

BACKGROUND  
PAPER

**CLIMATE**

LAST UPDATE: APRIL 2023

**LANXESS**  
Energizing Chemistry

## MANAGEMENT SUMMARY

Climate change is humanity's biggest global challenge. It threatens not only our planet but also humans and the environment. As a responsible specialty chemicals company, we are committed to protecting the climate and limiting global warming. This is why we have made it our mission to become climate-neutral by 2040, ahead of the EU's 2050 target. Furthermore, we aim to eliminate indirect emissions in the upstream and downstream supply chain by 2050. Our ambition is in line with the goals of the Paris Climate Agreement to limit global warming to 1.5°C. For our 2030 climate targets this was confirmed by the Science Based Target Initiative (SBTi).

- 🎯 **2030 target:** Reduction of Scope 1 and 2 emissions by 80% to 1.3 million metric tons (base year: 2004) and Scope 3 emissions by 40% to 16.5 million metric tons.
- 🎯 **2040 target: Climate neutrality<sup>1</sup>** for Scope 1 and 2 emissions
- 🎯 **2050 target: Net zero<sup>2</sup>** for Scope 3 emissions

Our climate strategy is based on three key pillars:

1. Launch major impact projects for climate protection
2. Decouple emissions and growth
3. Strengthen process and technological innovations

Our responsibility for climate protection also encompasses our Scope 3 emissions. To reduce these significantly, we are focusing on the two biggest contributors to these emissions: purchased goods and the end-of-life treatment of our products. Accordingly, we are currently developing a strategy for establishing climate-neutral and circular value chains.

In our sustainability reporting, we are also committed to providing transparent information on climate issues and are seeking to expand this on an ongoing basis. In 2021, for example, we published our first index in accordance with the Task Force on Climate-related Financial Disclosure (TCFD). We have been part of the CDP initiative for more than ten years now and were again awarded an "A" rating from the CDP for our 2022 climate strategy.

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<sup>1</sup> Less than 300,000 metric tons of CO<sub>2</sub>e: The remaining emissions will be reduced through compensation measures.

<sup>2</sup> "Net zero" is achieved by a combination of positive and negative emissions during the life cycle.


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# LANXESS CLIMATE STRATEGY

Climate change is endangering humans and our ecosystems and is the biggest societal challenge of our times. Global warming is leading to increased average temperatures, rising sea levels and more frequent extreme weather events such as heavy rain, drought and heat waves. Protecting the climate is a task for society as a whole and is also anchored in the United Nations' Sustainable Development Goals (SDGs).

 Further information on LANXESS and the SDGs

Businesses have a responsibility to actively contribute toward mitigating the impact of climate change, helping to prevent negative consequences such as climate-induced property damage as well as disruptions to production and supply chains. This is why defossilization – avoiding the use of fossil sources and the associated CO<sub>2</sub>e emissions – has become a key element in a comprehensive structural change that will affect all industry sectors, the whole of society and almost all areas of our lives. This direction also decisively shapes the corporate activity of LANXESS.

As a responsible specialty chemicals company, we are committed to protecting the climate and limiting global warming through our business activities, our products and our dedication. This is why we have made it our mission to continuously reduce our greenhouse gas (GHG) emissions and become climate-neutral by 2040. This commitment is anchored in our Corporate Policy. It is in line with the goals of the Paris Climate Agreement of the United Nations Framework Convention on Climate Change to limit global warming to 1.5°C. In addition it meets the requirements of the “Green Deal,” the EU’s central climate protection roadmap, as confirmed by the Science Based Target Initiative (SBTi).

 LANXESS Corporate Policy

## LANXESS Climate Strategy



**1 Greenhouse gas management**  
Global management system, EU emissions trading system, climate reporting

**2 Scope 1 and Scope 2 emissions**  
Strategy to lower emissions

**3 Scope 3 emissions**  
Climate-neutral and circular value chains

Our climate strategy is based on the systematic and integrated management of our GHG emissions. This process also includes sustainability reporting based on national and international standards as well as the active management of climate-related opportunities and risks. The core of our climate strategy comprises a range of measures aimed primarily at reducing Scope 1 and 2 emissions. We are implementing a clear schedule for becoming climate-neutral by 2040, with specific projects based on available technologies. We are also scrutinizing our Scope 3 emissions in the supply chain and developing a strategy for establishing climate-neutral and circular value chains.

## 1. GREENHOUSE GAS MANAGEMENT

At LANXESS, GHG management takes place centrally and on a Group-wide scale. Our CEO and the Sustainability Committee, which he chairs, are responsible for monitoring and implementing the climate strategy. Two sub-committees – each headed by one member of the Board of Management – are tasked with taking a more detailed look at climate-related issues. The Climate & Energy Committee is responsible for our Scope 1 and 2 emissions and for energy efficiency. It tracks the progress of Group projects and continuously seeks to refine and enhance our climate strategy. The Value Chain Circularity & Product Stewardship Committee is responsible for formulating the strategy for handling our Scope 3 emissions. We analyze and evaluate climate-related risks and opportunities as part of our risk management process. Our CFO heads the Corporate Risk Committee overseeing this process (see Annex: Climate-related Risks and Opportunities).

