



Management's Report

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To Our Shareholders

Management's Report

Corporate Governance

Consolidated Financial Statements

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Overview

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The Management's Report comprises the chapter of the same name on pages 16 to 167, as well as the disclosures required by takeover law and the Declaration of Corporate Governance. These are presented in the Corporate Governance chapter. The Nonfinancial Statement (NFS) is integrated into the Management's Report.

NFS in accordance with sections 315b and 315c of the German Commercial Code (HGB)

The NFS disclosures can be found in the relevant sections of the Management's Report and have been prepared in accordance with the appropriate frameworks: the Global Reporting Initiative Standards and the reporting requirements of the U.N. Global Compact. The table on the following page shows the sections and subsections in which the individual disclosures can be found. In addition to a description of the business model, the NFS includes disclosures on the following matters, to the extent that they are required to understand the development and performance of the business, the Group's position and the impact of business development on the following matters: environmental matters, employee-related matters, social matters, respect for human rights, anti-corruption and bribery matters.

In accordance with the E.U. Taxonomy Regulation and the supplementary delegated acts, the NFS includes the proportion of the Group's taxonomy-eligible and, for the first time, our Group-wide taxonomy-aligned turnover, capital expenditures (including acquisitions and excluding goodwill in accordance with the E.U. taxonomy) and operating expenditures for the 2022 business year. This applies to the environmental objectives of climate change mitigation and adaptation to climate change currently addressed in the E.U. taxonomy.

Within the scope of the annual audit, KPMG checked pursuant to section 317(2) sentence 4 HGB that the NFS was presented in accordance with the statutory requirements. KPMG also conducted a limited assurance of the NFS. An assurance statement of the limited assurance can be found online at basf.com/nfs-audit-2022. The assurance was conducted in accordance with ISAE 3000 (Assurance Engagements other than Audits or Reviews of Historical Financial Information) and ISAE 3410 (Assurance Engagements on Greenhouse Gas Statements), the relevant international assurance standards for sustainability reporting.

Disclosures required by takeover law in accordance with section 315a HGB

The disclosures required by takeover law in accordance with section 315a of the German Commercial Code (HGB) can be found in the Corporate Governance chapter starting on page 168. They form part of the Management's Report, which is audited as part of the annual audit.

Compensation Report

The Compensation Report in accordance with section 162 of the German Stock Corporation Act (AktG) is publicly available on the BASF website together with the assurance statement of the substantive and formal audit issued by the auditor.

 The Compensation Report is available online at basf.com/compensationreport

Declaration of Corporate Governance in accordance with section 315d HGB in connection with section 289f HGB

The Consolidated Declaration of Corporate Governance in accordance with section 315d HGB in connection with section 289f HGB can be found in the Corporate Governance chapter from page 194 onward and is a component of the Management's Report. It

comprises the Corporate Governance Report, including the description of the diversity concept for the composition of the Board of Executive Directors and the Supervisory Board (excluding the disclosures required by takeover law in accordance with section 315a HGB), compliance reporting and the Declaration of Conformity pursuant to section 161 of the German Stock Corporation Act. Pursuant to section 317(2) sentence 6 HGB, the auditor checked that the disclosures according to section 315d HGB were made.

Recommendations of the Task Force on Climate-related Financial Disclosures

BASF supports the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). Disclosures recommended by the TCFD are presented in a number of places throughout this report. The table on page 19 shows the sections and subsections in which the relevant information can be found. The table is divided into four key areas in line with the TCFD recommendations: governance, strategy, risk management, and metrics and targets.

Symbols, captions and QR codes

 You can find more information in this report.

 You can find more information online. The content of these links are voluntary disclosures that were not audited by the auditor.

 The content of this section is not part of the statutory audit but has undergone a separate limited assurance by our auditor.

 The content of this section is voluntary, unaudited information, which was critically read by the auditor.

Captions, links and the information contained on linked websites, and QR codes are not part of the audit.

Nonfinancial Statement (NFS) disclosures in the relevant chapters of the integrated report

NFS disclosure	Topics	Concepts and results
Business model	BASF Group	Pages 20–23
E.U. Taxonomy	E.U. Taxonomy	Pages 95–99
Environmental matters	Process safety Biodiversity Energy and Climate Protection Emergency response and corporate security Supplier management Emissions to air Product stewardship Resource efficiency Steering of product portfolio Transportation and storage Management of waste and contaminated sites Water	Page 36 (targets) / pages 123–124 and 125–127 (targets, measures, results) Pages 147–150 (targets, measures, results) Page 36 (targets) / pages 27 and 135–141 (targets, measures, results) Pages 128–129 (targets, measures, results) Page 36 (targets) / pages 114–116 (targets, measures, results) Pages 123–124 and 142–143 (targets, measures, results) Pages 123–124 and 132–133 (targets, measures, results) Pages 43–44 and 142–143 (targets, measures, results) Page 45 (targets, measures, results) Pages 123–124 and 134 (targets, measures, results) Pages 123–124 and 142–143 (targets, measures, results) Page 36 (targets) / pages 123–124 and 144–146 (targets, measures, results)
Employee-related matters	Occupational safety Dialog with employee representatives Inclusion of diversity What we expect from our leaders Health protection International labor and social standards Learning and development Supplier management Employee engagement Competition for talent Compensation and benefits	Page 36 (targets) / pages 123–124 and 125–126 (targets, measures, results) Page 106 (targets, measures, results) Page 36 (targets) / pages 107–108 (targets, measures, results) Pages 102–103 (targets, measures, results) Pages 123–124 and 127 (targets, measures, results) Page 110 (targets, measures, results) Pages 103–104 (targets, measures, results) Page 36 (targets) / pages 114–116 (targets, measures, results) Page 36 (targets) / page 102 (targets, measures, results) Page 103 (targets, measures, results) Page 105 (targets, measures, results)
Social matters	Societal engagement	Pages 48 and 112 (targets, measures, results)
Respect for human rights	International labor and social standards Supplier management Responsibility for human rights	Page 110 (targets, measures, results) Page 36 (targets) / pages 114–116 (targets, measures, results) Pages 109–111 (targets, measures, results)
Anti-corruption and bribery matters	Compliance Supplier management	Pages 179–181 (targets, measures, results) Page 36 (targets) / pages 114–116 (targets, measures, results)

Recommendations of the Task Force on Climate-related Financial Disclosures in the relevant chapters of the integrated report

Topic	Recommended disclosures	Section/explanation	Page
Governance	Describe the board's ^a oversight of climate-related risks and opportunities.	Corporate Governance Report – Direction and management by the Board of Executive Directors Report of the Supervisory Board Our Sustainability Concept – Our organizational and management structures	Pages 169–170 Pages 186–192 Page 47
Disclose the organization's governance around climate-related risks and opportunities.	Describe management's ^b and senior executives' role in assessing and managing climate-related risks and opportunities.	Our Sustainability Concept – Our organizational and management structures	Page 47
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium and long term. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy and financial planning. Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	Opportunities and Risks – Operational opportunities and risks Opportunities and Risks – Financial opportunities and risks Opportunities and Risks – Strategic opportunities and risks Energy and Climate Protection – Strategy and governance Material topics in focus: Climate Change Our Sustainability Concept – Our organizational and management structures Our Strategic Action Areas – Sustainability Opportunities and Risks – Operational opportunities and risks Opportunities and Risks – Financial opportunities and risks Opportunities and Risks – Strategic opportunities and risks Opportunities and Risks – Tools Opportunities and Risks – Strategic opportunities and risks	Pages 160–163 Pages 163–164 Pages 164–167 Pages 135–136 Page 27 Page 47 Page 29 Pages 160–163 Pages 163–164 Pages 164–167 Pages 159–160 Pages 164–167
Risk management	Describe the organization's processes for identifying and assessing climate-related risks. Describe the organization's processes for managing climate-related risks. Describe how processes for identifying, assessing and managing climate-related risks are integrated into the organization's overall risk management.	Opportunities and Risks – Risk management process Opportunities and Risks – Tools Opportunities and Risks – Risk management process Opportunities and Risks – Strategic opportunities and risks Opportunities and Risks – Tools	Pages 158–159 Pages 159–160 Pages 158–159 Pages 164–167 Pages 159–160
Metrics and targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process. Disclose Scope 1, Scope 2, and Scope 3 greenhouse gas (GHG) emissions, and the related risks. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	Energy and Climate Protection – Global targets Energy and Climate Protection – Energy supply Energy and Climate Protection – Corporate carbon footprint Energy and Climate Protection – Global targets Energy and Climate Protection – Strategy and governance Energy and Climate Protection – Energy supply	Page 136 Pages 137–138 Pages 139–140 Page 136 Pages 135–136 Pages 137–138

^a Refers to the Supervisory Board

^b Refers to the Board of Executive Directors

BASF Group

GRI 2

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility.
Around 111,500 employees contribute to the BASF Group's success worldwide. Our business is divided into the Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions segments.

Sites and Verbund

As one of the world's largest chemical companies, BASF is present in 91 countries. We operate 239 production sites worldwide. The foundation for the Verbund concept was laid in 1865 at the Ludwigshafen site in Germany and is still one of BASF's great strengths today. Intelligently linking and steering our Verbund plants creates efficient value chains – from basic chemicals to high value-added solutions such as coatings or crop protection products. The Verbund enables us to manage our production in a resource-efficient, carbon-optimized and reliable way. By-products from one facility are used as feedstocks elsewhere, for example. This saves us raw materials and energy, avoids emissions, lowers logistics costs and leverages synergies.

In addition to Ludwigshafen, BASF operates five other Verbund sites in Antwerp, Belgium; Freeport, Texas; Geismar, Louisiana; Kuantan, Malaysia; and Nanjing, China. Another Verbund site is being built in Zhanjiang in the southern Chinese province of Guangdong.

We also use the Verbund principle for more than production, applying it to technologies, the market and digitalization as well. Research expertise is bundled globally.

For more information on the Verbund concept, see bASF.com/en/verbund

For more information on our segments' investments, see page 37 onward

The BASF Group's segments in 2022



Chemicals

The Chemicals segment supplies BASF's other segments and customers with basic chemicals and intermediates.

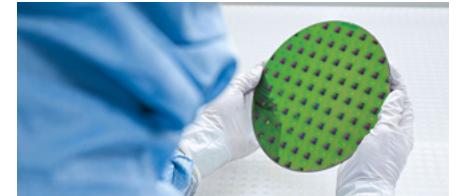
- Share of sales: 17%
- R&D expenses: €93 million
- Investments including acquisitions:¹ €1,701 million



Materials

The Materials segment offers advanced materials and their precursors for the plastics and plastics processing industries.

- Share of sales: 21%
- R&D expenses: €201 million
- Investments including acquisitions:¹ €880 million



Industrial Solutions

The Industrial Solutions segment develops and markets ingredients and additives for industrial applications.

- Share of sales: 12%
- R&D expenses: €172 million
- Investments including acquisitions:¹ €322 million



Surface Technologies

The Surface Technologies segment offers chemical solutions for surfaces and automotive coatings, as well as battery materials and catalysts.

- Share of sales: 24%
- R&D expenses: €335 million
- Investments including acquisitions:¹ €740 million



Nutrition & Care

The Nutrition & Care segment produces ingredients and solutions for consumer applications such as human and animal nutrition, and home and personal care.

- Share of sales: 9%
- R&D expenses: €172 million
- Investments including acquisitions:¹ €642 million



Agricultural Solutions

The Agricultural Solutions segment is an integrated provider of seeds, crop protection and digital solutions for the agricultural sector.

- Share of sales: 12%
- R&D expenses: €944 million
- Investments including acquisitions:¹ €414 million

¹ Additions to property, plant and equipment and intangible assets

Organization of the BASF Group

The BASF Group consists of eleven operating divisions, which are grouped into six segments as follows:

- **Chemicals:** Petrochemicals, Intermediates
- **Materials:** Performance Materials, Monomers
- **Industrial Solutions:** Dispersions & Resins, Performance Chemicals
- **Surface Technologies:** Catalysts, Coatings
- **Nutrition & Care:** Care Chemicals, Nutrition & Health
- **Agricultural Solutions:** Agricultural Solutions

This segment structure enables us to steer our businesses in a differentiated way according to market-specific requirements and the competitive environment. We provide a high level of transparency around the results of our segments and show the importance of the Verbund and value chains to our business success. The operating divisions, the service units, the regions and the corporate center are the cornerstones of the BASF organization. This organizational structure lays the foundation for customer proximity, competitiveness and profitable growth. BASF aims to differentiate its businesses from their competitors and establish a high-performance organization to enable BASF to be successful in an increasingly competitive market environment.

