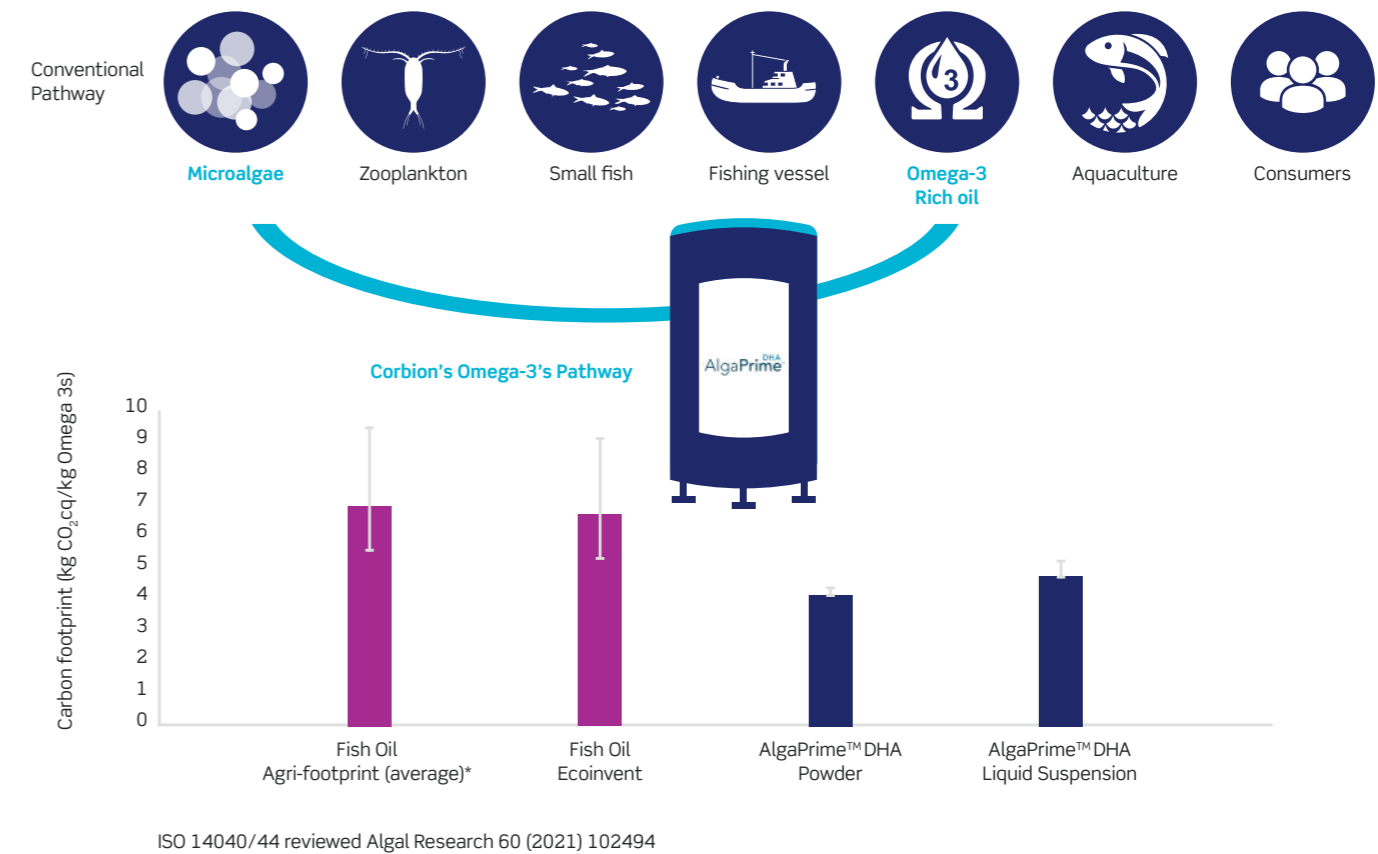


Promoting climate action by enabling our customers to reduce their footprint

PLA bioplastics are 100% biobased and have a low carbon footprint



Omega-3 from AlgaPrime™ DHA has a lower carbon footprint than average fish oil



Transparency: The carbon footprint of our products and operations

You can't manage what you don't measure, and high-quality information is the fundamental basis for action.