 [More information on our committees and functions](#)

Since January 2021, the long-term variable compensation of the Board of Management includes not only a share but also a sustainability component, which currently takes into account the development of our GHG emissions over a four-year period. The sustainability component accounts for 40% of the long-term variable compensation.

### Global management system

Our production sites employ management systems certified under ISO 9001 and ISO 14001 to ensure that our corporate activities are legally compliant and that we meet our global LANXESS standards. In addition, we have had all our sites in Germany and Belgium certified under ISO 50001 for energy management (this corresponds to 62% of global energy consumption).

Outside Germany and Belgium, we are pursuing a strategy of regional and local certifications. In Great Britain, for example, most of our production sites are certified to the ESOS (Energy Savings Opportunity Scheme).

 [More information on our certifications](#)

### EU emissions trading system

Twelve plants at our European sites are subject to the EU emissions trading system (EU-ETS). These plants are embedded in our Group-wide energy and environmental management system. With our strategy to achieve climate neutrality, we strive to always be one step ahead of regulatory requirements – including the management of ETS certificates. Our cost effect from the ETS is currently neutral. Our climate strategy helps us to not only achieve long-term cost reductions due to greater resource efficiency, but also secure a cost advantage in European emissions trading.

### Climate reporting

For many years, we have been collecting and publishing data concerning the emissions from our own production processes (Scope 1), external energy sources (Scope 2) and the value chain (Scope 3). The ESG Data Factsheet is a compact format outlining all our climate-related targets and Key Performance Indicators (KPIs).

 [ESG Data Factsheet](#)

More than a decade ago that we joined the international CDP initiative, which evaluates climate-related risks, opportunities, targets and strategies. Since 2016, we have been awarded the top rating A by CDP for climate protection six times.

This puts LANXESS among the top 2% of more than 15,000 companies examined by the initiative in 2022. These gratifying results gave us encouragement to continue systematically pursuing our climate strategy.

 [CDP climate protection](#)

Our entire sustainability reporting concept is based on national and international standards – in particular, the principles of the UN Global Compact and GRI standards (option core). It also accords with our obligation to submit a non-financial Group report in accordance with the CSR Directive Implementation Act. In 2021, LANXESS also started reporting in accordance with the requirements of the Task Force on Climate-related Financial Disclosure (TCFD) and criteria of the Sustainability Accounting Standards Board (SASB).

 [2022 annual report \(including SASB index\)](#)

 [TCFD index](#)



#### Info box: Climate reporting

**Report boundaries:** We record the GHG emissions defined in the Kyoto Protocol and calculate the greenhouse effect in carbon dioxide equivalents (CO<sub>2</sub>e). For 100% of our fully consolidated production plants, we report on Scope 1 emissions and Scope 2 emissions (market-based) from external energy sources. Not included are emissions from minority shareholdings and leased assets such as rented warehouses and office space outside production areas. These emissions are comparatively low and are included in our Scope 3 reporting.



## Development of GHG emissions (2004–2018)

Since its founding, LANXESS has made significant progress toward climate neutrality. Between 2004 and 2018, we halved our GHG emissions – from around 6.5 million metric tons to around 3.2 million metric tons of carbon dioxide equivalents (CO<sub>2</sub>e).



We have launched a series of projects worldwide for reducing emissions and supporting local initiatives aimed at combating climate change. In 2009, a nitrous oxide reduction facility at our Krefeld-Uerdingen site was commissioned. This project is one of the main contributors to emission reductions. This has reduced CO<sub>2</sub>e emissions at the site by up to 1.5 million metric tons annually, which allowed us to achieve our reduction target for 2012 much earlier than expected. The project has received multiple awards, including the “VCI Responsible Care Award Nordrhein-Westfalen” and “365 Orte im Land der Ideen” competitions organized by the German federal government and German industry.

Since as long ago as 2007, we have constantly set new, specific reduction targets for the operational management of our CO<sub>2</sub>e emissions and energy efficiency. We achieved our GHG emissions targets in 2012 and 2015. We slightly missed our energy efficiency target in 2015 and therefore replaced it with a highly ambitious target for 2025.