 For more information on the products and services offered by the segments, see pages [72](#), [76](#), [79](#), [82](#), [85](#) and [88](#) onward

For more information on the segment structure, see Note 5 to the Consolidated Financial Statements from page [219](#) onward

The divisions bear strategic and operational responsibility and are organized according to sectors or products. They manage the 52 global and regional business units and develop strategies for 72 strategic business units.

BASF's regional and national companies represent the Group locally and support the growth of business units with local proximity to customers. For financial reporting purposes, we organize the regional companies into four regions: Europe, North America, Asia Pacific, as well as South America, Africa and Middle East.

To strengthen our innovation capabilities, we reorganized our global research activities in 2022 and aligned them even more closely with the needs of our customers. As part of this, we integrated downstream research into the divisions and bundled activities with broad relevance for our customers in a research division. This division is globally positioned with research centers in Europe, North America and Asia Pacific.

 For more information on the reorganization of our research activities, see page [49](#) onward

Five service units provide competitive services for the operating divisions and sites: Global Engineering Services, Global Digital Services, Global Procurement, European Site & Verbund Management and Global Business Services (finance, human resources, environmental protection, health, safety and quality, intellectual property, communications, procurement, supply chain and in-house consulting services).

We have driven forward the bundling of services and resources in the Global Business Services unit, making greater use of the digitalization of processes. This aims to achieve annual savings of more than €200 million from 2023.¹

The Corporate Center supports the Board of Executive Directors in steering the company as a whole. These include central tasks from the following areas: strategy, finance and controlling, compliance and law, tax, environmental protection, health, safety and quality, human resources, communications, investor relations, corporate audit and the Net Zero Accelerator unit.

Procurement and sales markets

BASF supplies products and services to around 82,000 customers² from various sectors in almost every country in the world. Our customer portfolio ranges from major global customers and small and medium-sized enterprises to end consumers.

We work with over 70,000 Tier 1 suppliers³ worldwide. They supply us with important raw materials, chemicals, investment goods and consumables, and perform a range of services.

 For more information on customers, see page [26](#); for more on suppliers, see page [114](#) onward; for more on raw materials, see page [117](#) onward

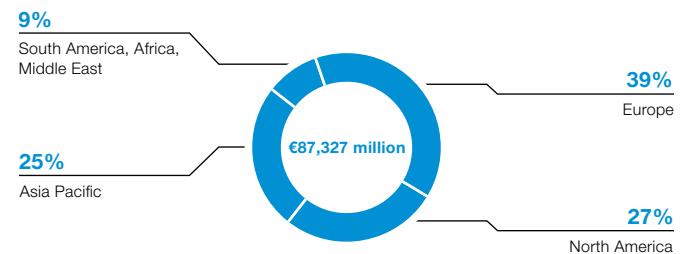
BASF sales by industry 2022

Direct customers

>20%	Chemicals and plastics Transportation (respectively)
10%–20%	Agriculture Consumer goods (respectively)
<10%	Construction Electronics Energy and resources Health and nutrition (respectively)

BASF sales by region 2022

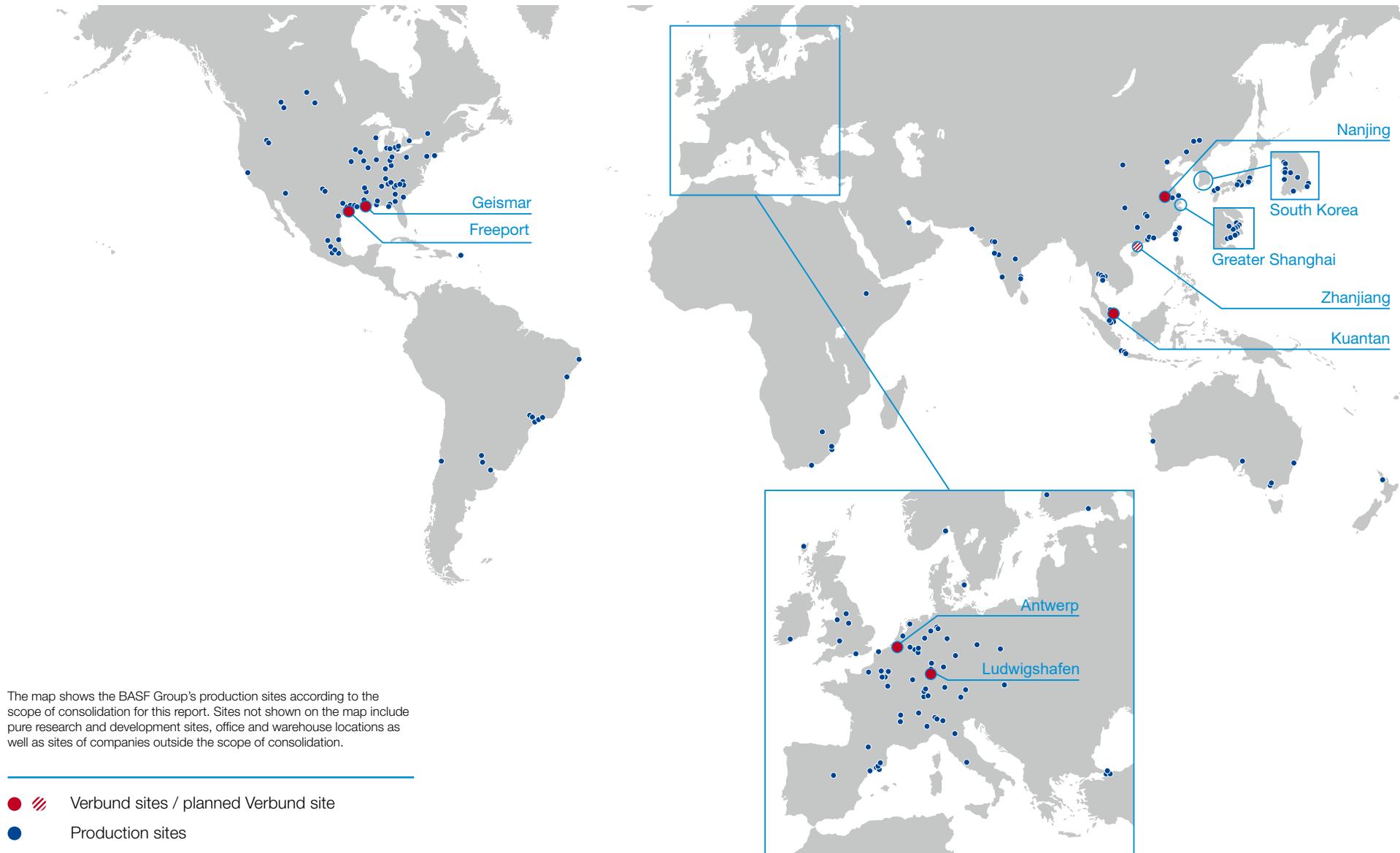
Location of customer



¹ Part of these savings is included in the €500 million cost savings program announced in October 2022.

² The number of customers refers to all external companies (sold-to parties) that had contracts with the BASF Group in the business year concerned in which sales were generated.

³ BASF considers all direct suppliers of the BASF Group in the business year concerned as Tier 1 suppliers. These are suppliers that provide us with raw materials, investment goods, consumables and services. Suppliers can be natural persons, companies or legal persons under public law.

BASF's production sites

Business and competitive environment

BASF's global presence means that it operates in the context of local, regional and global developments and a wide range of conditions. These include:

- Global economic and political environment
- Legal and political requirements
- International trade agreements
- Industry standards
- Environmental agreements (such as the E.U. Emissions Trading System)
- Social aspects (such as the U.N. Universal Declaration of Human Rights)

 BASF holds one of the top three market positions in around 80% of the business areas in which it is active. Our most important global competitors include Arkema, Bayer, Clariant, Corteva, Covestro, Dow, Dupont, DSM, Evonik, Huntsman, Lanxess, SABIC, Sinopec, Solvay, Sumitomo Chemical, Syngenta, Wanhua and many hundreds of local and regional competitors. We expect competitors from Asia and the Middle East in particular to continue to grow in significance in the years ahead.

Challenging market conditions in Europe

On February 24, 2022, Russia launched a war against Ukraine. BASF strongly condemns the Russian attack on Ukraine. As a consequence, the company announced on April 27, 2022, that it would wind down its existing business activities in Russia in accordance with international law. Exempt from this decision is business to support food production, as the war risks triggering a global food crisis. The decision to withdraw from Russia led to special charges in EBIT of €72 million, including impairments on property, plant and equipment of €14 million. In 2021, Russia and Belarus accounted for around 1% of the BASF Group's total sales.

The war in Ukraine has significantly changed the economic environment in Europe. Above all, reduced gas supplies from Russia led to much higher and volatile commodity and energy prices and exceptionally high uncertainty, especially surrounding the gas supply. As a result, the European gas price peaked at a monthly average of €235.94 per MWh (\$69.84 per mmBtu) in August 2022. In December 2022, it was significantly lower, averaging €118.25 per MWh (\$36.74 per mmBtu), but still more than five times the U.S. gas price (Henry Hub). European gas prices averaged €124.16 per Mwh (\$38.01 per mmBtu) for the year, more than double the prior-year level and more than ten times the 2020 level. The consequences of the gas price increase are manifold: In addition to strong cost pressure, it is driving inflation, weakening the economy and slowing demand from our customer industries. This development made production adjustments necessary in Europe's energy-intensive industries. BASF took a variety of measures here. For example, ammonia production was temporarily scaled back and partly offset by higher plant utilization at non-European sites and through procurement. BASF also reduced its consumption of natural gas in European production by switching to alternative fuels wherever technically possible and economically viable. Even though European gas prices were already higher than U.S. prices before the outbreak of the war in Ukraine, they are expected to decline again with the targeted substitution and diversification of gas procurement sources and the shift to other energy sources, but to remain well above pre-crisis levels.

Another factor leading to generally challenging conditions for the European chemical industry include planned regulations under the European Green Deal. These will have far-reaching consequences for the regulation of chemicals in Europe. All of these headwinds are weakening the competitiveness of European chemical production.

Against this background and given the significant decline in earnings in our European market, we have announced a cost-cutting program focusing on Europe and above all Germany. Concrete measures are currently being developed. The program will be implemented in 2023 and 2024 and is expected to generate annual savings of €500 million in non-production areas upon completion. In

parallel, we are developing further measures to structurally adjust BASF's Production Verbund in Europe.

 For more information on how BASF is reducing its natural gas consumption, see page 118

Corporate legal structure

As the publicly listed parent company of the BASF Group, BASF SE takes a central position: Directly or indirectly, it holds the shares in the companies belonging to the BASF Group, and is also one of the largest operating companies. In the BASF Group Consolidated Financial Statements, 248 companies including BASF SE are fully consolidated. We consolidate nine joint operations on a proportional basis and account for 23 companies using the equity method.

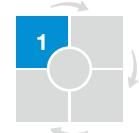
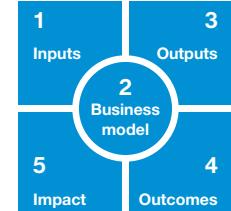
 For more information, see Note 2 to the Consolidated Financial Statements from page 214 onward

How We Create Value

The following overview shows how we create value for our stakeholders. It is modeled on the framework of the former International Integrated Reporting Council (IIRC). The content of the graph has been audited within the scope of the relevant sections of the Management's Report.



