

BASF Green Bond Impact Report 2021

Sustainability is embedded in BASF's corporate purpose: "We create chemistry for a sustainable future." In this context, BASF has decided not only to integrate sustainability into its business, but also to firmly integrate it into its financing activities.

On May 28, 2020, BASF issued its inaugural green bond with a volume of €1.0 billion ("2020 Green Bond") as the first European chemical company. This bond underpins BASF's commitment to use innovative approaches to support a sustainable economy. With this, investors have the opportunity to participate in the financing of BASF's green projects and products that are in line with the company's Green Finance Framework ("GFF"). BASF's GFF has been set up in line with the ICMA Green Bond Principles as well as the LMA Green Loan Principles and received a Second Party Opinion from ISS ESG.

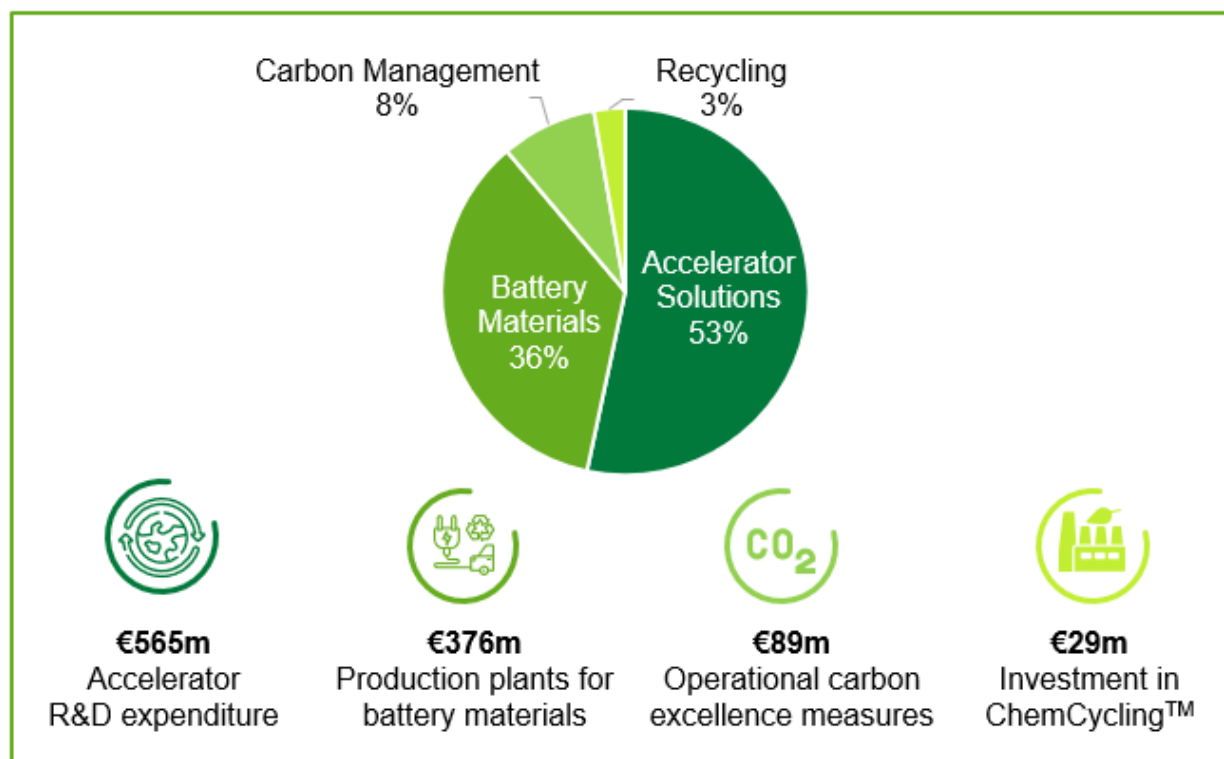
2020 Green Bond and eligible project categories at a glance

Issuance	June 05, 2020		Accelerator Solutions
Maturity	June 05, 2027		Carbon Management
Volume	€1,000 million		Electric vehicle battery materials and plants
Coupon	0.25%		Recycling: ChemCycling products and plants
ISIN	DE000A289DC9		Renewable energy production and storage

BASF's commitment to climate action goes beyond this first green bond and this report. BASF pledged its commitment to sustainability in 1994 and since then has systematically aligned its activities with the principles of sustainability. BASF has taken a holistic approach that covers the entire value chain and has set itself challenging targets to further strengthen its position as a thought leader in sustainability.