### Info box: Climate targets (2007–2018)

#### Climate targets 2007–2012:



 **Scope 1 target:** Reduction of specific Scope 1 emissions in Germany by 80 % 



#### Climate targets 2010–2015:



 **Scope 1 target:** Reduction of specific Scope 1 emissions by 10% per business segment (< 0.27 metric tons of CO<sub>2</sub>e per ton of product) 

 **Energy efficiency target:** Reduction of specific energy consumption by 10% per business segment (< 2.04 megawatt hours per ton of product) 

#### Climate targets 2015–2025:

 **Scope 1 target:** Reduction of specific Scope 1 emissions by 25% (< 0.19 metric tons of CO<sub>2</sub>e per ton of product) 

 **Scope 2 target:** Reduction of specific Scope 2 emissions by 25% (< 0.35 metric tons of CO<sub>2</sub>e per ton of product) 




 **Energy efficiency target:** Reduction of specific energy consumption by 25% (< 1.72 megawatt hours per ton of product) 

## 2. SCOPE 1 AND 2 EMISSIONS

We consider ourselves to be directly responsible for our Scope 1 and 2 emissions, which is why the climate strategy we announced in 2019 initially focuses on these emissions. To achieve our goal of climate neutrality reliably and on schedule, we have set milestones with reduction targets for 2025 and 2030 formulated as absolute maximum emission limits. The Science Based Targets Initiative has confirmed that LANXESS is on the 1.5-degree path with the 2030 mid-term targets.



### Info box: Absolute climate targets (current)

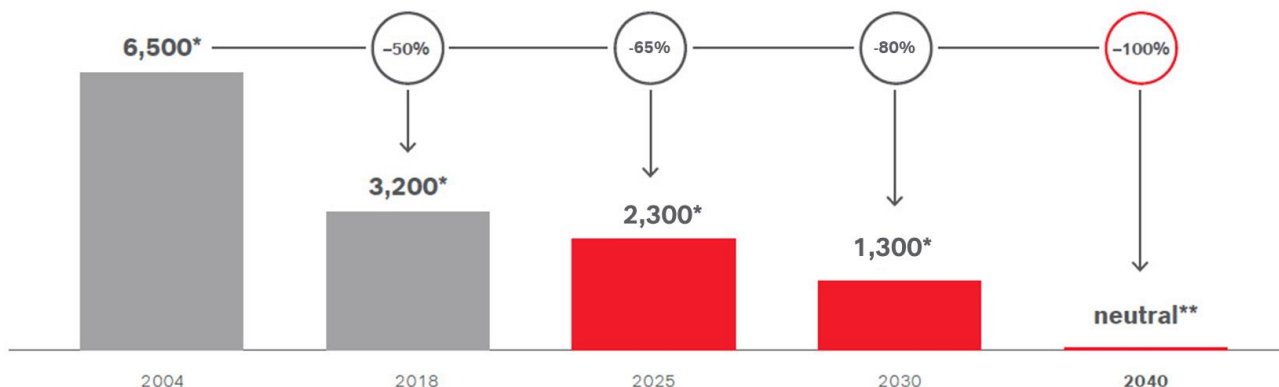
- 
**2025 target:** Reduction of Scope 1 and 2 emissions by 65 % to 2.3 million metric tons (base year: 2004)
- 
**2030 target:** Reduction of Scope 1 and 2 emissions by 80 % to 1.3 million metric tons (base year: 2004)
- 
**2040 target: Climate neutrality for Scope 1 and 2**  
**2050 target: Net-zero for Scope 3**

Since it is not technically realistic to reduce our emissions to zero, we are instead aiming to reduce our annual CO<sub>2</sub>e emissions to less than 300,000 metric tons of CO<sub>2</sub>e by 2040 and neutralize residual emissions through appropriate measures.

The only way to significantly reduce our Scope 2 emissions is by purchasing low-emission or climate-neutral energy. For this to happen, the necessary framework conditions need to be in place. The availability of renewables needs to be rapidly expanded worldwide to prevent a sharp rise in energy prices and a gap in the supply of green electricity.

Last, year we also formulated a concrete target for our Scope 3, which was accepted by the Science Based Target Initiative. (see 3: Scope 3 emissions).

**Our Journey to Climate Neutrality**  
in thousands of metric tons of CO<sub>2</sub>e



\* Scope 1 and Scope 2 emissions from CO<sub>2</sub>e in 1,000 metric tons in terms of emissions from company-owned plants and processes as well as externally acquired, such as electricity, steam, cooling or long-distance heating.

\*\* Less than 300,000 metric tons of CO<sub>2</sub>e: These will be reduced through compensation measures.

## Strategy to lower emissions

To achieve climate neutrality by 2040, we are working on three key levers.

### 1. Launch major impact projects for climate protection

We are focusing primarily on implementing a range of strategic and technical projects aimed at significantly reducing our emissions. An investment budget of €100 million will be available for these projects up to 2025. Projects that have an especially big impact on not only our CO<sub>2</sub>e emissions but also our business activities will be the first to be implemented. We are, for example, looking at alternatives to coal as a source of energy.



#### Info box: Best practice – Climate protection projects

**Climate-neutral India:** At our Jhagadia and Nagda sites in India, we are switching our entire energy supply to renewables. We are expanding our supply of biomass and solar power here and will stop using coal and gas in the future. This will help us to cut our CO<sub>2</sub>e emissions by another 150,000 metric tons from 2024 onwards.

