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# BASF VISION AND TARGETS



The transition toward a sustainable world is a fundamental challenge of the 21st century. For BASF, climate protection is a key task and an essential part of our strategy.

By as early as 2030, BASF intends to reduce its Scope 1<sup>1</sup> and 2<sup>2</sup> greenhouse gas (GHG) emissions worldwide by 25%, against a 2018 benchmark. And despite the growth of our business, BASF is committed to net zero carbon dioxide (CO<sub>2</sub>) emissions by 2050.

Scope 3<sup>3</sup> climate goals underscore BASF's determination to adhere to the principles of the Paris Agreement. We set for ourselves a 15% reduction in Scope 3.1 emissions by 2030 and net zero by 2050.

BASF is committed to economically efficient and ecologically effective global climate protection, and supports the UN Sustainable Development Goal of **Climate Action**.



UNITED NATIONS  
**PARIS CLIMATE  
AGREEMENT**

We also support the objective of the **Paris Agreement to limit global warming to below 2 degrees Celsius**. This can be successfully achieved only by working together, in dialogue with **policy, business and society**, as well as in strong partnerships for **climate protection**.

- 1 Direct emissions from sources owned or controlled by the company
- 2 Indirect emissions from purchased electricity, steam, heat, and cooling
- 3 All other emissions associated with a company's activities, including those that are not produced by the company itself, but are the result of activities from assets it's indirectly responsible for up and down its value chain
- 4 Corresponds to a reduction from 1.57 to 1.34 kilograms of CO<sub>2</sub>e per kilogram of raw material bought; calculated on the basis of relevant Scope 3.1 emissions of 48 million metric tons

We create chemistry for a sustainable future - BASF's emission targets

2030

25%

Scope 1 and Scope 2  
CO<sub>2</sub> emission reduction  
(compared with 2018)

15%

specific Scope 3.1  
CO<sub>2</sub> emission reduction  
(compared with 2022<sup>4</sup>)

net zero

Scope 1, Scope 2  
and Scope 3.1  
CO<sub>2</sub> emissions

2050

## Technology and innovation

**BASF's solutions can be an accelerator for many of these innovations.** Several initiatives for reducing CO<sub>2</sub> emissions in the chemical industry are being implemented at BASF. These include:

- Electrically heated **steam cracker** furnace.
- CO<sub>2</sub>-free **production of hydrogen** and **steam**.
- **Power Purchase Agreements** for sites like Freeport, TX.
- **Advanced Process Control** to optimize and improve the efficiency of our manufacturing units through advanced algorithms and real-time data analysis.

One way that we live up to our responsibility for climate protection is through our products, which enable our customers to lower CO<sub>2</sub> emissions. We also want to become more efficient in our production and energy use, increase our use of renewable energies and accelerate the development and deployment of new CO<sub>2</sub>-free processes for the production of chemicals.