Discover the interactive
How We Create Value graphic
in the BASF Online Report at
bASF.com/how-we-create-value



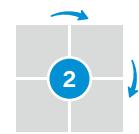
We use a wide range of
resources to implement our
customer-focused strategy

Inputs

Financial	Innovation	Operations	Environment	Employees	Partnerships
Our aim is to ensure solvency at all times, limit financial risks and optimize the cost of capital.	We develop innovative solutions for and with our customers to expand our leading position.	Safety, quality and reliability are key to excellence in our production and plant operations.	We use natural resources to manufacture products and solutions with high value added for our customers.	Everything we do is based on the expertise, knowledge, motivation and conduct of our employees.	Trust-based relationships are crucial to our license to operate and our reputation.
48.4% Equity ratio	~10,000 R&D employees	€4.1 billion Capex	1.2 MMT Renewable raw materials	111,481 Employees around the world	>70,000 Suppliers
>900,000 Shareholders	€2.3 billion R&D expenses	16% Electricity from renewable sources	1,590 million m ³ Total water abstraction	€11.4 billion Personnel expenses	~82,000 Customers

Business model

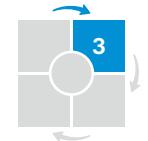
Corporate purpose	Our targets	How we operate
We create chemistry for a sustainable future	<ul style="list-style-type: none"> ■ Profitable growth ■ Effective climate protection ■ Product portfolio geared to innovation and sustainability ■ Responsible procurement ■ Resource-efficient and safe production ■ Employee engagement and diversity 	<ul style="list-style-type: none"> ■ Our customers are at the core of our strategy. We have a global, customer-focused presence and strive to achieve a leading position in our markets and business areas. ■ We build on a broad and diversified investor base. ■ Sustainability and innovation are at the center of everything we do and a driver for growth and value. ■ BASF's Verbund structure is the backbone of our efficient and reliable production. ■ Our segments address customer needs with differentiated solutions and business strategies. ■ Safety is always our number one priority. ■ Effective corporate governance ensures responsible conduct. ■ We value our employees and stakeholders and treat them with respect.



We implement our
corporate purpose

Outputs

 Financial	 Innovation	 Operations	 Environment	 Employees	 Partnerships
€6.9 billion EBIT before special items	~1,000 New patents worldwide	~45,000 Sales products	>1,000 Mass balance products based on alternative raw materials	81% Engagement index according to 2022 employee survey	1,042 Suppliers screened through Together for Sustainability
€3.0 billion Proposed dividend payment to shareholders ¹	~€12 billion Sales of products that have been on the market for up to five years	6.2 MMT CO ₂ avoided through Verbund and combined heat and power generation	79% Water demand recirculated	27.2% Women in leadership positions	~60 Strategic customer networks



We focus on material sustainability topics and evaluate the opportunities and risks of our actions

Outcomes²

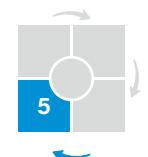
 Economic	 Environmental	 Social
<p>We make positive contributions by</p> <ul style="list-style-type: none"> ■ Driving forward growth, progress and value creation ■ Strengthening our customers' competitiveness and innovative strength ■ Accelerating the digital transformation of the industry ■ Offering our investors an attractive dividend yield <p>Potential negative impacts</p> <ul style="list-style-type: none"> ■ Weaker growth stimulus as a result of the slowing economy, the war in Ukraine, the coronavirus pandemic and global trade conflicts ■ A weaker share performance <p>Our countermeasures</p> <ul style="list-style-type: none"> ■ Disciplined implementation of our corporate strategy ■ Systematic cost management ■ Active portfolio management ■ Optimizing the cost of capital 	<p>We make positive contributions by creating products that</p> <ul style="list-style-type: none"> ■ Contribute to climate protection ■ Conserve resources, avoid waste and strengthen circularity ■ Pave the way for climate-smart mobility ■ Are environmentally friendly and safe to use <p>Negative impacts</p> <ul style="list-style-type: none"> ■ The emission of CO₂ and other gases that affect the climate ■ Resource consumption and non-recyclable waste ■ Potential misuse or spillage of products <p>Our countermeasures</p> <ul style="list-style-type: none"> ■ Carbon management ■ Circular Economy Program ■ Sustainable water and energy management ■ Responsible Care management (including product stewardship) 	<p>We make positive contributions because we</p> <ul style="list-style-type: none"> ■ Offer products that improve people's quality of life ■ Provide attractive jobs and promote diversity ■ Pay taxes and competitive wages and salaries ■ Promote integration and help overcome social challenges <p>Potential negative impacts</p> <ul style="list-style-type: none"> ■ Risk of violation of labor, environmental and social standards in the production of the raw materials we procure ■ Personnel adjustments <p>Our countermeasures</p> <ul style="list-style-type: none"> ■ Careful selection, evaluation and development of suppliers ■ Projects to improve sustainability in the supply chains ■ Compliance Program and Code of Conduct ■ Employee training programs



We aim to increase our positive contributions, minimize negative impacts and carefully assess conflicting goals

Impact

We achieve long-term business success by creating value for our shareholders, our company, the environment and society (see basf.com/en/value-to-society)



¹ Based on the dividend proposed by the Board of Executive Directors and the number of outstanding shares as of December 31, 2022 (893,854,929)

² The outcomes category shows examples of positive contributions as well as negative impacts and the measures we take to mitigate them.

Our Strategy

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Chemistry is our passion. We want to be the most attractive partner for our customers to overcome challenges that can be solved with chemistry. Our customers are at the center of everything we do. With our products and technologies, our innovative and entrepreneurial spirit and the power of our Verbund integration, we want to grow profitably and at the same time, create value for society and the environment. This is our goal, which is embedded in our corporate purpose: We create chemistry for a sustainable future.

Humankind is facing enormous challenges. The climate is changing, natural resources are becoming scarcer, pressure on ecosystems is increasing and our growing world population needs to be fed. More and more urgently than ever, **solutions are needed for a sustainable future**. Chemistry plays a key role here. In almost all areas of life, it can pave the way to greater sustainability with innovative products and technologies and accelerate the change needed to achieve this. This belief is expressed in our corporate purpose: We create chemistry for a sustainable future.

Our mission and motivation is to grow profitably and make a positive contribution to society and the environment. For example, BASF's solutions help to protect the climate, avoid or recycle waste, use resources more efficiently, produce healthy and affordable food, and enable climate-smart mobility.

At the same time, we are undergoing **profound changes**. We need to transform our company, as we have done repeatedly in the more than 150-year history of BASF. This time, we are moving toward climate neutrality and the circular economy. This involves managing long-term policy decisions like the European Green Deal, overcoming the consequences of current geopolitical conflicts such as the war in Ukraine, and driving forward digitalization. All of this requires a clear vision as well as a high degree of creativity and flexibility.

Both long-term trends and short-term developments in an environment characterized by volatility and uncertainty are challenging for the chemical industry. At the same time, they also open up numerous opportunities for new business areas and innovative products.

We want to lead the way in the chemical industry and **responsibly shape the change** – with ambitious targets and a concrete roadmap: We are gradually switching our energy and raw materials supplies from fossil to renewable sources. We are adapting our Verbund structure to the new circumstances as the basis for resource-efficient, safe and reliable production. We are developing new, pioneering carbon-free and low-carbon production processes for our products. We are accelerating our innovation processes and deepening cooperation with customers, suppliers and other partners to develop high-performance products with a lower carbon footprint. We are developing recycling technologies for various waste streams to strengthen the circular economy. We are harnessing the many opportunities of digitalization across all areas of the company. We are systematically aligning our portfolio with growth areas and future technologies, and are integrating sustainability into our value chains even more strongly. We create a working environment in which our employees can thrive and contribute to BASF's long-term success.

 For more information on our strategic action areas, see page 28 onward

In this section:

Strategic Action Areas

Values and Global Standards

Business Models of the Segments

Targets and Target Achievement 2022

Investments and Portfolio Measures

Steering Concept

Sustainability Concept

Innovation

Good to know



Our customers in focus

BASF supplies products and services to around 82,000 customers from almost all sectors and countries around the world. Our customers are mainly global and small and medium-sized companies, but also include end consumers. We are continually refining our organizational structure so that our operating divisions can flexibly address specific market and customer requirements and differentiate themselves from the competition. The operating divisions pursue different business strategies – from cost leadership in basic chemicals to tailored system solutions for specific customer applications. Above and beyond this, we are intensifying cooperation with our customers to jointly leverage innovation and growth potential. For instance, we have established around 60 strategic customer networks to address the needs of our most important customers even better and more quickly.



Renewable energy is a central building block on BASF's journey to climate neutrality. To enable us to meet our growing demand in the future, we are gradually switching our supply agreements to green power and investing in our own plants. One example is the Hollandse Kust Zuid offshore wind farm currently under construction, which has a total capacity of 1.5 gigawatts.

Material topics in focus: **Climate Change**

GRI 3,302

Climate change is the greatest challenge of the 21st century. Swift and resolute action is needed to ensure that the targets agreed in the Paris Climate Agreement can be achieved. We stand by this responsibility. In many areas, products and innovations based on chemistry are the key to a climate-neutral future – from insulation foams for energy-efficient buildings, lightweight construction components and battery materials for e-mobility to sustainable agriculture.

At the same time, we are working intensively to significantly reduce the carbon footprint of our production and thus of our products. Our target: Net zero emissions by 2050.¹ We have set ourselves an ambitious milestone on this path. By 2030, we want to reduce greenhouse gas emissions by 25% compared with 2018 – while growing production volumes in parallel. Compared with 1990, this would translate into a reduction of around 60%. We are intensely pursuing our climate protection targets with investments of up to €4 billion by 2030. Our focus here is on five strategic levers:

- **Grey-to-green:** We are increasingly meeting our electricity needs from renewable sources. In 2022, the share of green power was 16%.
- **Power-to-steam:** In the future, we will increasingly rely on electrification and energy recovery in steam generation, for example, through the use of heat pumps or e-boilers.
- **New technologies:** We are developing pioneering carbon-free and low-carbon production processes, especially for emission-intensive basic chemicals such as hydrogen, olefins and aromatics.
- **Bio-based feedstocks:** We are increasingly replacing fossil resources with alternative raw materials. In 2022, for example, we procured around 1.2 million metric tons of renewable raw materials.
- **Continuous opex:** We are working to further improve the energy and process efficiency of our plants. In 2022 alone, BASF implemented more than 500 operational excellence measures.

We want to play an active and responsible role in shaping the transformation toward a climate-neutral society. This also requires

a political and regulatory environment that promotes innovation in climate protection, makes it possible to develop new processes that are competitive internationally and, above all, resolutely drives forward the expansion of renewable energies. Initial estimates suggest that at the Ludwigshafen site in Germany alone, we would need three to four times more green electricity than in 2021 to fully implement new, low-carbon electricity-based production processes. To meet this demand, we are investing in our own power assets and are increasingly buying green electricity on the market (make & buy approach).

We are also addressing the question of how climate change affects our sites. In Ludwigshafen, for example, we have been implementing a range of climate resilience measures for dealing with low water levels on the Rhine River since 2018, including an early warning system, multimodal transportation concepts, smarter management of cooling water and the development of an innovative type of barge for very low water levels. These measures already proved successful during the dry period in summer 2022.]

For more information on energy and climate protection, see page 135 onward

Our global climate protection targets

-25%

Reduction in our greenhouse gas emissions by 2030 compared with 2018¹

Net zero

Greenhouse gas emissions by 2050¹

¹ Scope 1 and Scope 2 (excluding the sale of energy to third parties, including offsetting)

Our Strategic Action Areas

GRI

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BASF's strategic orientation is founded on a comprehensive analysis of our markets, competitors and the economic environment. We continuously monitor global trends and short-term developments and anticipate the resulting opportunities and risks. The following six strategic action areas enable us to focus on our customers while strengthening our leading position in a competitive environment.

Innovation

Innovation is the bedrock of our success. BASF is a leader in the chemical industry with around 10,000 employees in research and development and R&D spending of around €2.3 billion. We want to expand this position by strengthening our research activities, especially in battery materials, polymer technologies and catalytic and biotechnological methods (see box on the right). In addition, we are expanding our cooperation with customers, universities, research institutions and other partners.

We reorganized our global research activities in 2022. Business and application-driven units that were previously part of three research divisions were integrated into the operating divisions, aligning them more closely with the needs of our customers. For greater efficiency and effectiveness, we have bundled research activities that are relevant to several operating divisions in the new cross-functional and cross-regional Group Research unit. This global research division supports our operating divisions' customer-specific R&D activities. It also drives forward cross-divisional projects on topics relevant to the entire Group, such as avoiding CO₂ in chemical processes and products, energy efficiency and recycling technologies.

Our **innovation pipeline** is geared to sustainability – especially climate protection and the circular economy. This lays the foundation for future growth: We are working intensively on fundamental innovations for products, processes and business models, for example, for the chemical recycling of plastics, battery and catalyst

Good to know



Driving sustainability with microorganisms

With its broad technological expertise, BASF is well positioned to develop innovative solutions for a sustainable future. One of our key technologies is white biotechnology. White biotechnology enables us to produce a wide range of products using a variety of feedstocks in an efficient, resource-conserving and flexible manner: biopolymers, essential ingredients for human and animal nutrition, crop protection products, flavors and fragrances, or ingredients for cosmetics. We also produce enzymes from fungi and bacteria for use in detergents. One example is BASF's protein-cleaving enzyme Lavergy® Pro, which removes tough stains even at low temperatures and in short wash cycles, thus saving energy and water.