This document reports, alongside the Allocation Report 2021, on the impact of the green bond's net proceeds that have been invested within 19 months of the issuance.





Allocation as of year-end 2021



By the end of 2021, BASF had assigned €1,059 million to eligible green projects. In other words, the net proceeds of BASF's 2020 Green Bond have been fully allocated. Further details on the project categories and corresponding allocation can be found in the Allocation Report 2021.

Impact Report 2021

Eligible Project Categories	Accelerator Solutions		Carbon Management	
Target	Sales of Accelerator Products by 2025	€22bn	Reduction of absolute CO ₂ emissions (Scope 1 and 2) by 2030 (vs. 2018)	25%
Target achievement	Accelerator sales Growth vs. 2020	€24bn 44%	Reduction vs. 2018 Reduction vs. 2020	8% 3%
Sustainable impact	Share of R&D spending towards climate / energy beneficial products <u>Sustainability benefit</u> ¹ Resource Efficiency Climate Change & Energy Health & Safety Biodiversity & Renewables Emission Reduction Hunger & Poverty Water	>60% 72% 68% 52% 49% 45% 52% 34%	Reduction of Scope 1 and 2 emissions vs. 1990 Realized operational carbon excellence measures Reduced CO ₂ emissions through carbon excellence measures	50% ~400 127kt/y
UN Sustainable Development Goals				

Eligible Project Categories	Electric vehicle battery materials and plants		Recycling: ChemCycling™ products and plants	
Target	Sales of battery materials by 2023 by 2030 Market share by 2030 ²	>€1.5bn >€7.0bn >10%	Usage of recycled raw materials from 2025 onward Circular sales by 2030	250kt/y €17bn
Target achievement	Under construction	n/a	In process	n/a
Sustainable impact	Number of full electric vehicles per year that could be equipped by European battery materials European CAM related CO ₂ footprint vs. benchmark players by 2022	~400,000 <28%	Number of certified Cycled™ products CO ₂ emissions vs. incineration of mixed plastic waste	50 <50%
UN Sustainable Development Goals				

¹ Accelerator R&D spending contributing to respective sustainability category; including double nominations

² within the global NCM and NCA market



Accelerator Solutions

BASF takes advantage of business opportunities by offering its customers innovative solutions that support their sustainability goals. BASF ensures that the business units follow standard processes to evaluate and consider relevant sustainability criteria when they develop and implement strategies, research projects and innovation processes.

Accelerator products and solutions make a substantial sustainability contribution in the value chain. These include catalysts that reduce emissions to the environment, biodegradable mulch films for agricultural applications, and high-performance insulation materials for higher energy savings and reduced material use in building construction.

A significant steering tool for the product portfolio, based on the sustainability performance of BASF's products, is the Sustainable Solution Steering method. It considers BASF's products' applications in various markets and customer industries. Transparently classifying its products on the basis of their contribution to sustainability enables BASF to systematically improve them. BASF reviews the categorization of the portfolio at least every four years. This includes analyzing the portfolio in workshops.

BASF strives to offer products that make a greater contribution to sustainability in their area of application to live up to its own commitments and meet its customers' demands. That is why an adapted version of BASF's Sustainable Solution Steering method is used in areas such as its research and development pipeline, and in merger and acquisition projects. The results and any measures required are part of BASF's business strategies.