**Cooperation with Engie:** At the beginning of 2023, we concluded a full power supply agreement with the energy company ENGIE for a total of 1,400 GWh for sites in Germany and Belgium. More than half will be covered by corporate power purchase agreements (cPPAs) with guarantees of origin for green power. The cPPAs run from January 2023 to the end of 2025, saving us around 33,000 metric tons of CO<sub>2</sub>e per year.

### 2. Decouple emissions and growth

LANXESS is growing. Despite increasing production, GHG emissions in the individual business units are set to shrink. This will be achieved not only with the help of our climate protection projects, but also in the way we control our growth projects. This means that the impact on the company's carbon footprint has become an investment criterion for organic growth and acquisitions. All the business units are responsible for their own carbon footprint. Business units that achieve above-average reductions in their GHG emissions will receive preferential treatment in the award of investment budgets.

### 3. Strengthen process and technological innovations

Since high energy efficiency improves not only our emissions footprint but also our cost position and, in turn, our competitiveness, we have decided to completely overhaul a number of our production processes. Our global energy management systematically analyzes the energy efficiency of individual plants to identify optimization potential and achieve our aim of reducing our specific energy consumption. Examples of this include the thermal upgrading of steam condensate and use of high-efficiency electric motors. To align our research activities toward climate-neutral process and technological innovations, we have set ourselves the following innovation target:



**2025 target:** Continuous further development of our production processes in order to maintain competitiveness and achieve our climate and energy efficiency targets

This target will be measured on the basis of the number of projects. In 2022, 83 projects addressing technology issues with the aim of reducing costs, improving efficiency or increasing capacity were planned. A total of 52 projects aimed at reducing emissions were implemented, including various initiatives designed to increase energy efficiency in production processes by recycling steam or replacing equipment. The projects reduce our annual emissions by a total of around 15,000 metric tons of CO<sub>2</sub>e.

Since it is not technically realistic to reduce our energy requirements to zero, we are instead looking to cover demand through renewables. At our Porto Feliz site in Brazil, for example, we already commissioned a highly efficient heating plant back in 2010 to generate electricity and steam using biomass such as wood scrap from sustainable forestry. When sourcing the latter, we make sure that no forests are cut down to meet our energy needs, and no land previously used for food production is converted. This renewable resource enables CO<sub>2</sub>-neutral energy generation because it emits only as much CO<sub>2</sub> as the trees absorb during growth. And as part of the purchasing process at all our sites, we investigate the viability of entering into new energy supply contracts with reduced GHG emissions.





**Info box: Best practice – Processes and technologies**

**“Verbund” structures:** At our large networked sites, plants often transmit surplus heat to a neighboring plant, which reduces the overall demand for external heat. One example at our Leverkusen site is the hydrazine hydrate plant run by Advanced Industrial Intermediates, which supplies the neighboring sulfuric acid plant with hot steam condensate. Using its surplus heat, this plant, in turn, produces steam, which is then fed back into the site’s steam supply system.

**Digitalization:** In 2020, at our phosphorous chemicals plant run by Polymer Additives in Leverkusen, we developed a new program enabling the live simulation of production processes. The underlying data enables us to compare theoretical steam consumption with the actual volume. This allowed us to reduce steam consumption by 600 kg per hour, equivalent to almost 4,000 metric tons of CO<sub>2</sub> per year – with room for further improvement.

**Steam plant network:** In 2019, at our site in the Port of Antwerp in Belgium, we commissioned a steam plant network in partnership with other chemicals companies based there. This network helps us to not only save energy costs but also reduce our CO<sub>2</sub>e emissions by around 10,000 metric tons per year. When you consider the emission reductions achieved by all the companies in this network, the figure for total annual CO<sub>2</sub>e savings is as high as around 100,000 metric tons.

**Status 2022: Road toward climate neutrality**

In 2019, we significantly reduced our emissions due to a range of efficiency measures, an improved product mix and a bigger share of renewables. Selling our leather chemicals business also had a positive impact on our GHG emissions. This sale was split into three stages and was reflected for the first time proportionately in the emission figures for 2020. In addition, our Group projects in Nagda in India, for example, are showing initial signs of success (see “Best Practice – Climate protection projects”).

For 2021, the emission values are slightly higher than in the previous year. Our savings did not fully compensate for the recovery from the Corona pandemic and the portfolio effect from the acquisition of Emerald Kalama Chemicals and Theseo. Scope 1 and Scope 2 emissions would have amounted to 2,739 for the full year 2021 based on the current portfolio with Emerald Kalama Chemicals and Theseo Group.