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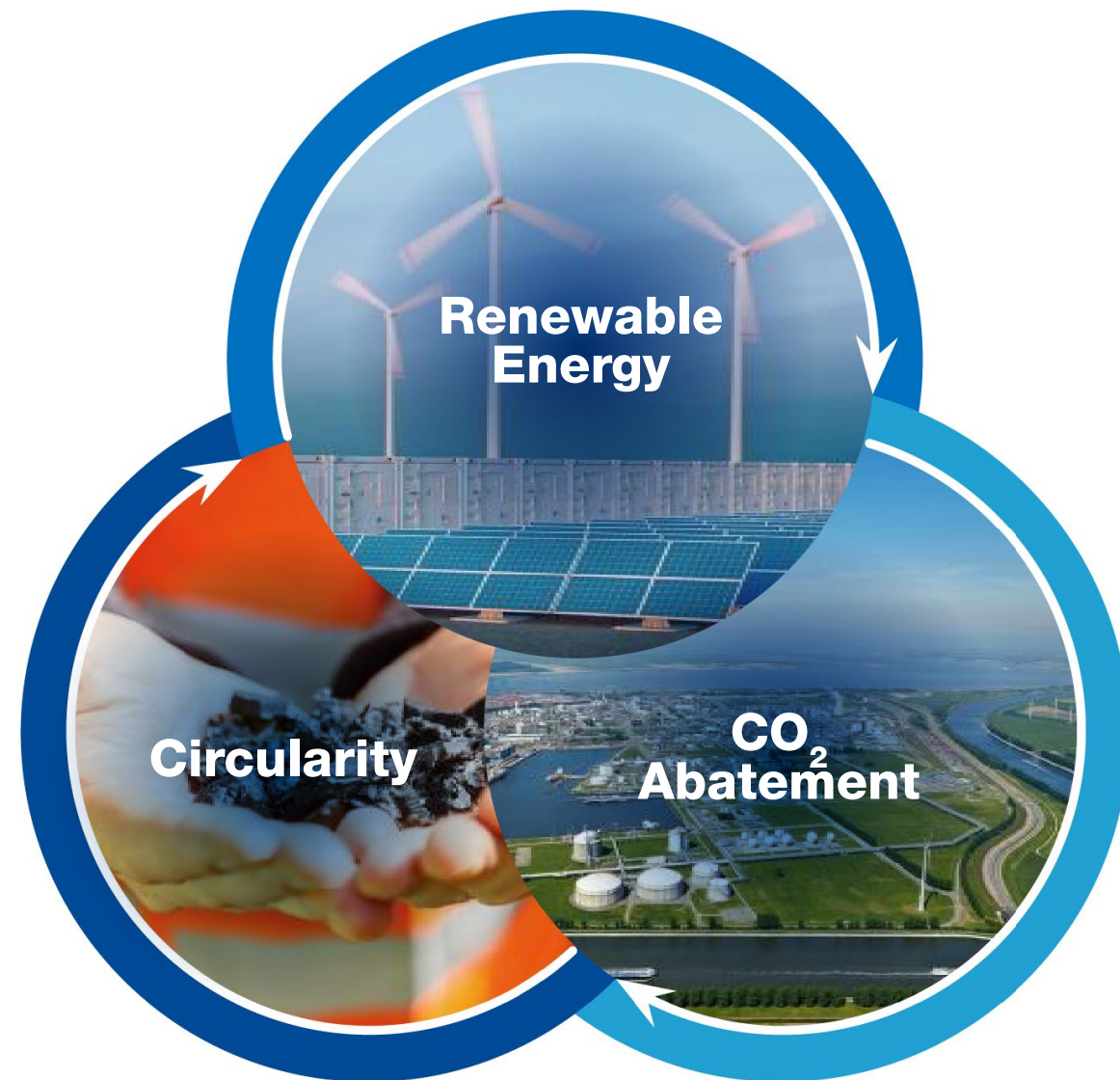
## Supply chain

To serve our customers with the lowest carbon footprint materials possible, focusing on Scope 1 and 2 emissions is not enough. To address Scope 3.1 emissions, we have invited our suppliers to join our Supplier CO<sub>2</sub> Management Program.



**On average, around 70% of the carbon footprint of our products originates from our purchased raw materials, which constitute upstream Scope 3 emissions.**

In this program, we first aim to achieve transparency concerning the CO<sub>2</sub> emissions of our purchased raw materials. We offer our support and share our knowledge of product carbon footprint (PCF) valuation methodologies and tools with our suppliers. In the improvement phase we will jointly identify levers and targets to reduce these GHG emissions.







### Customers and stakeholders - we're open for collaboration!

BASF focuses on developing sustainable solutions for differentiation from competitors and supporting the success of our customers in their respective markets. Along with our raw material suppliers, our customers reflect the downstream efforts of our solutions and the environmental impacts that we work to minimize.

For BASF, it's important to have a continuous dialog with various stakeholder groups. We leverage the expertise of our stakeholders in our own advisory bodies, global networks and worldwide initiatives. As a founding member of the U.N. Global Compact more than 20 years ago, we consistently support responsible business and the Sustainable Development Goals.