Microorganisms are not just used to manufacture products, but at the end of the product life cycle as well. We are working to understand how microorganisms metabolize complex organic

compounds into energy, water, carbon dioxide and biomass. A fundamental understanding of such biological processes is needed to use this natural method and develop biodegradable products. In addition, digital tools are an important component of the research work to predict the properties and biodegradability of molecules and materials at a very early stage of product development, enabling their structures to be adapted accordingly. This is important for products that end up in wastewater treatment plants at the end of their life cycles, such as cosmetics, laundry detergents and dishwashing products. Another example is our certified biodegradable biopolymer ecovio®. This can be used to produce mulch films that can be plowed under after use in the field and completely metabolized by microorganisms.

technologies, low-carbon production of basic chemicals, and digital, climate-smart farming. At the same time, we are developing product improvements in all business units that offer our customers sustainability and competitive advantages. These include surface solutions for the aviation and wind power industries, bio-based and biodegradable active ingredients for the cosmetics, detergent and cleaner industries, and engineering plastics based on renewable raw materials.

 For more information on innovation, see page 49 onward

Sustainability

We believe that the economy, environment and society are inextricably linked and interrelated. We want to create value in all three areas with our products, solutions and technologies. We pledged our commitment to sustainability in 1994 and since then, have systematically aligned our activities with the principles of sustainability. We want to further strengthen our position as a pioneer for sustainable solutions. We see sustainability as an integral part of our strategy as well as our targets, steering processes and business models. In doing so, our aim is to be a responsible and attractive partner for our customers, develop new growth areas and lay the foundation for the long-term success of our company. Our approach covers the entire value chain – from the responsible procurement of our raw materials and safety and resource efficiency in production to sustainable solutions for our customers.

Protecting the climate is of central importance for us here. Since 1990, we have more than halved our carbon emissions while simultaneously doubling sales product volumes. By 2030, we want to reduce our absolute CO₂ emissions by 25% compared with 2018 and will invest up to €4 billion to this end. By 2050, we aim to achieve net zero greenhouse gas emissions from our production sites and our energy purchases. We are pursuing **ambitious climate protection targets** with our carbon management. This comprises five strategic levers that we are systematically driving forward to reduce our greenhouse gas emissions (see page 27).

In the future, we want to align our product portfolio even more strongly with climate protection, carbon neutrality and circularity in order to meet the growing sustainability demands in our markets with innovative solutions. That is why we are updating our Sustainable Solution Steering methodology for steering the **product portfolio** based on sustainability criteria (see page 45). We will apply the new methodology for the first time in the 2023 business year. In addition, a digital solution enables us to calculate the carbon footprint of our approximately 45,000 sales products – from raw materials extraction to the factory gate (“cradle-to-gate”). This creates transparency around the carbon intensity of our products and at the same time provides important starting points for reducing greenhouse gas emissions along our value chains.

 For more information on energy and climate protection and our carbon footprint, see page 135 onward
 For more information on the circular economy, see page 43 onward

Production

Our core business is the production and processing of chemicals. Our strength here lies in the **Verbund** and its integrated value chains. This enables us to achieve efficient, reliable and CO₂-optimized production and leverages synergies in the development and application of new technologies and the use of digital solutions. At the same time, the Verbund is the foundation for meeting the increasingly diverse needs of our customers and markets with a differentiated offering. Our comprehensive product portfolio ranges from basic chemicals to custom system solutions.

Our strategy is to produce locally for local markets, close to our customers. We plan to invest €28.8 billion worldwide between now and 2027 to expand our capacities based on market demand and to further increase the availability, efficiency and flexibility of our plants. In particular, we want to benefit from the strong growth of the chemical market in Asia (see “Portfolio”). Our global production footprint contributes to the regional diversification of our sales and earnings distribution, making it part of our risk management. It helps us to compensate for economic weaknesses and a lack of growth

prospects in individual markets within the BASF Group. This currently applies to Europe and especially Germany, where high natural gas prices and a challenging regulatory environment are negatively impacting our competitiveness and our growth.

 For more information on our production sites and the Verbund structure, see page 20 onward

Digitalization

We want to leverage the diverse growth potential of digitalization, seize the associated opportunities to the benefit of our customers and strengthen our competitiveness. To achieve this, we promote digital skills among our employees, cooperate with partners and make digital technologies and ways of working an integral part of our business.

Digitalizing our plants and systematically analyzing data enables us to further automate processes and in this way, manage the capacity, availability and efficiency of our plants in line with market conditions, for example, by simulating value streams within our Verbund structure or through predictive maintenance. Linking data from different sources and using artificial intelligence for smart data analysis opens up numerous opportunities for us to manage our business more efficiently and improve our processes, for example, in logistics.

The combination of products, services and digital offerings also creates **new business models** and advantages for our customers, such as in agriculture or the personal care industry. In addition, digitalization enables us to further strengthen our innovative power. BASF has one of the most powerful supercomputers in the chemical industry – Quriosity. We use it to accelerate complex computing processes such as the simulation of molecules, for example. At the same time, we are working on groundbreaking technologies such as quantum computing, including as a founding member of the Quantum Technology and Application Consortium (QUTAC). We are also involved in other digitalization initiatives such as the Catena-X

network, where we are working with partners to develop a system for standardized data exchange in the automotive value chain.

Portfolio

We are orienting our portfolio even more strongly toward **innovation-driven growth areas with high Verbund synergies**. Following major acquisitions (battery materials, engineering plastics, farming solutions) and divestitures (pigments, construction chemicals, paper and water chemicals) in recent years, we continued on this course in 2022 with divestitures and division-specific partnerships. As planned, we divested the kaolin minerals business to KaMin and the attapulgite business to Clariant.

At the same time, we are strengthening the basis for our organic growth with investments. In North America, for example, we launched the third and final phase of the MDI expansion at the Geismar site in Louisiana in 2022. Examples in Europe include the construction of a new hexamethylenediamine (HMD) plant at our site in Chalampé, France, and the expansion of our polyamide 6.6 production in Freiburg, Germany. A new world-scale production plant for alkylethanolamines will be built at the Verbund site in Antwerp, Belgium, by 2024. The Asian market will play a key role in our future growth. With a share of more than 45%, China is already by far the world's largest chemical market and is a key driver of growth in global chemical production. We have a strong production, sales and innovation base in Asia, and in particular in **China**, which we will continue to expand. Our largest project is the new Verbund site in Zhanjiang in the southern Chinese province of Guangdong. We granted final approval for its construction in 2022. Once completed, it will be BASF's third-largest Verbund site after Ludwigshafen, Germany, and Antwerp, Belgium. Following the successful startup of the first plant for the production of engineering plastics in August 2022, the focus in Zhanjiang is now on the step-by-step establishment of the Verbund structure, starting with the construction of a steam cracker along with downstream plants for the production of petrochemicals and intermediates. Work is

also underway to complete a plant for thermoplastic polyurethanes and to build a plant for neopentyl glycol. In addition, the expansion of our Verbund site in Nanjing, China, operated together with Sinopec, started operation in 2022. New plants for products from the Petrochemicals and Intermediates divisions will be built there by the end of 2023.

We also further expanded our global **battery materials business** in 2022. This includes investments to increase our production capacities and to establish innovative recycling concepts in the three key regions of Europe, North America and Asia. At the Schwarzeide site in Germany, we started the multi-step commissioning process for a new production plant for cathode active materials¹ at the end of 2022, as planned. We are also building a prototype plant for battery recycling in Schwarzeide,¹ which is scheduled for startup in 2023, as well as a plant for the production of black mass from batteries on a commercial scale (planned startup: 2024). We are working on the integration of our production site in Harjavalta, Finland,² which supplies precursors for cathode active materials. Alongside our existing sites in North America, we are looking into investing in a new production site for cathode active materials and battery recycling in Bécancour, Canada. The new site allows for ample space to expand up to 100 kilotons of cathode active materials per year with potential for fully integrated precursor cathode active materials supply. We are also currently expanding the capacity of BASF Shanshan Battery Materials Co., Ltd. in China to 100 kilotons per year. The multi-step commissioning process for the new production lines at the Changsha and Shizuishan sites started in late 2022 as planned. In Onoda, Japan, work to expand production capacities for cathode active materials at BASF TODA Battery Materials LLC has also been underway since the end of 2022. This is scheduled for startup in the second half of 2024. Our production facilities in all key regions and growing capacities enable us to serve battery cell and automotive

manufacturers in all relevant markets even more extensively with tailored and sustainable solutions.

 For more information on material investments and portfolio measures, see page [37](#) onward

Employees

Our employees are key to BASF's success. That is why we believe that it is important to have an attractive total offer package and an inspiring working environment that fosters and develops employees' individual talents and enables them and their teams to perform at their best. We are pursuing three action areas to make our high-performance organization even more so: empowerment, differentiation and simplification of structures and processes. At the same time, we encourage and promote a leadership culture that empowers our employees to respond to customer needs quickly and efficiently with a solution orientation. We value diversity in people, opinions and experience as being crucial to creativity and innovation. We embrace bold ideas, help our employees to implement them and learn from setbacks. This is founded on an open feedback and leadership culture based on mutual trust, respect and dedication to top performance.

 For more information on employees, see page [101](#) onward

¹ Our investment and research activities in Schwarzeide and Ludwigshafen, Germany, receive funding from the German Federal Ministry for Economic Affairs and Climate Action and the Ministry for Economic Affairs, Labor and Energy of the German state of Brandenburg under the IPCEI on Batteries (funding code 16BZF101A/B).

² The investment in Finland is co-financed by Business Finland, the Finnish government organization for innovation funding and trade, travel and investment promotion.



BASF welcomes all talents regardless of gender, cultural, religious or social background, sexual orientation or identity, origin or physical integrity. BASF also shows its colors during Pride Month and raises the rainbow flag at many sites around the world as a sign of openness, diversity, tolerance and respect.

Material topics in focus:

Our Values and Global Standards

GRI 2

We want to help change the world for the better. This is what drives us and is at the core of our corporate purpose: We create chemistry for a sustainable future. How we act is critical. BASF's four corporate values serve as a compass for us worldwide and are simultaneously an expression of our ambitions and our shared identity.

Together with our Code of Conduct and our global standards, our CORE values lay the foundation for responsible conduct and trust-based relationships with our stakeholders. They define how we want to work together – as a team, with our customers and our partners:

- **C – creative:** We make great products and solutions for our customers. This is why we embrace bold ideas and give them space to grow. We act with optimism and inspire one another.
- **O – open:** We value diversity, in people, opinions and experience. This is why we foster feedback based on honesty, respect and mutual trust. We learn from setbacks.
- **R – responsible:** We value the health and safety of people above all else. We make sustainability part of every decision. We are committed to strict compliance and environmental standards.
- **E – entrepreneurial:** We focus on our customers, as individuals and as a company. We seize opportunities and think ahead. We take ownership and embrace personal accountability.

Our standards are based on, and in some cases, exceed existing laws and regulations and take internationally recognized principles into account. We respect and promote:

- The Universal Declaration of Human Rights and the two U.N. Human Rights Covenants
- The 10 principles of the U.N. Global Compact
- The core labor standards of the ILO and the Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy
- The OECD Guidelines for Multinational Enterprises

- The Responsible Care® Global Charter
- The German Corporate Governance Code

We stipulate binding rules for our employees with our standards and guidelines that apply throughout the Group. Our aim is to prevent compliance violations from the outset through compulsory training for all employees and special training for leaders. The Corporate Audit department continuously monitors compliance with requirements. We regularly assess our performance in environmental protection, health and safety as part of our Responsible Care Management System. We realize our responsibility to behave in accordance with international and social standards largely in three ways: through our Compliance Program, including our Code of Conduct and compliance hotlines, through close dialog with stakeholders and through the global management process to respect international labor norms. We pursue sustainability-oriented supply chain management and expect our business partners to comply with prevailing laws, regulations and internationally recognized principles. Here, too, we have established appropriate monitoring systems.]