For 2022, we were able to reduce emissions significantly to 1,994 kt. This is mainly due to portfolio changes. In 2022, HPM was consolidated at 472kt in 2022, which significantly overcompensated for the full-year effect of the EKC Acquisition as well as the IFF Acquisition. In addition, we saw a significant decrease in emissions due to a reduction in production volumes as a result of the very tense global energy situation.

Our emissions of 1,994 kilotons of CO<sub>2</sub>e in 2022 represent a 70% reduction compared to 2004, so we are well on our way to achieving our goal of reducing our emissions by 80% by 2030.

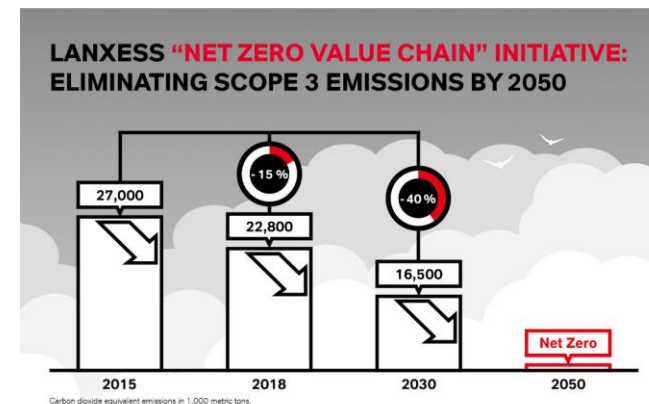
Based on our Group strategy, we are currently in the process of deriving a range of measures for the individual business units aimed at decoupling growth from GHG emis-

sions. As part of this process, we are preparing the next series of Group projects aimed at ensuring the continued reduction of our GHG emissions beyond 2025.

**3. SCOPE 3 EMISSIONS**

**Our journey towards climate-neutral and circular value chains**

LANXESS is taking the next step in climate protection and has set a target for Scope 3 emissions: The Group aims to make its upstream and downstream supply chains climate-neutral by 2050. This includes indirect emissions, particularly from purchased raw materials, but also from logistics and end products. By 2030, Scope 3 emissions are to be reduced by 40 percent compared with the base year 2015, from 27,000 to 16,500 kilotons of CO<sub>2</sub> equivalents.



LANXESS' climate targets for Scope 1, 2 and 3 are in line with the Paris Climate Agreement. This has been confirmed by the renowned Science Based Targets Initiative (SBTi). The joint initiative of the climate protection organization

CDP, the UN Global Compact, the World Resources Institute and the World Wide Fund for Nature has validated the Group's targets for reducing its emissions and certified that we are contributing to limiting global warming to a maximum of 1.5 degrees Celsius.

To achieve its Scope 3 targets, LANXESS has launched the Net Zero Value Chain Program. This strategy towards climate neutrality along the entire supply chains is based on three pillars:

- Sustainable raw materials: LANXESS is changing the way it purchases raw materials and is increasingly sourcing sustainable raw materials that are of plant origin, come from a recycling process or are produced using renewable energies. Current examples of these raw materials include sustainably produced cyclohexane for starch-based polyether polyols for Adiprene brand prepolymers.
- Green logistics: The carbon footprint is weighted more heavily than before when selecting means of transport. LANXESS also wants to make use of innovative solutions, such as "green" inland and deep-sea logistics with sustainable drive systems. Improved logistics planning is also intended to ensure higher utilization of freight capacity, optimized interaction between different modes of transport, and less need for transportation.
- Climate-neutral products: LANXESS is expanding its range of climate-neutral products and solutions with a low carbon footprint. Since fall 2021, these products have been given the "Scopeblue" brand label. Examples include trimethyl-olpropane (TMP), about half of which is made from sustainable raw materials, and the composite material Tepex, which is based on flax and lactic acid. In

the medium term, LANXESS intends to offer emission-reduced and climate-neutral variants for all its products. The goal is to have exclusively climate-neutral products in its portfolio by 2050. LANXESS also wants to quantify the carbon footprint of all its products.

When calculating our production-related Scope 3 emissions, we include only the carbon footprint of our products and not any CO<sub>2</sub> savings during their use – for example, CO<sub>2</sub> savings achieved in the transport sector thanks to materials used in the field of electric mobility. Additives that increase the lifetime of wooden or plastic consumer goods also help to reduce CO<sub>2</sub>.

For more information on our Scope 3 emissions, see our CDP report.

### Scope 3 emissions (2021)



The lion's share of our Scope 3 emissions consists of goods that we purchase. Here, in particular, alternative raw materials – whether renewable, recycled or bio-based – have a much lower carbon footprint than non-renewable raw materials because they are not fossil-based but grow naturally and thereby bind CO<sub>2</sub> from the atmosphere. In addition, it is

more CO<sub>2</sub>-efficient to recycle waste than to simply incinerate it. So, closing value chains by using alternative raw materials and recycling waste constitute key factors in the ability to reduce Scope 3 emissions over the long term. Despite their different priorities, climate neutrality and the circular economy go hand in hand.