**BASF has established a new stakeholder engagement format that we call the SUSTAINABILITY LAB.**



**The Sustainability Lab is a development of the Stakeholder Advisory Council through which we can explore specific sustainability topics that are becoming ever more complex. At the first meeting in July 2023, participants discussed what BASF and other stakeholders can do to contribute to a successful energy transition.**



# INDUSTRY FOCUS



A major obstacle in reducing the carbon footprint of the industrial sector is that carbon is an indispensable component of everything we manufacture. Implementing circular economy principles to optimize the use of fossil resources and shift towards renewable and circular materials creates a positive impact for our customers and the planet.

**The climate is changing**, natural resources are becoming scarcer, pressure on ecosystems is increasing and our growing world population needs to be fed. More urgently than ever, solutions are needed for a sustainable future. In almost all areas of life, chemistry can pave the way to greater sustainability and **accelerate the transformation** needed to achieve this.

Our innovative products, solutions and technologies help to improve quality of life and **protect the environment** as well as the climate. We achieve this by using raw materials more efficiently, reducing waste and aligning our actions with the circular economy principle. For example, we are:

- Using **recycled and waste-based raw materials** in our production and also recycling operating supplies.
- Expanding our capacities for **recovering precious metals** from spent automotive and industrial catalysts.
- Developing cross-industry, **product-specific recycling technologies** to avoid plastic waste and strengthen the circular economy.

At the same time, BASF is also undergoing profound changes. We are:



Transforming our company and breaking new ground to achieve climate neutrality.



Facing up to the challenge of making this change socially just.



Managing long-term policy decisions and current geopolitical conflicts.



# CONSUMER GOODS



Together with customers, we are working on consumer products that are manufactured using renewable and chemically recycled raw materials. We can manufacture virgin-quality products while saving fossil resources and reducing CO<sub>2</sub> emissions by using mass balanced circular feedstocks.

## Steelcase Flex Perch Stool

BASF collaborated with leading furniture manufacturer Steelcase to create the Flex Perch Stool. This represents Steelcase's first furniture product made from advanced recycling processes.

The stool is composed of **BASF's Ultramid® Cycled polyamide**, made from pre- or post-consumer waste streams previously destined for landfill or incineration. This provides a one-for-one replacement for fossil-derived plastics.

## BVERDE® GP 790 L Biodegradable Polymer in Liquid Laundry



BVERDE® is a new-to-market, 79% biobased, biodegradable, grafted polysaccharide polymer for anti-redeposition in liquid laundry applications.

The current market incumbent ingredient for anti-redeposition is polyacrylic acid (PAA), which is not biodegradable. BVERDE® offers performance parity with PAA without compromising sustainability.





### Lupranate® T80 with Biomass Balanced

Flexible polyurethane foams made with Lupranate® T80 are used in bedding mattresses, furniture, and automotive seating. BASF recently **introduced a 100% biomass balance (BMB) material** for these important industry segments. Lupranate® T80 BMB is one of the first BASF BMB products made in North America, and is very important to fulfill the downstream market demand for more sustainable flexible polyurethane foam materials.

In fact, furniture retailers are helping to drive the change to more sustainable products for their seating and bedding portfolios. Furthermore, automotive OEMs like Ford and GM have already communicated targets to their suppliers to reduce the carbon footprint of their products over the next ten years.

To help achieve these ambitious goals, we know flexibility for our customers is critical. BASF offers **domestically produced biomass balance isocyanate products out of its Geismar, United States Verbund plant. The ability to use Lupranate® T80 BMB and other BMB isocyanates without separate storage tanks or the need for reformulation, coupled with the flexibility to mix them with conventional isocyanates**, is a true differentiator.

### HySorb® Biomass Balanced

BASF's HySorb® superabsorbent polymers are a key component of hygiene products like baby diapers and adult incontinence products.