By the end of the 2021 business year, BASF had evaluated 98.7% of the relevant portfolio (2020: 98.4%). This refers to the BASF Group's sales from products in its strategic portfolio to third parties in the business year concerned. By the end of 2021, sustainability analyses and assessments had been conducted for more than 56,000 specific product applications (2020: >57,000), accounting for €71 billion in sales (2020: €54.1 billion).

In 2021, BASF generated sales of €24.1 billion with Accelerator products (2020: €16.7 billion) – already reaching its target for 2025. BASF will update its product portfolio steering target over the course of 2022. Accelerator products account for 33.9% of the assessed relevant portfolio. Sales of Accelerator products rose by 44.3% compared with the previous year. This is primarily attributable to the positive development of Accelerator sales in the Surface Technologies and Chemicals segments.





New market requirements arise as a result of the continuous development of new product solutions in the industry or changing regulatory frameworks. This influences the comparative assessment, which is why BASF regularly reassesses its product portfolio.

BASF's "Accelerator Solutions" are partly covered by the current EU Taxonomy and contribute to the EU environmental target of "climate change mitigation."

Accelerator examples

Trilon® M types / Trilon® Ultimate types

Process information

Application:	Home Care, focus dishwashing
Customer industry:	Home Care
Market:	Global



Sustainability performance

- Readily biodegradable strong chelating agent
- Meets EU eco-label requirements
- Good eco-tox profile compared to other strong chelating agents
- Eco-efficiency analysis available
- Phosphate alternative in automatic dish wash (ADW)
- Bio-grades available: Trilon® M Max BioBased with a measurable bio-content of up to 43%, Trilon® M Max EcoBalanced, 100% bio-certified

ecovio® F2330 (biodegradable bag)

Process information

Application:	Plastic bags
Customer industry:	Consumer
Market:	Global



Sustainability performance

- Biodegradability
- Partly bio-based, renewable resources
- Compostable
- Waste reduction



Acronal® 3795

Process information

Application:	Pressure-sensitive adhesives for temporary self-adhesive protective films
Customer industry:	Protective films
Market:	Europe