As a leading specialty chemicals company, we understand the major challenges facing our suppliers in particular, but we also view the circular economy as an opportunity to transform the entire value creation system and create a resource-efficient, carbon-neutral economy. This encompasses the entire product lifecycle – starting with the use of raw materials, through the utilization phase of the products, to their resource-saving, environmentally friendly recycling.

The chemical industry is a pioneer of the circular economy. Of vital importance here is chemical recycling, a process whereby unsorted, mixed waste streams are transformed into raw material for the chemical industry. For our part, we are currently conducting research into different chemical recycling methods for our products. We have already made considerable progress here, for example in the recycling of polystyrene insulating foam formulated with flame retardants.

More information on the circular economy at LANXESS

### Cooperation along the value chains

To reduce Scope 3 emissions, cross-industry cooperation is essential. Only through the cooperation of partners along the entire value chain can solutions for low-carbon or carbon-neutral raw materials and end-of-life treatment methods become established.

Our suppliers play an especially important role here, which is why we collaborate with them very closely and, as part of our supplier management system, gather information on their energy efficiency and climate protection performance as well as on the improvement measures that they implement. The framework for this collaboration is the “Together for Sustainability” (TfS) initiative, of which we are a founding member. Thanks to our efforts to reduce emissions in our supply chain, we were awarded in 2021 and 2022 as part of the 2020 Supplier Engagement Rating Leader by the CDP. This puts us among the top 5% of companies in this rating.

 More information on the “Together for Sustainability” initiative


 More information on the “Supplier Engagement Rating”

To intensify our collaboration with key industry players, we participate in a number of multi-stakeholder initiatives including “Factor 10”, “International Sustainability and Carbon Certification” (ISCC) and “Circular Cars”.



#### Info box: Multi-stakeholder initiatives

**“Factor 10”:** This initiative, which was launched by the “World Business Council for Sustainable Development” (WBCSD), works on the basis that a sustainable future is possible if the eco-efficiency of materials is improved more than tenfold.

 More information on “Factor 10”

**“International Sustainability and Carbon Certification” (ISCC):** The ISCC initiative aims to introduce and continuously develop a sustainability standard that covers the entire value chain – from the raw material to the OEMs and brand owners.

 More information on the ISCC initiative

**“Circular Cars”:** The members of this initiative seek to eliminate or minimize emissions from the automotive industry across the entire lifecycle. The initiative was launched by the world economic forum, EIT Climate-KIC and numerous other partners.

 More information on the “Circular Cars” initiative

Another key element in promoting partnerships is engaging in active dialog with our stakeholders. At our stakeholder roundtable in November 2020, we got together with a number of leading climate experts from business and society to discuss a range of central climate issues – including the reduction of GHG emissions not only in our own production facilities but also along the entire value chain. This strengthened our conviction that it will become ever more important in the future to take responsibility for our Scope 3 emissions.

 More information on our stakeholder dialog

## ANNEX: CLIMATE-RELATED RISKS AND OPPORTUNITIES

### Management of risks and opportunities

At LANXESS, we take into account the physical and transitional risks associated with climate change and apply the TCFD framework in our efforts to manage them. Physical risks include acute and chronic risks. Transitional risks may be regulatory, reputation-based or market-based. Identifying, analyzing and evaluating climate-related risks and opportunities are all part of our Group-wide risk and opportunity management process. The Corporate Risk Committee, which is headed by our CFO, is responsible for managing this process and for monitoring and controlling climate-related risks and opportunities. You can read all about the process, the functions and committees responsible and examples of climate-related risks and opportunities in our CDP report.

 CDP climate change

### Risks

#### Acute physical risks

Relevant corporate functions are informed immediately in the case of an acute physical, climate-related event. Stage-1 events of this kind trigger a range of emergency plans and communication measures, which are coordinated by an Emergency Response Officer. One of our Indian production sites, for example, is situated in a region exposed to potentially very extreme weather. To ensure that we are prepared for this risk, we have developed countermeasures and taken out insurance to cover the residual risk.

#### Chronic physical risks

Extreme weather events are among the key features of climate change. Potential negative consequences include disruptions to supply chains, for example due to drought or flooding or key waterways becoming impassable to shipping. Our production sites in Leverkusen, Dormagen and Krefeld-Uerdingen lie on the banks of the Rhine, which is expected to suffer in the future from prolonged periods of low water levels. If shipping needs to be stopped due to low water levels, we need to find alternative distribution ways for transporting our high-volume products and for the delivery of raw materials. Our supply chain management system monitors the water level of the Rhine continuously and assesses the situation. In the event of delivery problems, the supply chain structure is immediately adjusted and, for example, intermodal transport systems are used.