**HySorb Biomass Balanced is a high-performance superabsorbent solution using renewable raw materials.**

With HySorb® Biomass Balanced we have created a ready-to-use drop-in solution, requiring no adaptation of a diaper production line with no compromise on product quality and performance. It allows our customers to define their own sustainability targets, saving fossil resources and reducing greenhouse gas emissions.







## TRANSPORTATION



We supply high-performance cathode active materials (CAM) for electric vehicle batteries and are creating a sustainable battery materials value chain from refining to recycling.

### Battery recycling

Circular economy means decoupling growth from resource consumption. BASF facilitates a circular economy by making the most of the planet's limited resources. We keep materials in use for as long as possible, minimize waste, and create value with renewable resources.

For the automotive industry, our ambition is to “close the loop” on lithium-ion battery recycling. To that end, we provide in-depth chemical and process engineering experience to ensure sustainable and cost-competitive solutions for metals extraction.

Battery recycling is an important long-term requirement in the EV market to reach a circular economy and reduce CO<sub>2</sub> footprints. With extensive in-house recycling expertise, we have developed innovative steps for battery recycling. BASF R&D is addressing unmet needs in the battery recycling industry, such as high-efficiency lithium extraction. **Our focus on development of new sustainable production processes provides a unique advantage in the recycling value chain, ensuring supply of critical metals for new batteries.**

BASF's closed-loop offering produces a best-in-class CO<sub>2</sub> footprint. Our energy-efficient manufacturing technology and use of renewable energy in cathode active materials production, combined with the use of recycled materials, offer outstanding levels of CO<sub>2</sub> reduction.

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## Nypel® RC grades

OEMs in the transportation sector are looking for ways to reduce their CO<sub>2</sub> footprints. They also seek to find longer-term end-of-life solutions to reintroduce waste feeds back into a truly closed-loop economy. **Nypel® RCs are recycled grades of nylon 6 and 6.6 resins that expand BASF's Engineering Plastics portfolio.** They contain post-consumer recycled (PCR) carpet and can be formulated to contain virgin resins, additives and fillers to deliver a wide range of properties to meet specific performance needs. **Nypel® RC supports our North America OEM customers to meet upcoming regulations for sustainable material use in transportation, specifically recycled content.**

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## Sustainable Automotive OEM Coating Solutions

Through its GLASS tool (Global Life Cycle Assessment of Automotive Surface Solutions), BASF's Coatings division offers **an analysis approach that enables transparency and supports customers in making informed decisions for sustainable surface solutions.**



**GLASS tool's scope goes beyond CO<sub>2</sub>: With this transparency, customers can optimize their costs, performance, and ecological footprint at the same time.**

Additionally, BASF can provide targeted advice and develop solutions together with our customers. These solutions include CO<sub>2</sub>-reduced technologies at the beginning of the value chain, such as a biomass balance approach using renewable raw materials; or technologies that have a CO<sub>2</sub>-reducing effect when applied, like shortened processes, or material- and energy-efficient E-coats.

# HEALTH AND NUTRITION



We are setting new standards in pharmaceuticals and animal nutrition with products that increase efficiency and minimize emissions.

10%

Reduction in  
ibuprofen product  
carbon footprint

## Ibuprofen

BASF is striving to make the world's most environmentally friendly ibuprofen. For over 25 years, BASF has been manufacturing ibuprofen at its FDA-audited, cGMP-certified site in Bishop, Texas, offering a portfolio that delivers unparalleled **quality, safety** and **security of supply**. Customers can count on BASF as the sustainable supplier of choice for their bulk ibuprofen needs.

To decrease our footprint, we purchased renewable energy to compensate for our full 2023 electricity consumption at Bishop. We have purchased renewable energy credits (RECs) for our ibuprofen production, resulting in an approximate 10% reduction of our product carbon footprint.

## Vitamins A and E

BASF is a leading producer of synthetic vitamins A and E. With decades of experience, we have developed a science-based, high-quality product range to support healthy nutrition in people and animals.