Sustainability performance

- Water-based solution
- Alkylphenol ethoxylates-free
- Formaldehyde-free



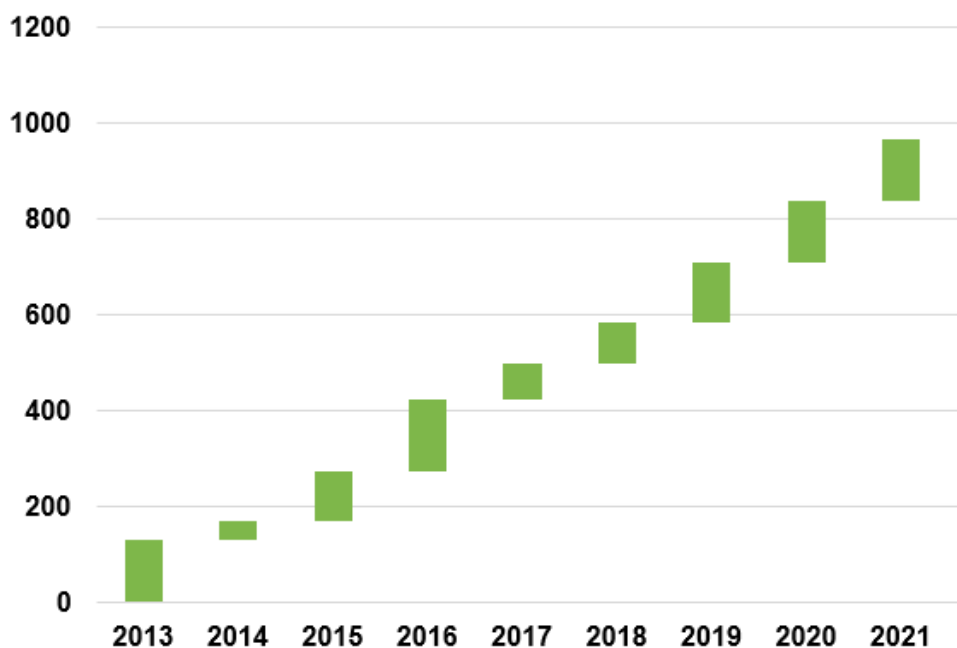


Carbon Management

As an energy-intensive company, BASF takes responsibility for the efficient use of energy and global climate protection. BASF is committed to the Paris Climate Agreement. By 2025, BASF plans to invest up to €1 billion to achieve its climate protection targets. Additional investments of up to €3 billion are to follow by 2030. BASF has bundled its global activities to reduce greenhouse gas emissions in its carbon management. This has five levers to reduce greenhouse gas emissions: Using renewable energies for both electricity and steam production, developing and applying new carbon-free and low-carbon production processes, using alternative raw materials, and ongoing measures to further increase energy and resource efficiency in our production. The latter have the greatest impact at our Verbund sites. Some projects are on a relatively small scale, but the cumulative impact is impressive: Between 2013 and 2021 such measures reduced the CO₂ emissions of BASF Group by around 1 million metric tons.

Reduction of CO₂ emissions through operational excellence measures

Kilo tons per year, cumulative



In 2021, ~400 operational excellence measures that reduced CO₂ emissions were realized. For instance, in a plant for plastics production waste heat was used to generate steam for other plants, which is equivalent to ~5,000 tons lower CO₂ emissions annually. Another example is further optimized process control in the nitric acid cluster, which avoids 145,000 tons of CO₂ equivalents per year.



As part of its carbon management, BASF aims to make its plants and processes even more efficient and resource saving. An important component of this is the introduction and ongoing maintenance of certified energy management systems according to DIN EN ISO 50001 at all relevant production sites. These help BASF to identify and implement further potential for improvement in energy efficiency. This not only reduces greenhouse gas emissions and saves valuable energy resources but also increases BASF's competitiveness. In 2021, 76 production sites worldwide had certified energy management systems, representing 90% of BASF's primary energy demand. A global working group provides ongoing support to the sites and Group companies in implementing and maintaining certified energy management systems. All energy efficiency measures are recorded in a global database, analyzed and made available to BASF sites as best practices.

BASF's activities under its carbon management program do not fall within the current reporting scope of the EU Taxonomy but nevertheless contribute to the EU environmental target of "climate change mitigation."



Electric vehicle battery materials and plants

The transportation sector is one of the largest sources of greenhouse gases. In Europe, for example, around one-quarter of all CO₂ emissions are caused by road traffic. As a leading supplier of battery materials for lithium-ion batteries, BASF is paving the way for the age of electromobility. Here, too, the focus is on sustainability – from the responsible procurement of mineral raw materials and the most economical use in production to recycling at the end of the life cycle. In the future, the carbon footprint of BASF's European production will be significantly below the industry standard thanks to BASF's efficient manufacturing processes, the high share of renewable energy, and regional procurement and recycling of key raw materials.

“We strongly believe that electromobility should be based on batteries that are produced with the highest possible social and environmental standards. BASF is contributing with lowest-CO₂ cathode active material solutions to relentlessly strive for a unique, reliable and sustainable battery value chain. We practice sustainable raw materials sourcing and leverage recycling solutions without compromising performance and cost competitiveness.”

Dr. Michael Baier, Senior Vice President of Battery Materials, Catalysts Division at BASF



BASF is expanding its battery materials business with further investments and strategic partnerships and is developing innovative recycling concepts, in particular to supply the fast-growing global e-mobility market with sustainable solutions. BASF is currently building a precursor plant for cathode active materials in Harjavalta, Finland, and a production plant for cathode active materials in Schwarzheide, Germany. Both plants are scheduled



Visualisation of the future plant for cathode active materials in Schwarzheide, Germany.

for startup around the end of 2022 with an initial capacity enabling the supply of around 400,000 full electric vehicles per year with BASF battery materials. In Schwarzheide, BASF is also building a prototype plant for battery recycling, which is expected to start up in 2023, as well as a commercial scale battery recycling black mass plant, which is expected to start up in 2024. BASF also reached another important milestone in the development of a global value chain for battery materials with the formation of BASF Shanshan Battery Materials Co., Ltd. in China at the end of August 2021.