#### Regulatory risks

Every year, we assess the currently applicable country-specific, regulatory requirements and specifications that we might be confronted with. We analyze their direct and indirect financial, organizational or strategic impact on our sites, production processes, supply chains and products and implement the necessary measures. The Corporate Development department then applies the findings of these analyses to the strategic evaluations of investment decisions. One example here is the CO<sub>2</sub> pricing system, which has yet to be standardized globally. If facilities operated by LANXESS are subject to these requirements and regulations, for example, while sites run by our competitors are not, the comparatively higher costs could potentially put us at a competitive disadvantage.

#### Reputation-related risks

For every risk we identify, we have to determine the reputational risk in our risk management system. The risk is classified qualitatively and includes, for example, the impact on the trust of our stakeholders. LANXESS as a company has a large carbon footprint, amounting to more than ~20 million metric tons of CO<sub>2</sub>e annually for Scope 1, 2 and 3 emissions. Our portfolio also includes products associated with high GHG emissions. As a global specialty chemicals company, we are expected to respond proactively. If we fail to systematically shift our business activities toward sustainability and climate neutrality, this could endanger our reputation, potentially resulting in declining sales and a poor market valuation.

#### Market-based risks

As a chemicals company, we are part of some very long value chains and manufacture source materials for downstream production processes. We are constantly identifying, analyzing, evaluating and managing future trends in sustainability and low-carbon technologies in downstream markets. In particular, the launch of the “European Green Deal” will have a major impact on our sales markets (e.g. in relation to recycling). If we fail to optimize our portfolio, we will lose market shares.

## Opportunities

All market-related risks simultaneously entail a range of opportunities – for example, our high-performance plastics are already suitable for all recycling routes. Some of our products are already manufactured from recycled raw materials. In this way, the market risk associated with the “Green Deal” also becomes a market opportunity.

As a specialty chemicals company, we are in a position to drive forward innovation and offer new solutions. Thanks to our technological knowhow, we are in a position to employ climate-friendly methods to manufacture materials that help to mitigate the impact of climate change and are needed in the response to changing circumstances.

Our R&D strategy has three key areas of focus:

1. To reduce the carbon footprint of our products, we initiate a range of process- and technology-related R&D projects.
2. To manufacture the products needed for defossilization, we drive forward R&D projects together with our customers.
3. Together with our customers, we develop chemical products that are needed in the response to, and for mitigating the impact of, climate change.



### Info box: Best practice – Fighting climate change

#### Products that help in the fight against climate change:

Electric mobility and batteries play a key role in defossilization. Our specialty thermoplastics are used in the manufacture of battery housings in, for example, electric vehicles. We also manufacture the basic components for the electrolyte in the battery. Our partnership with Tinci Materials Technology Co., a manufacturer of lithium-ion battery materials, sees us taking our first steps into the field of electrolyte manufacturing in Leverkusen. We believe that lithium batteries will penetrate the market quickly, enabling not only zero-emissions mobility but also decentralized energy production and storage. In another partnership with the Canadian company Standard Lithium Ltd., we have together built in El Dorado, USA, a pilot plant for extracting and treating lithium salt.



[More information on electric mobility](#)



[More information on our partnership with Tinci](#)

#### Products that facilitate the response to climate change:

Increasing water scarcity is among the negative consequences of climate change. Our water treatment technology is one example of a product that helps to mitigate the impact of climate change. Thanks to our LewaPlus® software, we enable our customers to optimize their water treatment plants. This minimizes the use of chemicals and water and thus the CO<sub>2</sub> footprint of the water treatment.



[More information on our LewaPlus® software](#)

# GLOSSARY

**Carbon dioxide equivalents (CO<sub>2</sub>e):** A metric measure for standardizing the climate impact of various GHGs based on their global warming potential (GWP). This measure indicates how much a specific mass of a GHG contributes to global warming compared with the same mass of CO<sub>2</sub>. So the GWP of methane (CH<sub>4</sub>), for example, is 25 and that of nitrous oxide (N<sub>2</sub>O) is 298, which means that 1 million metric tons of N<sub>2</sub>O causes as much climate damage as 298 million metric tons of CO<sub>2</sub>.

**Carbon Disclosure Project (CDP):** The aim of the non-profit organization CDP is to create global transparency in terms of GHG emissions and the management of water resources and forests. In 2021, more than 13,000 companies submitted their data to the CDP. The CDP platform is one of the world's most detailed sources of environmentally relevant information.

**CSR Directive Implementation Act (CSR-RUG):** In 2017, the Act transposed the Corporate Social Responsibility EU Directive into German law. It defines reporting requirements in particular for large listed companies with more than 500 employees. These companies are required to disclose important non-financial aspects of their corporate activities. The Act requires information on environmental, social and employee-related matters as well as on the observation of human rights and the fight against corruption and bribery.

**Defossilization:** This term refers to the balance of the carbon footprint (CO<sub>2</sub> input and removal from the atmosphere) primarily by preventing the use and combustion of fossil fuels.