Using BASF's Strategic CO<sub>2</sub> Transparency Tool, we calculated product carbon footprints for all vitamin A and E products. For select product grades for use in animal nutrition, Lutavit® A 1000 NXT and Lutavit® E 50, our PCFs are more than 20% better than the global market average, as evaluated internally based on estimated nameplate capacities without BASF.

These results were certified externally through TÜV Rheinland according to ISO 14067:2018 in July 2023, confirming the calculation of benchmarks based on BASF data from July 2023. These benchmarks are valid for three years unless changes in data or assumptions occur, and support our customers in sourcing vitamins A and E with certified product carbon footprint data.





# AGRICULTURE



We help farmers tackle the most pressing climate challenges with the right combination of technologies designed to increase yield, make farm management easier and more effective, and reduce environmental impacts.

## Cleanfarms and IrgaCycle®

With our partners at Cleanfarms, **BASF supports the collection and recycling of the plastics used in agriculture to drive a circular economy.** Each year, Cleanfarms collects and recycles millions of empty containers from farmers across Canada.

BASF and Cleanfarms are collaborating on research into recycling old containers back into new containers. Using recycled plastics in agricultural applications requires high performance and quality to ensure the safety of our food production. If recycled plastic is of poor quality, it can't be reused in most applications and it runs the risk of being incinerated or landfilled.

This is where BASF plastic additives can help. With IrgaCycle®, customers reduce plastic waste, contribute to a circular economy, and reduce carbon dioxide emissions. Even using 30% recycled content can reduce the carbon footprint of these plastics by 20% or more.



Tailored for recycling, IrgaCycle® solutions improve the quality and concentration of recycled plastics in many applications, including those for agriculture. IrgaCycle® additives improve processing, prevent degradation, enhance mechanical properties, and minimize yellowing of recycled plastics.

## Digital Farming Solutions

Xarvio® Digital Farming Solutions provides businesses with tools to better understand their crop health and disease risk so that they can optimize their crop protection. This allows farmers to easily manage and track their sustainability program throughout the season to lower the carbon intensity of agricultural operations. Xarvio® also increases yield and improves input efficiency substantially, benefiting both farmers and the planet.



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[Recycling Solutions](#)



[Recycling](#)



[Mechanicalrecycling.com](#)



## ENERGY AND RESOURCES



As one of the leading companies in the field of gas treatment worldwide, BASF is the preferred partner for complex new gas plants. Our proven gas treatment technologies provide customized, technologically superior gas treatment technologies for many application fields.

### OASE® and Sustainability

BASF's gas treatment portfolio OASE® plays a crucial role in promoting sustainability throughout our customers' value chain. Compared to conventional technologies, OASE® stands out for its exceptional efficiency, resulting in significant energy savings and emission reductions. Thus, we are offering our customers the opportunity to better reach their sustainability targets.

OASE® includes technologies for the treatment of natural gas, synthesis gas, refinery waste gas, flue gas and biogas. Worldwide, these solutions have been proven and demonstrated in more than 500 reference plants.

We developed innovative technologies and solvents that can be used to remove carbon dioxide (CO<sub>2</sub>) in a particularly efficient way. These technologies also contribute to BASF's NetZero program.

[READ MORE: GAS TREATMENT](#)



# INDUSTRIAL SOLUTIONS



**We offer a broad portfolio of solutions that are used across the printing and packaging and industrial coatings industries, including onto wood and metal substrates. We strive to save resources during the manufacturing process, reduce waste, contribute to packaging circularity, make products more durable and longer lasting.**

## Bio-renewal Content Joncryl® emulsions

>50%

Joncryl® BRC 662 is a water-based colloidal emulsion for inks and coatings with >50% renewable raw material content, bringing sustainability to corrugated board and kraft paper inks without sacrificing performance. It is suitable as a modifier to add renewability to inks designed for labels, folding cartons, and point-of-purchase displays.