For more information on human and labor rights, see page 109 onward

For more information on compliance, see page 179 onward

For more information on responsible procurement and the German Supply Chain Due Diligence Act, see page 114 onward

For more information on the Responsible Care Management System, see page 123 onward

Business Models of the Segments

Our segments' business models are aligned with their specific strategic action areas. Innovation and sustainability are the cornerstones that will enable us to continue to be successful with our products and with our customers in the future and to collectively master the challenges that lie ahead.

Chemicals

The Chemicals segment is at the **heart of the Verbund**. Its production facilities reliably supply BASF's other segments with chemicals to produce higher value-added products and in this way, contribute to the organic growth of the BASF Group. It also markets high-quality basic chemicals and intermediates to customers in downstream industries.

The segment creates value through process and product innovation and invests in research and development to implement new, sustainable technologies and make existing technologies even more efficient. Thanks to our integrated manufacturing processes, the carbon footprint of some of our products is significantly lower than that of our competitors. Technological leadership, operational excellence and a clear focus on individual value chains are among our most important competitive advantages. We concentrate on the essential success factors of the traditional chemicals business: leveraging economies of scale and the advantages of our Verbund, high asset availability, continuous optimization of access to raw materials, lean and energy efficient processes, and reliable, cost-effective logistics. We are continuously developing our value chains and are expanding our market position – especially in Asia – with investments and collaborations in growth markets.

Furthermore, we are constantly improving our **global production structures** and aligning these with regional market requirements. For example, we are modernizing our chloroformates and acid

Strategic alignment of the segments						
	Chemicals	Materials	Industrial Solutions	Surface Technologies	Nutrition & Care	Agricultural Solutions
Verbund synergies			Catalysis			
			Process technology			
		Automotive industry				
			Recycling and renewable raw materials			Biosciences
				Formulation		
					Digitalization and artificial intelligence	
Strategic focus	Economies of scale in basic chemicals and intermediates	High-performance plastics	Additives platform	Surface technology platform	Ingredients for consumer products	Connected offer across technologies for farmers
Innovation and sustainability focus	Emission-reduced processes	Applications, recycled and bio-based materials	Polymer dispersions, resins	Battery materials, coatings	Biotechnology, natural active ingredients, formulations	Active ingredients, seeds and traits, digital solutions

chlorides plant in Ludwigshafen, Germany so that we can continue to reliably support our customers' growth with these products.

Materials

BASF's Materials segment supplies high-quality plastics precursors and develops new plastics applications, high-performance materials, systems and digital solutions. Our product portfolio is unique in the industry. We aim to **grow mainly organically** by differentiating ourselves with our application expertise and industry knowledge

and by creating maximum value in our isocyanate and polyamide value chains. Advanced material simulation capabilities are a unique selling point in the industry and enable us to meet customer requirements individually.

To provide added value to our customers and society, we are working on new circular economy solutions and more sustainable production processes that use resources as sustainably as possible. BASF is active along the value chain for important durable plastics, from monomers to polymers and their formulated specialties. With

our specific technology knowledge, we are working to **shape and close cycles** and convert plastics back into primary products for the chemical industry. This is how we help to reduce plastic waste, save fossil resources and avoid carbon emissions in plastics production. Examples include Ultramid® Cycled™, which is made from raw material based on end-of-life tires, biomass balance products and certified compostable bioplastics. With these solutions, we aim to meet growing demands in all key markets and help our customers to meet their sustainability targets.

We are continuously expanding the range of applications in our portfolio with **tailor-made services and product offerings**. Our global production network enables us to provide our solutions wherever our customers are.

Industrial Solutions

The Industrial Solutions segment markets and develops **ingredients and additives for industrial applications**. These include fuel and lubricant solutions, ingredients for paints and coatings, electronic materials and plastic additives. We concentrate on research and development with the aim of enabling more efficient resource use and developing more sustainable products and processes, for example, in polymer dispersions, resins and plastic additives. At the same time, this also enables our customers to contribute to sustainability through their applications and processes. Other focus areas are efficient production setups, backward integration in our Production Verbund's value chains, capacity management, and technology and cost leadership.

Our global presence enables us to operate close to our customers and their industries. As a reliable partner, we offer high-quality products at attractive prices. We work on new solutions together with our customers and strive for long-term partnerships that create profitable growth opportunities for both sides. To achieve this, we draw on our innovative strength and our many years of experience and in-depth industry expertise. Through our in-depth application knowledge and technological innovations, we strengthen customer

relationships in key industries such as the automotive, electronics, plastics and coatings industries.

Surface Technologies

In the Surface Technologies segment, the focus is on the **protection, modification and development of surfaces**. Together with our customers, we develop novel products and technologies for catalysts, coatings and battery materials. We also offer precious and base metal as well as surface treatment services. Our aim is to drive growth by leveraging our portfolio of technologies to find the best solution for our customers in terms of functionality and cost. This in turn helps our customers to drive forward innovation in their industries and contribute to sustainable development.

Key growth drivers for us are the positive medium-term development of the automotive market, especially in Asia, the trend toward **sustainable, low-emission mobility**, and the associated rise in demand for battery materials for electromobility. We are developing customized, more sustainable solutions in these growth areas for battery materials, emission control, recycling and functional coatings in close cooperation with our customers. Our specialties and system solutions in these areas enable customers to stand out from their competitors.

The automotive industry is currently undergoing a fundamental transformation. As one of the largest chemicals suppliers to this industry, we will further strengthen our focus on battery materials and recycling and pursue our ambitious growth plan. We are also establishing a new entity (BASF Environmental Catalyst and Metal Solutions) within the Catalysts division for mobile emissions catalysts, automotive catalysts recycling and associated precious metal services. The carve-out process started in January 2022. The new organizational structure prepares the business for the upcoming changes in the internal combustion engine market and allows for future strategic options.

Nutrition & Care

In the Nutrition & Care segment, we strive to expand our position as a leading **provider for nutrition and care ingredients for consumer applications**. We will continue to develop our capabilities in areas such as biotechnology and broaden our portfolio with bio-based and biodegradable products. One example is the Verdessence™ product line launched in 2022, which offers sustainably sourced biopolymers for personal care applications. This supports our customers in meeting the ever-growing consumer demand for natural and organic cosmetics.

Our enzymes business enables us to pursue a targeted, accelerated marketing strategy and expand our portfolio for natural and biotechnological products. Furthermore, we are investing in natural and biological substances. BASF supplies excipients for human therapeutic drug formulation. Our biopharma ingredients serve a variety of markets, from bioprocessing and formulation of proteins to vaccines and antibodies.

In addition, acquisitions expand our business with new business models and sustainability trends in consumer markets. Future growth in our markets will be driven by trends like growing consumer awareness and the resulting demand for sustainable product solutions, natural and organic ingredients and their traceability. Moreover, the shift toward individualization and local production supports new players and business models. Digitalization, a focused technology and product portfolio, and close cooperation with our customers is crucial to meeting these dynamic market requirements both now and in the future.

Agricultural Solutions

In the Agricultural Solutions segment, we are working to achieve the right balance between economic, environmental and social value creation for a sustainable and efficient agricultural sector. **Efficient farming** is fundamental given that the world's population is expected to increase by about two billion¹ people between 2022 and 2050. While the demand for food, feed, fiber and energy is growing, natural resources are limited. Balanced agriculture is a key enabler in producing enough healthy, affordable food and responding to changing consumer behavior while reducing the impact on the environment.

As one of the world's leading agricultural solutions companies, we are making a positive impact on sustainable agriculture and food systems. Our **innovation-driven strategy** for agriculture focuses on selected crops and their appropriate cultivation systems in specific regions. We integrate sustainability criteria into all business and portfolio decisions. In doing so, we help farmers achieve better yield, protect the planet and produce economically.

We leverage our **expertise in research and development** and our deep understanding of the way individual growers manage their farms to provide offers across technologies. These include novel solutions for seeds, traits, crop protection and digital products tailored to the farming needs of their region and crop systems.

Good to know

We are committed to sustainable farming to help farmers not only produce more, but also better. We focus on four areas in particular:

Climate-smart farming: We help farmers tackle the pressing challenges of climate change with the right combination of technologies designed to increase yield even under changing climatic conditions, make farm management easier and more effective, and at the same time, reduce the impact on the environment. Our technologies include products that enable greenhouse gas emissions reductions, for example, nitrogen management products to improve fertilizer efficiency, or herbicides that facilitate conservation tillage. Moreover, we develop seeds and traits for more stress-resilient crops and are working on using bacteria to improve nitrogen availability to plants.

Sustainable solutions: We systematically steer our innovation pipeline according to sustainability criteria from an early stage. This enables us to continually develop innovations that offer added value for farmers, the environment and society. We also assess each product in our portfolio with respect to its contribution to sustainability. This is one of the levers we use to systematically steer our portfolio to increase our substantial contribution to sustainability.

Digital farming: Digitalization will transform agriculture and make it more resource-efficient and sustainable. Our digital farming solutions help farmers to produce more with less and grow their business profitably while improving their environmental footprint.

Smart stewardship: Our tools and services are tailored to farmers' daily work. Farmers get the support they need to use our products safely: access to tools and services, protective equipment, customized training, digital solutions and new and future-oriented application technologies such as drones.

¹ Source: U.N. World Population Prospects 2022

Targets and Target Achievement 2022

For us, business success tomorrow means creating value for the environment, society and business. That is why we pursue ambitious targets along our entire value chain. We report transparently on target achievement so that our stakeholders can track our progress.

Our objective is profitable growth: We want to grow sales volumes faster than global chemical production, further increase our profitability, achieve a return on capital employed (ROCE) considerably above the cost of capital percentage and increase the dividend per share every year based on a strong free cash flow.

In addition to these financial targets, we have set ourselves broad sustainability targets. We want to significantly reduce our CO₂ emissions in the coming years and align our product portfolio even more strongly with climate protection and the circular economy. To achieve this, we are updating the methodology used to assess our product portfolio against defined sustainability criteria and will apply it for the first time in 2023 (see page 45). We are also working to strengthen sustainability in our supply chains and use resources

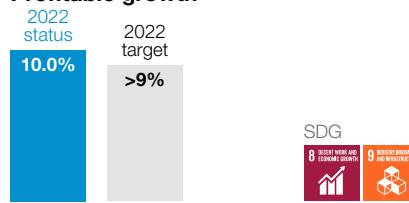
responsibly. We want to further improve safety in production. Furthermore, we aim to promote diversity within the company and create a working environment in which our employees feel that they can thrive and perform at their best.

The objective of these targets is to steer our business into a more sustainable future, and at the same time, contribute to the United Nations' Sustainable Development Goals (SDGs). We are focusing here on issues that we as a company can influence – especially SDG 2 (Zero hunger), SDG 5 (Gender equality), SDG 6 (Clean water and sanitation), SDG 7 (Affordable and clean energy), SDG 8 (Decent work and economic growth), SDG 12 (Responsible consumption and production) and SDG 13 (Climate action).

For more information on financial indicators, see page 52 onward

For more information on sustainability along the value chain, see page 100 onward

Profitable growth



Most important key performance indicator / reasonable assurance

Achieve a **return on capital employed (ROCE)** considerably above the cost of capital percentage every year

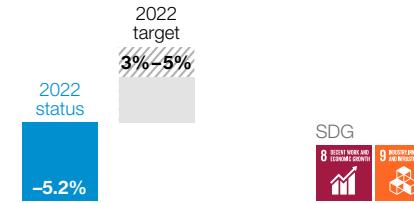
For more, see Results of Operations from page 57 onward



Reasonable assurance

Grow **sales volumes** faster than global chemical production every year

For more, see Results of Operations from page 56 onward



Reasonable assurance

Increase **EBITDA before special items** by 3% to 5% per year

For more, see Results of Operations from page 58 onward



Reasonable assurance

Increase the **dividend per share** every year based on a strong free cash flow

For more, see BASF on the Capital Market on page 13

Good to know

Most important KPIs

BASF has set itself ambitious targets along the value chain. Two of these indicators are particularly important:

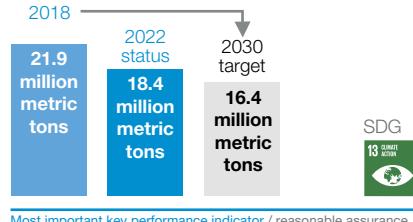
- Return on capital employed (ROCE)
- Absolute CO₂ emissions

As our most important key performance indicators (KPIs), these two metrics are the main indicators used to steer the BASF Group. We also use ROCE for employee incentivization throughout the Group. The achievement of climate protection targets also influences the compensation of members of the Board of Executive Directors and senior executives.