With production facilities in all key regions, BASF is able to serve cell manufacturers and OEM customers in all relevant markets with tailored and sustainable solutions. BASF also entered into a number of cooperative agreements in 2021, including with battery cell manufacturers such as CATL and SVOLT and automotive manufacturers such as Porsche. The aim is to jointly drive forward the development of innovative cathode active materials and recycling technologies.

The production of precursor cathode active materials and cathode active materials involves various mineral raw materials such as cobalt, lithium, nickel, aluminum, and manganese. Sourcing mineral raw materials responsibly is the expectation and a guiding principle of BASF. When sourcing minerals, companies may face challenges in the areas of environment, health and safety, and human rights, e.g., if cobalt is extracted through artisanal mining in the Democratic Republic of Congo (DRC).

BASF is committed to fostering a responsible and sustainable global supply chain of raw materials, including cobalt. To effectively respond to risks related to sourcing of minerals, BASF has adopted a specific due diligence approach that complements its general corporate sustainability in procurement management system. Understanding the challenges and risks for the industry, we aim to achieve more meaningful impacts in terms of the UN Sustainable Development Goals. BASF participates in multi-stakeholder and industry initiatives that promote the development of a responsible Artisanal and Small-scale Mining (ASM) standard and reinforce our own efforts through collaborative approaches such as Global Battery Alliance.

BASF's activities in relation to battery materials are partly covered by the current EU Taxonomy and contribute to the EU environmental target of "climate change mitigation."



Recycling: ChemCycling™ products and plants

Each year, almost 20 million metric tons of plastic waste in Europe go unrecycled. By establishing chemical recycling as a complementary solution to mechanical recycling it is possible to bring back more plastic waste into the materials cycle, which would otherwise be incinerated. Chemical recycling can be used to process plastic waste streams that are not recycled mechanically for technological, economic or ecological reasons. For example, while sorted single-stream plastic waste should be recycled mechanically, chemical recycling can be used for mixed post-consumer plastic waste streams for which further sorting is not economical. In its ChemCycling™ project, BASF's technology partners convert waste such as used tires or mixed plastic waste, which was not previously recycled, into pyrolysis oil. BASF can feed this pyrolysis oil into its Verbund structure in place of fossil raw materials and use it to make new products based on a certified mass balance approach. This reduces waste, saves resources and simultaneously reduces the carbon footprint of its products. The products have the same properties as those manufactured from fossil feedstock and customers can therefore further process them in the same way as conventionally manufactured products and use them in demanding applications.

The ChemCycling™ project was launched by BASF in 2018. In the pilot phase, BASF presented first prototypes with customers. These included mozzarella cheese packaging, transparent refrigerator components and insulation boxes for sensitive applications. Since 2020, first commercial products were launched by customers, including pharma boxes, transport packaging and food packaging. The portfolio now comprises around 50 products. One example is Styropor® Ccycled™, which is used to manufacture products like insulated transport boxes for temperature-sensitive goods such as coronavirus vaccines. Compared with conventional Styropor®, at least 50 percent of CO₂ is saved in the production of Styropor® Ccycled™. Another application is functional textiles. For example, VAUDE has launched outdoor pants made using our Ultramid® Ccycled™ polyamide in 2022, with potential for further recycled equipment, e.g., backpacks.



BASF has established partnerships with Quantafuel, Arcus, Pyrum and New Energy. Quantafuel and Arcus are specialized in pyrolysis of mixed plastic waste, Pyrum and New Energy are specialized in the pyrolysis of end-of-life tires. With these partnerships, BASF has taken a significant step towards establishing a broad supply base for pyrolysis oil and towards offering customers products based on chemically recycled plastic waste on a commercial scale.

The activities under BASF's ChemCycling™ project are not covered by the EU Taxonomy yet but contribute to the EU environmental objective of "transition to a circular economy, waste prevention and recycling."

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