### Performance

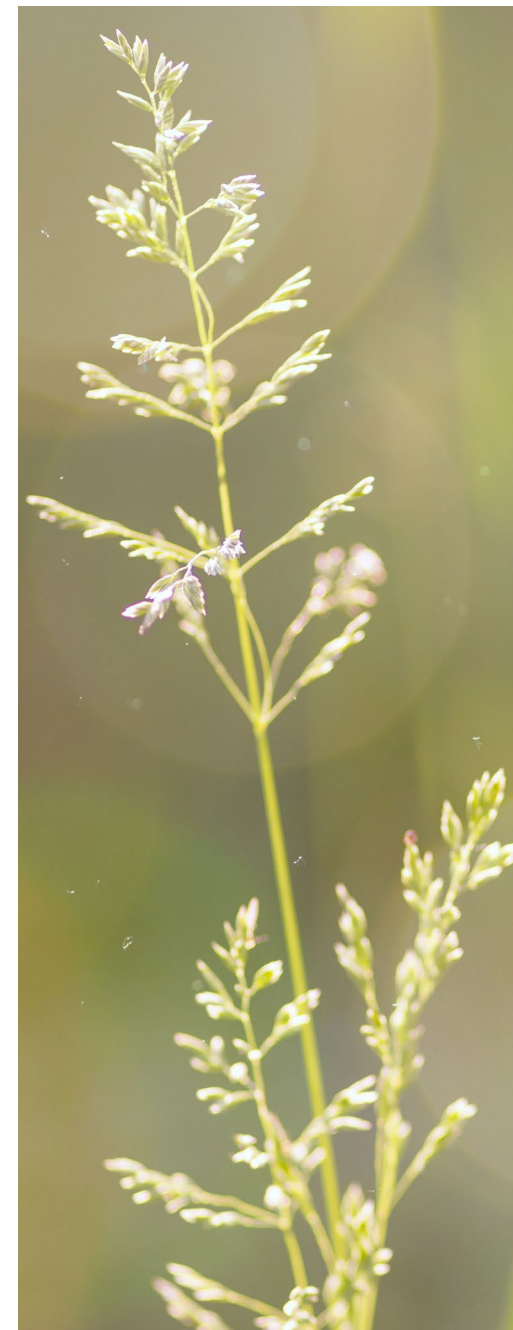
- Excellent transfer and color strength with outstanding resolubility on press.**
- Hard enough to withstand the hot scuffing encountered at the corrugator.**
- Compatibility in combination with Joncryl® emulsions and pigment concentrates.**

>70%

Joncryl® HPD BRC 596 is a water-based high-performance pigment grinding resin with >70% renewable raw material content. It is compatible with other Joncryl® BRC emulsions and defoamers with renewable raw material content, like Foamaster® NO 2331.

### Performance

- Good bleach and shock resistance.**
- Great color strength and gloss.**
- Compatibility with different pigments, Joncryl® BRC emulsions and defoamers with renewable raw materials.**







## CONSTRUCTION



We offer products and solutions to enable energy-efficient housing, such as high-performance insulation materials.

### Lupranate® ZERO

Lupranate® ZERO (Zero Emission, Renewable Origin) expands our portfolio of methylene diphenyl diisocyanate (MDI) and represents the **first greenhouse gas-neutral aromatic isocyanate**. It has an accounting cradle-to-gate product carbon footprint of zero. Zero emissions up to the factory gate are achieved without offset certificates. Instead, renewable raw materials are used at the beginning of the chemical production chain and allocated via a mass balance process.



In addition, fully certified renewable energies are used for the manufacturing process.

Lupranate® ZERO is used to produce MDI polyisocyanurate boards and rigid polyurethane foam for the thermal insulation of buildings. Our customers can now support the replacement of fossil feedstocks with biogenic feedstocks in this type of building insulation via a mass balance process.

### Acronal® Biomass Balanced

Acronal® BMB water-based acrylic and styrene-acrylic emulsion polymers offer high performance and sustainable solutions for formulations used in architectural coatings. Acronal® BMB polymers are identical to their Acronal® counterparts, but achieve a significantly **lower carbon footprint**, because they use **renewable raw materials instead of fossil raw materials via a mass balance approach**.

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