For more information on the steering concept, see page 41 onward

For more information on the compensation of the Board of Executive Directors, see baf.com/compensationreport

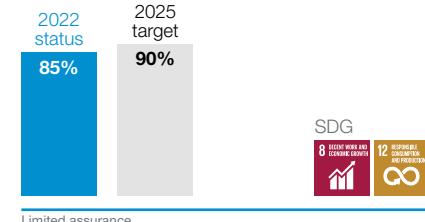
¹ Dividend proposed by the Board of Executive Directors

Effective climate protection

Most important key performance indicator / reasonable assurance

Reduce our absolute **CO₂ emissions**¹ by 25% by 2030 (baseline: 2018)

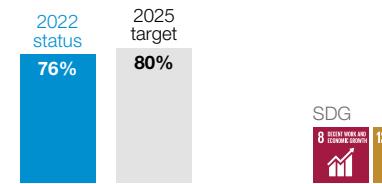
For more, see Energy and Climate Protection from page 135 onward

Responsible procurement

Limited assurance

Cover 90% of our relevant spend with **sustainability evaluations** by 2025

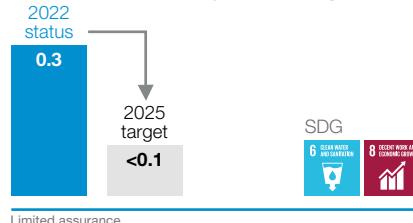
For more, see Supplier Management from page 114 onward



Limited assurance

Have 80% of our suppliers improve their **sustainability performance** upon re-evaluation

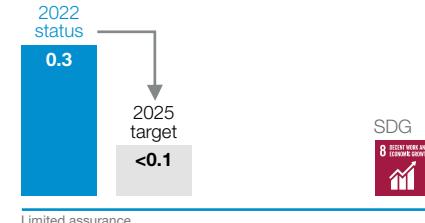
For more, see Supplier Management from page 114 onward

Resource efficiency and safe production

Limited assurance

Reduce worldwide **process safety incidents** per 200,000 working hours to ≤0.1 by 2025²

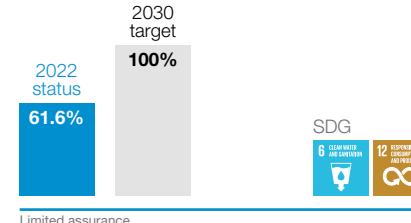
For more, see Process Safety from page 126 onward



Limited assurance

Reduce the worldwide **lost-time injury rate** per 200,000 working hours to ≤0.1 by 2025²

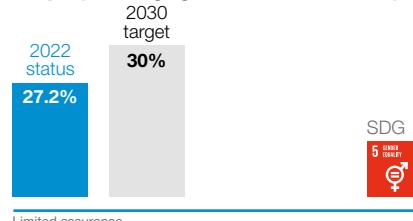
For more, see Occupational Safety on page 126



Limited assurance

Introduce **sustainable water management** at our production sites in water stress areas and at our Verbund sites by 2030

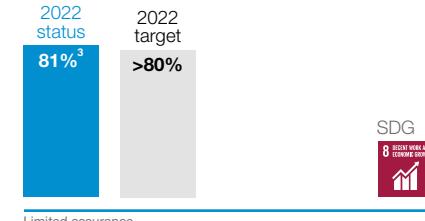
For more, see Water from page 144 onward

Employee engagement and diversity

Limited assurance

Increase the proportion of **women in leadership positions** with disciplinary responsibility to 30% by 2030

For more, see Employees from page 107 onward



Limited assurance

More than 80% of our **employees** feel that at BASF, they can thrive and perform at their best

For more, see Employees from page 102 onward

Reduction target

¹ Scope 1 and Scope 2 (excluding the sale of energy to third parties, including offsetting). The target includes greenhouse gases according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents (CO₂e). The baseline year is 2018.

² We will update the safety targets and report according to a new system in 2023.

³ We regularly calculate the employee engagement level. The most recent survey was conducted in 2022.

Material Investments and Portfolio Measures

Investments are an essential building block for driving our growth and at the same time, achieving our climate targets. That is why we make targeted investments in modern and more sustainable technologies and processes. Our major growth projects help us to reach this goal. We are continuously optimizing our portfolio through targeted acquisitions and divestitures.

At a glance

€4.1 billion

Capex¹ in 2022

€28.8 billion

Capex planned for 2023 to 2027

By investing in our plants, we create the conditions for the profitable growth we strive for and continuously improve the efficiency of existing production processes. Investments in new technologies and in the transformation of our energy supply will help to achieve our growth targets and our ambitious climate targets. For the period from 2023 to 2027, we are planning capital expenditures (capex)¹ totaling €28.8 billion, including €13.6 billion for our major growth projects.²

 For more information on our investments from 2023 onward, see page 156

Investments and acquisitions 2022

	Investments	Acquisitions	Total
Intangible assets	125	–	125
of which goodwill	–	–	–
Property, plant and equipment ^a	4,842	–	4,842
Total	4,967	–	4,967

^a Including restoration obligations, IT investments and right-of-use assets arising from leases

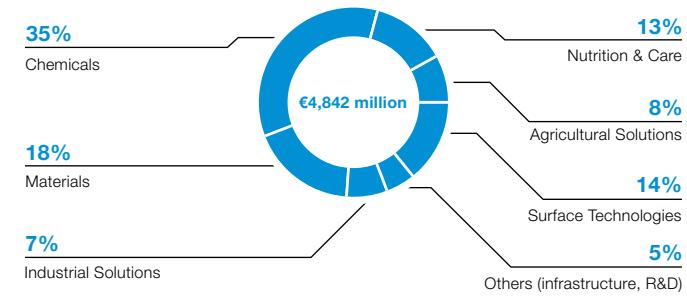
We continued to drive forward our major growth projects in 2022 and further expanded our position in our three key regions: Europe, Asia Pacific and North America. The Asia Pacific region and China in particular, which is expected to expand its share of the global chemical market to well over 50% by 2030, will continue to play a key role here. To serve the increasing needs of various growth industries in this region, we are continuously expanding our market position in China, for example, with the construction of our new smart Verbund site in Zhanjiang in the southern Chinese province of Guangdong (see pages 38 and 39). In North America, we further expanded our production capacities in the isocyanates value chain in 2022, for example (see page 38). We also continued to invest in Europe, especially in our battery materials business in Schwarzheide, Germany, and Harjavalta, Finland (see page 39).

In addition, we are refining our portfolio through acquisitions that promise above-average profitable growth and help to expand our market position in a targeted manner. A key consideration is that these are innovation-driven, offer a technological differentiation, or make new, sustainable business models possible.

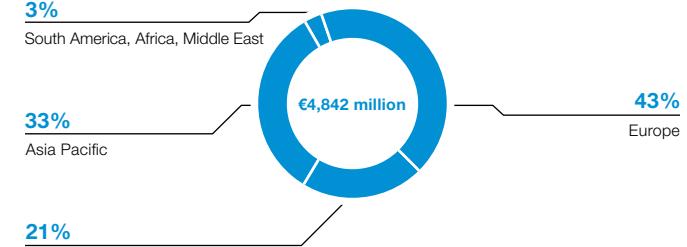
Investments in the segments and regions

Investments in property, plant and equipment amounted to €4,842 million in 2022 (2021: €4,078 million). Capex accounted for €4,148 million of this amount (2021: €3,363 million). Our investments in 2022 focused on the Chemicals, Materials, Surface Technologies and Nutrition & Care segments.

Additions to property, plant and equipment^a by segment in 2022



Additions to property, plant and equipment^a by region in 2022



^a Including restoration obligations, IT investments and right-of-use assets arising from leases

¹ Additions to property, plant and equipment excluding acquisitions, restoration obligations, IT investments and right-of-use assets arising from leases

² Major growth projects are the construction of our future Verbund site in Zhanjiang, China, as well as our battery materials activities.

Chemicals

Strategically, our investments concentrate on the growth markets like China to support the growth of our local customers. In 2022, we moved forward with the further expansion of the site in Nanjing, China, together with our partner Sinopec to strengthen the joint production of chemical products in China. For instance, we are currently expanding our production capacities for propionic aldehyde, propionic acid, purified ethylene oxide, ethanolamines and ethyleneamines, and are building a new tert-butyl acrylate plant. The new and expanded plants are scheduled to come onstream in 2023.

We are building another Verbund site in Zhanjiang in the southern Chinese province of Guangdong. In July 2022, BASF granted final approval for construction. The site will be constructed in several phases. A steam cracker and several downstream plants for the production of petrochemicals and intermediates, among other products, are currently being built. As part of the Verbund, these plants should be operational from late 2025.

We are expanding the 2-ethylhexanoic acid plant in Kuantan, Malaysia, with our partner PETRONAS Chemicals Group Berhad. Startup is planned for 2024.

At our Verbund site in Antwerp, Belgium, we are significantly expanding our ethylene oxide plant. The project also includes several downstream plants, for example, to produce alkylethanolamines and surfactants. The expanded ethylene oxide capacities are scheduled to come onstream in 2023.

Materials

In the Materials segment, the expansion of the methylene diphenyl diisocyanate (MDI) plant in Geismar, Louisiana, continued as planned. The final expansion will increase production capacity to approximately 600,000 metric tons per year to support the growth

Overview of material investments				
Segment	Location	Project	Start-up	
Chemicals	Antwerp, Belgium	Capacity expansion at ethylene oxide plant	2023	
		Construction of a new alkylethanolamines plant	2024	
		Capacity expansion at 2-ethylhexanoic acid plant ^a	2024	
		Modernization of chloroformates and acid chlorides plant	2025	
		Capacity expansion at plants for propionic aldehyde, propionic acid, purified ethylene oxide, ethanolamines and ethyleneamines, and construction of a new tert-butyl acrylate plant ^b	2023	
	Zhanjiang, China ^c	Construction of a new steam cracker and plants for ethylene oxide, monoethylene glycol, polyethylene, oxo-C4 alcohols, acrylic monomers and neopentyl glycol	2025	
	Chalampé, France	Construction of a world-scale production plant for HMD	2024	
Materials		Capacity expansion at MDI plants	2026	
		Construction of an engineering plastics plant	2022	
Zhanjiang, China ^c	Construction of a new thermoplastic polyurethane plant	2023		
	Capacity expansion at acrylics dispersions plant	2024		
	Capacity expansion at sulfuric acid plant	2023		
	Capacity expansion for synthetic esters	2022		
	Capacity expansion for antioxidants (Irganox®)	2022		
Industrial Solutions	Huizhou, China	Capacity expansion for hindered amine light stabilizers (HALS)	2023	
		Capacity expansion at mobile emissions catalysts plant	2022	
		Construction of a precursor plant for cathode active materials	2023	
		Construction of a new recycling facility for precious metals	2023	
		Construction of a cathode active materials plant	2023	
	Schwarzeide, Germany	Construction of a battery recycling prototype plant	2023	
		Capacity expansion for alkoxylates	2023	
Surface Technologies	Antwerp, Belgium	Gradual upgrade of production plants in accordance with the Good Manufacturing Practice Standard issued by the European Federation for Cosmetic Ingredients (EFfCI)	2023	
		New production line for UV filters	2023	
		Capacity expansion at methane sulfonic acid plant	2022	
		Capacity expansion at vitamin A plant	2023	
	Beaumont, Texas and Hannibal, Missouri	Modernization of site infrastructure	2022	
		Traceability of agrochemicals based on digital identification	2024	
		Reduction of organic waste	2023	
Agricultural Solutions	Singapore	New formulation hub for crop protection products	2022	

^a Operated by a fully consolidated joint venture with PETRONAS Chemicals Group Berhad

^b Operated by a joint venture with Sinopec

^c The Verbund site will be built and commissioned in several phases.

^d This project will be implemented in Genay and Graveline, France, in Ludwigshafen, Germany, and in Tarragona, Spain.

of BASF's North American MDI customers. Including the first and second phases, the investment volume totals around \$1 billion.

The first plant at the smart Verbund site in Zhanjiang, China, started up in August 2022. It has a capacity of 60,000 metric tons of engineering plastics compounds per year, bringing BASF's total capacity of engineering plastics in Asia Pacific to 420,000 metric tons. The new plant enables BASF to meet the growing demand from its customers, particularly in the automotive and electronics industries. The next startup in Zhanjiang is planned for 2023: a plant for the production of thermoplastic polyurethanes (TPU).