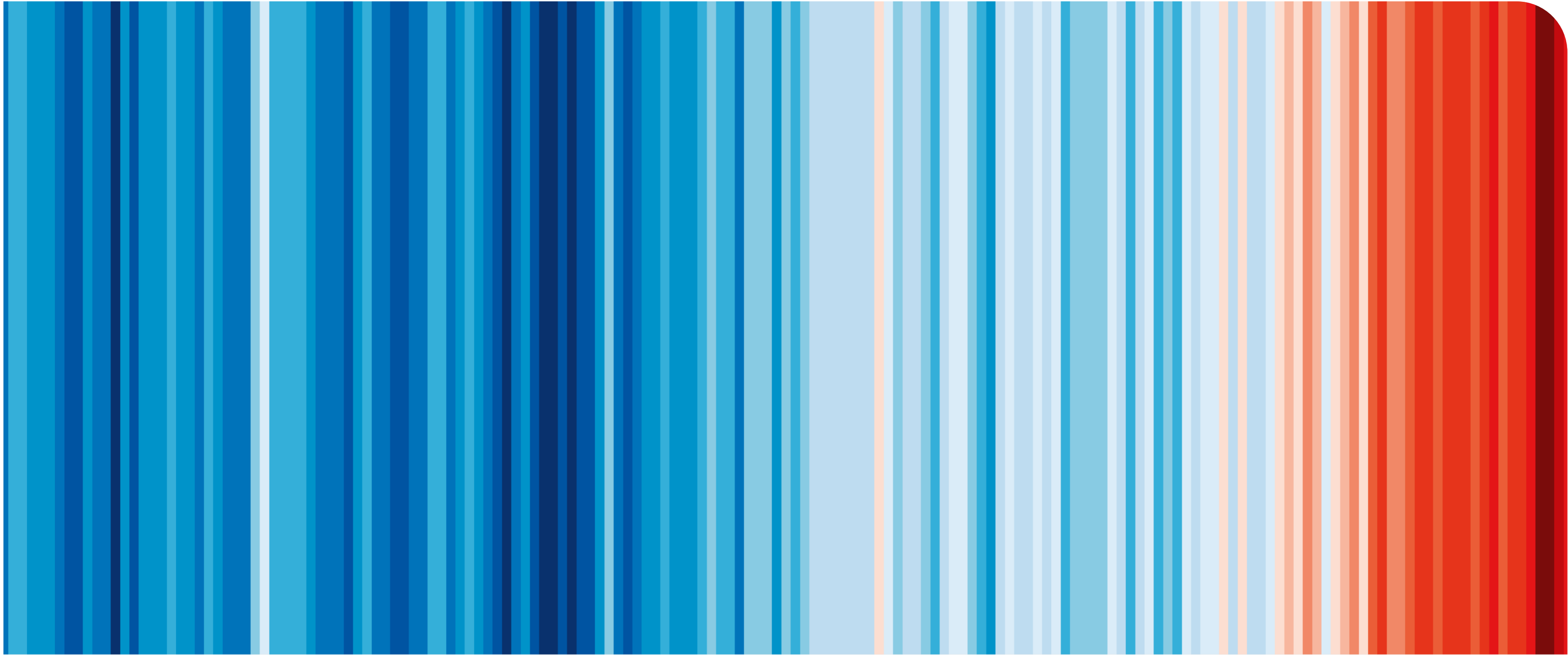
Corbion uses Life Cycle Assessments (LCA) to understand the environmental impacts of a product, from the extraction of resources to their use and end of life.

To support carbon footprint labeling for our customers, 100% of our products will be covered by an LCA by 2025.

Environmental transparency and accountability are vital for tracking progress towards a sustainable net-zero, deforestation-free and water secure future. Corbion reports its environmental data through CDP, to provide transparency to investors, customers and other stakeholders. CDP is the gold standard for corporate environmental reporting and is fully aligned with the TCFD recommendations.



- ✓ Climate change A- score
- ✓ Water B score
- ✓ Forests B score



The projections and actions included in this document have been defined based on available data and research in December 2022. Projected emissions and emission reductions may be subject to change over time.