**EU emissions trading system (EU-ETS)<sup>1</sup>:** This covers the emissions of around 11,000 plants in the energy sector and energy-intensive industrial sector throughout Europe, which are together responsible for emitting around 40% of Europe's GHGs. In 2018, the 1,870 plants in Germany that have signed up to the EU-ETS emitted almost 422 million metric tons of CO<sub>2</sub>e, with around 70% of this figure originating from power plants. With 124 million metric tons of CO<sub>2</sub>e, the iron and steel industry accounts for the lion's share (30%) of industrial emissions, followed by the mineral processing industry (29%), refineries (20%) and the chemical industry (14%).

**European Green Deal:** This outlines a comprehensive EU growth strategy for a climate-neutral and resource-conserving economy. The primary aim is to achieve EU-wide climate neutrality by 2050 through measures such as climate, environmental and biodiversity protection, mobility, industrial policy and requirements relating to energy, agricultural and consumer protection policy.

**Global Reporting Initiative (GRI):** A non-profit multi-stakeholder foundation, founded in 1997, that offers guidelines for sustainability reporting. Depending on the scope of information contained in a report, two options – “core” and “comprehensive” – are available for preparing a sustainability report in accordance with the GRI standards.

**Greenhouse gases (GHGs):** GHGs are gases that contribute to the greenhouse effect through the absorption of infrared radiation. GHGs include carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), fluorinated hydrocarbons (HFCs), perfluorocarbons (PFC) and sulfur hexafluoride (SF<sub>6</sub>).

**Paris Climate Agreement:** The legally binding Paris Agreement sets a global framework for limiting global warming to well below 2 °C – though preferably below 1.5 °C – compared with pre-industrial levels. The Agreement was reached in 2015 at the Paris Climate Conference (COP21) and is a continuation of the 2005 **Kyoto Protocol**, which expired in 2020 and defined for the first time a set of binding targets for the emission of GHGs. The Paris Climate Conference was the 12<sup>th</sup> “Conference of the Parties” (COP) since the targets defined at the United Nations Framework Convention on Climate Change entered into force in 1994.

<sup>1</sup> Sources: European Commission, EU emissions trading system, German Emissions Trading Authority, GHG emissions in 2018



**Science Based Targets Initiative (SBTi)**

The Science Based Targets Initiative is a collaboration between CDP, the United Nations Global Compact, the World Resources Institute, and the World Wide Fund for Nature. It was established to help companies set emissions reduction targets consistent with climate science and the goals of the Paris Agreement. Since 2015, more than 1,000 companies have joined the initiative to set a science-based climate target.

**Scope 1 emissions:** These are all direct GHG emissions from sources owned or controlled by the company. These are above all process emissions and emissions from self-generated energy. Our Scope 1 emissions include carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>) and fluorinated hydrocarbons (HFC) emissions, which are calculated in the form of CO<sub>2</sub> equivalents (CO<sub>2</sub>e). Perfluorocarbon (PFC) and sulfur hexafluoride (SF<sub>6</sub>) emissions are also counted as GHG emissions, but are not relevant to LANXESS.

**Scope 2 emissions:** These are all indirect GHG emissions resulting from the generation of purchased electricity and steam as well as from purchased heating and cooling energy that is used by a company. Our Scope 2 emissions mainly comprise CO<sub>2</sub> emissions. Since 2016, in accordance with the guidelines set out in the Greenhouse Gas Protocol, companies have been required to be more explicit in how they indicate their Scope 2 emissions. A distinction is made between two different recording methods:

- > **Market-based:** Market-based figures relate to the emission factors of the energy supplier or an individual energy product.
- > **Location-based:** Location-based figures relate to the average emission factors of the region in which the energy is consumed. The nationwide average is usually used as a basis here.

**Scope 3 emissions:** These are all indirect GHG emissions from activities along the value chain, originating from sources that are not owned or controlled by the company. These generally account for the majority of the carbon footprint and include emissions generated during purchasing, transportation, waste disposal and business trips.

**Supplier Engagement Rating (SER):** To reflect the importance of engaging suppliers, companies that respond to the full version of the CDP questionnaire are awarded – in addition to their general rating – a Supplier Engagement Rating (SER). The SER indicates how effectively companies engage their suppliers in the fight against climate change.

**Sustainability Accounting Standards Board (SASB):** This non-profit organization was founded in 2011 and develops industry-specific standards relating to key environmental, social and governance issues.

**Task Force on Climate-related Financial Disclosure (TCFD):** The Financial Stability Board founded the TCFD as a way of helping companies to integrate the risks and opportunities associated with climate change in their business activities and to report on climate-related financial information.

**United Nations Global Compact:** The world's biggest and most important initiative for responsible corporate governance. Based on 10 universal principles, it pursues the vision of an inclusive and sustainable global economy for the benefit of all people, communities and markets. Signatories are obligated to submit an annual progress report.

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