In Europe, BASF is investing in a new world-scale production plant for hexamethylenediamine (HMD) at the Chalampé site in France. The new plant, which is scheduled to start operations in 2024, will increase BASF's annual HMD production capacity to 260,000 metric tons.

Industrial Solutions

At the Jurong site in Singapore, we expanded global production capacity for the antioxidant Irganox® 1010. With the completion of the project in 2022, BASF can now better serve the growing demand from customers in Asia and the Middle East. In addition, BASF is investing in production capacity for hindered amine light stabilizers (HALS) at its sites in Lampertheim, Germany, and Pontecchio Marconi, Italy. As part of a multi-step investment plan, BASF aims to serve the growing demand for light stabilizers used in durable plastics applications and increase supply security for customers worldwide.

To ensure the supply of high-quality dispersions solutions for the South Asian market, we are expanding our dispersions capacities in Huizhou, China, with an additional production line. Startup is expected in the first half of 2024.

Surface Technologies

We aim to expand our position as a leading and innovative provider of battery materials and recycling solutions and expect to benefit from the strong growth in this market segment. A global, customer-focused production network for battery materials is crucial here. Construction of our production plant for cathode materials in Schwarzeide, Germany, continued in 2022. It is scheduled to start commercial production in 2023. We are working on the integration of our production site in Harjavalta, Finland, which will supply precursors for cathode active materials. The two plants will initially produce cathode active materials for around 20 gigawatt hours of cell capacity per year. With these investments in Finland and Germany, BASF aims to become the first cathode active materials supplier with local production capacities in all of what are currently the main markets: China, Japan, North America and Europe.

In addition, the construction of our new battery recycling prototype plant in Schwarzeide continued on schedule in 2022. Startup is planned for 2023. The prototype plant will allow for the development of operating procedures and optimization of technology to deliver superior returns of lithium, nickel, cobalt and manganese from end-of-life lithium-ion batteries and unused process materials.

Nutrition & Care

The expansion of the vitamin A acetate plant in Ludwigshafen, Germany, was completed in 2021. BASF is now strengthening its market position for vitamin A for the animal nutrition industry with the expansion of its world-scale formulation capacities at its Verbund site in Ludwigshafen, which began in 2021. Startup is planned for mid-2023. We also invested in the expansion of alkoxylate capacities at the Verbund site in Antwerp, Belgium.

In the second quarter of 2022, BASF started up the new methane sulfonic acid plant at its Verbund site in Ludwigshafen. This increases BASF's methane sulfonic acid capacities from 30,000 to

50,000 metric tons per year in response to growing cross-industry demand, strengthening its position as a leading global producer.

Agricultural Solutions

The investment in a formulation hub for crop protection products in Singapore, which started up in 2022, ensures that multiple formulation technologies are produced close to farmers in Asia Pacific. In North America, we continued to modernize site infrastructure and completed this on schedule. We are also investing in the traceability of agrochemicals based on digital identification in Europe. Further investments are being made to reduce CO₂ emissions and organic waste in our plants. Between 2023 and 2027, we plan to invest around €1 billion in developing and expanding our plants and infrastructure, including state-of-the-art R&D facilities, and in our production and formulation capacities for active ingredients as well as for seed solutions to meet our continuing high demand for our innovative solutions in the future.

 For more information on our segments, see page 72 onward

Acquisitions

We did not make any acquisitions in the 2022 business year.

Divestitures

On April 12, 2022, BASF completed the sale of a 51% share in HKZ Investor Holding B.V., Arnhem, Netherlands, the holding company for the investment in the Hollandse Kust Zuid (HKZ) wind farm, to Allianz Capital Partners, Luxembourg, acting as party to the contract on behalf of Allianz Insurance Companies. BASF had acquired 49.5% of HKZ from Vattenfall in the third quarter of 2021. BASF will receive most of the power produced by its originally acquired share of 49.5% of HKZ under a long-term fixed-price power purchasing agreement.

 For more information on this divestiture, see Note 3 to the Consolidated Financial Statements from page 216 onward

On September 30, 2022, BASF completed the divestiture of its kaolin minerals business to KaMin LLC./CADAM S.A., a global performance minerals company headquartered in Macon, Georgia. The divestiture comprised the production hub with sites in Daveyville, Toddville, Edgar, Gordon and related mines, reserves, and mills in Toombsboro and Sandersville in Georgia. The refinery catalysts operations located at the same site were not part of the divestiture. Until the divestiture, the kaolin minerals business was part of the Performance Chemicals division. The purchase price was €225 million.

 For more information on this divestiture, see Note 3 to the Consolidated Financial Statements from page 216 onward

On October 31, 2022, BASF closed the divestiture of its Quincy, Florida site and corresponding attapulgite business to Clariant Corporation, Louisville, Kentucky. The Quincy site produces clay-based mineral products for a wide range of industrial applications. Until its sale, the site was part of the Dispersions & Resins division and employed around 75 people. The purchase price was \$60 million.

Agreed transactions

On July 19, 2022, BASF and ASC Investment Sarl, Luxembourg, signed an agreement on the sale of BASF's production site in De Meern, Netherlands, to ASC. The site produces nickel-based catalysts and is part of the Catalysts division. The transaction mainly covers production facilities, including the associated infrastructure and inventories, as well as the employees working at the site. The transaction is expected to close in the first quarter of 2023.

 For more information on this transaction, see Note 3 to the Consolidated Financial Statements from page 216 onward

Our Steering Concept

For us, creating long-term value as a company means generating earnings that consistently exceed the cost of capital employed. We encourage and support all employees in thinking and acting entrepreneurially. Both financial and nonfinancial aspects are an integral part of our value-based management. That is why we have established most important key performance indicators that cover both areas: return on capital employed (ROCE) and CO₂ emissions.

Our financial targets follow a steering concept that is aligned with our values. The return on capital employed (ROCE) is used as the key target and management indicator for the BASF Group. In line with our strategic targets, we aim to achieve a ROCE considerably above the cost of capital percentage every year. With ROCE, the same data is used for our value-based management, external communication with the capital markets and variable compensation. This means we use the same yardstick for internal management, employee incentivization and our shareholders' expectations.

As part of our corporate strategy, our target is to reduce our absolute greenhouse gas emissions by 25% by 2030. We aim to achieve net zero emissions (Scope 1 and Scope 2) by 2050. Consequently, CO₂ emissions are defined as a steering-relevant indicator, and we report on them as the most important nonfinancial key performance indicator.

Calculating ROCE and cost of capital

ROCE is calculated as the EBIT of the segments as a percentage of the average cost of capital basis.

To calculate the **EBIT of the segments**, we take the BASF Group's EBIT and deduct the EBIT of activities recognized under Other, which are not allocated to the divisions.

The **cost of capital basis** is calculated using the month-end figures and consists of the operating assets of the segments. These comprise the current and noncurrent asset items of the segments, including tangible and intangible fixed assets, integral investments accounted for using the equity method, inventories, trade accounts receivable, other receivables and other assets generated by core business activities and, where appropriate, the assets of disposal groups. The cost of capital basis also includes customer and supplier financing.

We have integrated the **cost of capital percentage** into our ROCE target as a comparative figure. This is determined using the weighted cost of capital from equity and borrowing costs (weighted average cost of capital, WACC). To calculate a pre-tax figure similar to EBIT, the cost of capital is adjusted using the projected tax rate for the BASF Group for the business year. In addition, the projected net expense of Other is already provided for by an adjustment to the cost of capital percentage. The cost of equity is ascertained using the capital asset pricing model. Borrowing costs are determined based on the financing costs of the BASF Group. The cost of capital percentage for 2023 is 9% (2022: 9%).

Calculation of CO₂ emissions

We calculate the BASF Group's absolute CO₂ emissions on the basis of greenhouse gas emissions, which are the sum of direct emissions from production processes and the generation of steam and electricity (Scope 1), as well as indirect emissions from the purchase of energy (Scope 2). Direct emissions from the generation of energy for third parties are not considered here. Relevant emissions include other greenhouse gases according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents.

 For more information on our CO₂ emissions and climate protection targets, see page 135 onward

Value-based management throughout the company

The target agreement process is an important part of our value-based management. It aligns individual employee targets with BASF's targets. The most important financial indicator in the operating business is ROCE. The other units' contribution to value is also assessed according to effectiveness and efficiency on the basis of quality and cost targets. To assess this, we use metrics such as BASF's internal service score in the service units.

For the BASF Group, we use EBIT before special items and capex (capital expenditure) as key performance indicators that have a direct impact on ROCE and as such, support its management.

- **EBIT before special items** is used to steer profitability at Group and segment level. This is calculated by adjusting the EBIT reported in the Consolidated Financial Statements for special items, making it especially suitable for assessing economic development over time. **Special items** arise from the integration of acquired businesses, from restructuring measures, certain impairments, gains or losses resulting from divestitures and sales of shareholdings, and other expenses and income that arise outside of ordinary business activities.
- **Capital expenditures** (capex) are used to manage capital employed in the BASF Group. These comprise additions to property, plant and equipment excluding additions from acquisitions, IT investments, restoration obligations and right-of-use assets arising from leases. Capex is not just relevant to ROCE management but also supports our long-term goal of increasing our dividend each year based on a strong free cash flow.

Furthermore, we comment on and forecast **sales** at Group and segment level in our financial reporting as a significant driver for EBIT before special items and thus ROCE.

 For more information on the development of these indicators, see page 56 onward



More and more electric vehicles are being registered worldwide. At the same time, the raw materials for their batteries are limited. That is why BASF teams are working on innovative processes to recycle lithium-ion batteries. This produces a substance known as "black mass" (see photo), from which high-purity lithium salt as well as nickel, cobalt and manganese can be recovered.

Material topics in focus:

Circular Economy and Resource Efficiency

GRI 3, 301, 304, 306

As the world's population grows, so does demand for limited natural resources. At the same time, many valuable materials end up in landfills or in waste incineration. New concepts are needed to decouple growth from resource consumption. Reduce, reuse and recycle are the keywords of this transition to a system of more sustainable product cycles with less resource consumption and lower carbon emissions.

The concept of conserving resources, recycling and feeding waste back into the system has been firmly anchored in our company since BASF was founded in 1865: At that time, Friedrich Engelhorn pursued the idea of producing synthetic dyes from coal tar – a waste product – and organizing production as efficiently as possible. We have stayed true to this tradition to this day and are aligning our actions with circularity more systematically than ever. For example, BASF's Verbund structure presents numerous opportunities for a circular economy: By intelligently networking our plants, we can use by-products from one plant elsewhere as feedstocks or energy, which reduces our overall resource consumption (see pages 135 and 142).

We want to further reduce our resource and carbon footprint, which is why we are aligning our feedstock base even more strongly with non-fossil alternatives such as bio-based or renewable raw materials. To expand our supply base, we are also developing additional waste-based sources of raw materials and suitable recycling processes, often with partners (see page 120). Our target here is to process 250,000 metric tons of recycled and waste-based raw materials – such as pyrolysis oil from mixed plastic waste or used tires – in our production plants annually from 2025.

Many of BASF's products and technologies are already helping to close loops at many points along the value chain. Together with our customers and other stakeholders, we want to further accelerate the transformation from linear to circular business models. Our

target: By 2030, we want to double our sales of solutions for the circular economy to €17 billion (baseline: 2020). These include:

– Products based on renewable or recycled raw materials:

These include products manufactured in whole or in part from renewable resources instead of fossil raw materials. The alternative raw materials are allocated to the end product using what is known as the mass balance approach. This is verified and certified by independent third parties (see box on page 121). We use this approach for selected ingredients for the cosmetics, detergent, cleaner and food industries, for example (see page 118). Other examples are products that contain mechanically recycled raw materials (Mycled) or products based on chemically recycled pyrolysis oil (Cycled products, see page 120).

– Products that close material cycles ("close the loop"): These

include products that enable and improve the recyclability of valuable resources. Our first focus area here is the value chain for plastics (see page 51). Examples include our certified compostable plastics ecoflex® and ecovio®, plastic additives for improved mechanical recycling, or catalysts and adsorbents for the purification and treatment of recycled raw materials. The second focus is recycling mineral raw materials. For example, together with partners we are driving forward innovative technologies and solutions for recovering metals such as lithium, nickel, cobalt and manganese from spent lithium-ion batteries (see page 120).

– **Products that increase the resource efficiency or lifespan of materials (“extend the loop”):** These include products that reduce resource consumption and environmental impact along the value chain. One example is Oxsilan®, an innovative thin-film technology for protecting metals from corrosion, for example before painting. The process not only enables higher productivity with lower material use, but also offers a favorable safety, health and environmental profile compared with conventional phosphating processes. This category also includes products that extend service life and/or reduce maintenance intervals. Tinuvin® light stabilizers are one example of this. They extend the lifespan of products such as agricultural films by providing reliable protection against UV radiation, heat and agrochemicals.

One of the steps we have taken to meet our targets and accelerate the transformation is establishing a company-wide Circular Economy Program. As part of this program, BASF teams are currently developing new approaches within three main action areas and over 45 initiatives: alternative raw materials pathways, innovative material cycles and new business models for the circular economy – which also include digital and service-based concepts. We also cooperate with partners along the value chain and are involved in numerous networks, such as the Ellen MacArthur Foundation, the World Business Council for Sustainable Development, the Global Battery Alliance and the Alliance to End Plastic Waste. Through this, we want to better understand needs, trends and growth opportunities, and contribute to the development of standards. One example is the mass balance concept, which we believe is key to the circular economy and the use of alternative raw materials in the chemical industry (see page 121).]

Good to know



Rethinking electromobility: the oli concept car

The oli [all-ë] co-creation project from Citroën and BASF shows how electric vehicles can save weight and conserve resources through elimination, reduction and the use of innovative materials. Teams from both companies worked together to put various components and materials into new contexts for the concept car, which was unveiled in September 2022. Many of the components are designed and manufactured from materials from the same chemical product family. This makes them easier to recycle at the end of their useful life.

For example, the complete backrest is made of Ultrasint®, a flexible 3D-printed plastic material from BASF. The open lattice structure also provides natural air flow, replacing all ventilators in the seat. Engineering plastics from BASF replace conventional materials such as metal in many other parts of the vehicle interior and exterior, which significantly reduces weight while opening up a wide range of design options. The accelerator and brake pedals are made of Ultramid®, for example. The center console is made of Elastollan®. BASF also offers both materials based on renewable

and recycled raw materials. The hood, roof, and trunk are made of panels combining the Elastoflex® polyurethane system and the Elastocoat® spray paint system. The panels are lightweight and extremely stable thanks to a honeycomb sandwich structure.

The car body was coated using R-M® AGILIS®, a water-based coating with a very low content of volatile organic compounds (VOCs). BASF CathoGuard® 800 protects the battery housing from corrosion. The electrocoating enables resource-efficient processes and stands out for its eco-friendliness: It is tin/HAPs-free with low solvent content.

Capping the top speed at 110 km/h (68 mph) and limiting acceleration significantly improves oli's range and battery lifespan.

Discover the oli concept car at concept-car-citroen.basf.com

「Our Sustainability Concept」

GRI 2, 3, 203, 304, 413, 415, 416

We implement our corporate purpose – We create chemistry for a sustainable future – by systematically incorporating sustainability into our strategy, our business, and our assessment, steering and compensation systems. We secure our long-term success with products, solutions and technologies that create value added for the environment, society and the economy.

Our strategic approach

At a glance

- Sustainability aspects integrated into corporate steering
- Targets for climate protection, circular economy, procurement, safety and employees
- Strategic guidelines on stakeholder management and our societal engagement
- Chief Human Rights Officer appointed to further embed human rights aspects in decision-making processes

Sustainability is at the core of what we do and a driver for growth and value. Analyzing our contributions to sustainability also enables us to manage risks effectively. We pursue a holistic sustainability approach that covers the entire value chain – from our suppliers and our own activities to our customers. We have formulated commitments for our conduct along the value chain and underpinned these with corresponding targets and measures (see page 36).

Based on our corporate strategy, we steer the global **sustainability target** for climate protection via the most important key performance indicator (KPI) "absolute CO₂ emissions"¹ (see page 35). To this end, we have established the necessary steering mechanisms and control systems at Group level, for example, by intensifying training and providing further support for decentralized implementation. Our

activities to reduce greenhouse gas emissions include using renewable energies for both electricity and steam production, developing and applying new low-carbon production processes, using renewable raw materials, and ongoing measures to further increase energy and resource efficiency in our production (see page 135). We have also set up a project organization to achieve our climate protection targets. The Net Zero Accelerator unit concentrates on implementing and accelerating projects on low-carbon production technologies, the circular economy and renewable energies.

In addition to this climate protection target, we have set further sustainability targets, for example, on responsible procurement, resource-efficient and safe production, engaged employees and diversity.

We want to offer our customers innovative products and solutions that support their sustainability goals. That is why we ensure that the business units continuously monitor and evaluate relevant sustainability aspects. These evaluations are taken into account in strategies, in the implementation of research projects and in innovation processes, among other things.

A significant steering tool for the product portfolio, based on the sustainability performance of our products, is the **Sustainable Solution Steering** method. This rates our products' applications in the relevant markets and customer industries. If, during reassessment of our portfolio, we identify products with significant sustainability

concerns, we classify these as "challenged." We develop and systematically implement action plans for all products in this category. These include research projects and reformulations to optimize products, or even replacing the product with an alternative. To rigorously align our portfolio with contributions to sustainability, in 2018 we started phasing out all Challenged products within five years of their initial classification as "challenged" at the latest. A particular focus in the continued development of our product portfolio is on products that make a substantial sustainability contribution in the value chain. These include products that make positive contributions to areas such as health and safety, reducing emissions and the circular economy.

Our target of generating €22 billion in Accelerator sales by 2025, which was based on our corporate strategy, was already achieved in 2021 with sales of €24.1 billion. In order to address the growing sustainability requirements in our markets with innovative solutions, we want to align our product portfolio even more strongly with climate protection, climate neutrality and the circular economy going forward. That is why we are updating our methodology and our product portfolio steering target and will introduce a revised method in 2023.

As a co-founder of the U.N. Global Compact, we contribute to the implementation of the United Nations' (U.N.) Agenda 2030. Our products, solutions and technologies help to achieve the U.N. **Sustainable Development Goals (SDGs)**, especially SDG 2 (Zero

¹ The target includes Scope 1 and Scope 2 emissions. Other greenhouse gases are converted into CO₂ equivalents in accordance with the Greenhouse Gas Protocol.

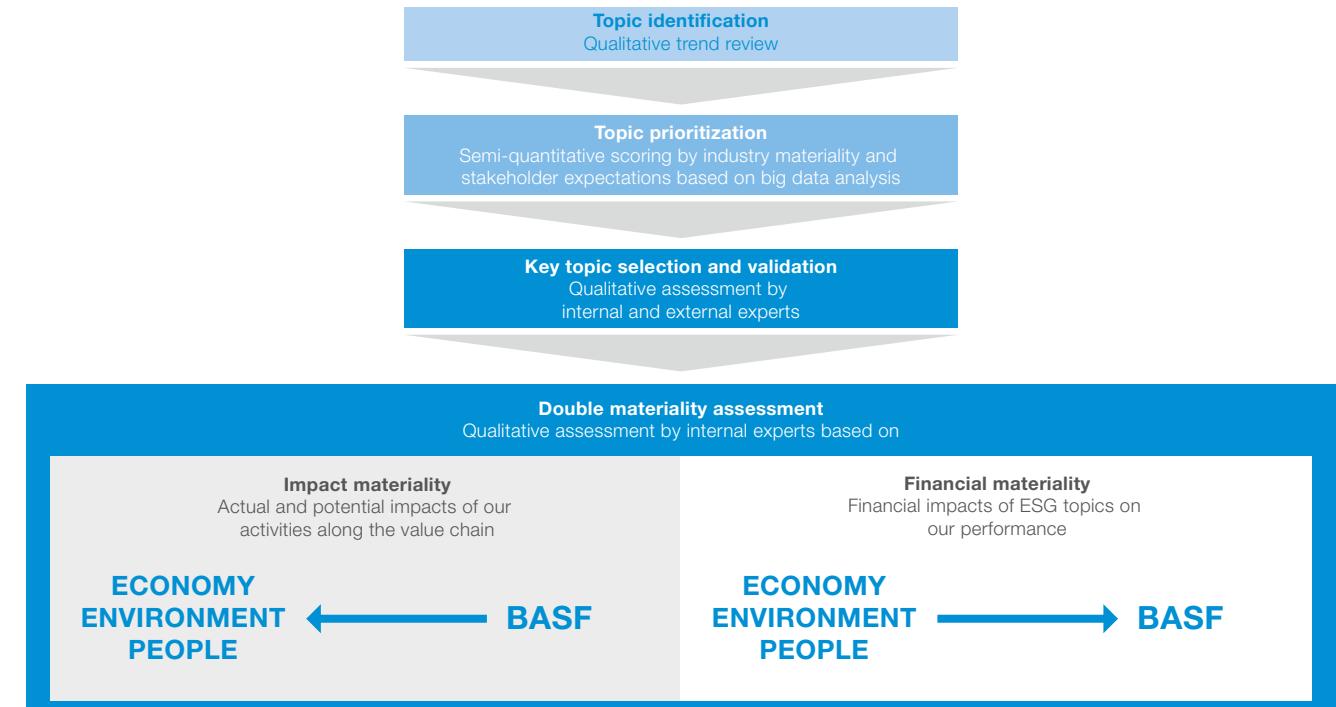
hunger), SDG 5 (Gender equality), SDG 6 (Clean water and sanitation), SDG 7 (Affordable and clean energy), SDG 8 (Decent work and economic growth), SDG 12 (Responsible consumption and production) and SDG 13 (Climate action). To prioritize the SDGs relevant to BASF, in 2022 internal experts again assessed the impacts and positive contributions of our products, our corporate targets and strategic action areas.

In 2022, we carried out an improved **materiality analysis** that already focuses on the double materiality required by future regulations. This identified both sustainability topics on which we have a potentially positive or negative impact through our business activities along the value chain, and those topics that have or could have a positive or negative impact on the company's performance. The graphic on this page illustrates our approach and the dimensions of double materiality.

In the first step, external developments and data were evaluated in order to prioritize topics. These included competitor and customer activities, relevant standards and regulations, and other trends relating to sustainability. The 48 topics identified in this step were then evaluated based on their importance for the chemical industry and the requirements and expectations of our stakeholders (such as customers, suppliers, competitors, investors and NGOs) using big data tools and further prioritized as the next step.

The core topics identified were then assessed in terms of their double materiality for BASF. Each sustainability aspect was considered from two perspectives: To assess sustainability relevance ("impact materiality"), both the actual and the potential positive and negative impacts of our company's activities were considered along three stages of the value chain (upstream, own operations, downstream). Here, we assessed the scale of impact, its scope and likelihood of occurrence. The individual topics were classified based on their potential financial impacts on BASF as part of the financial materiality analysis. Specifically, we analyzed how each sustainability aspect affects us geographically, for example, whether a local business unit or entire regions are affected, whether it impacts our production, our employees, meeting the targets we have set for the

Identifying and assessing sustainability topics^a



^a Material within the meaning of section 289c HGB or relevant within the meaning of the Global Reporting Initiative

BASF Group, or our reputation. The results help us to better understand the complex and sometimes diverging requirements and expectations that our stakeholders have of us and to define strategically relevant topics for our long-term business success.

A sustainability aspect is considered material in the sense of double materiality if it has been classified as material both at the level of sustainability relevance and at the level of financial relevance. Under the Global Reporting Initiative, a sustainability aspect is additionally already considered material if it has only been classified as material at the level of sustainability relevance. On this basis, the following 12 topics were identified as material and confirmed by the Corporate Sustainability Board: waste, climate change adaptation, biodiversity,

business ethics, occupational health & safety, climate change mitigation, circularity and resource efficiency, plastic waste, human rights and labor rights, product stewardship, diversity, inclusion & equal work, and water & wastewater.

For more information on our materiality analysis, see bASF.com/materiality

Our organizational and management structures

We are constantly working to broaden our contributions to key sustainability topics and to reduce the negative impact of our business activities. Together with decentrally organized specialists, the Corporate Strategy & Sustainability unit in the Corporate Center is responsible for **integrating sustainability** into core business activities and decision-making processes. The unit is also responsible for the global steering of climate-related matters. Since January 2022, the **Net Zero Accelerator** unit has been driving forward new and existing projects, focusing on further acceleration and implementation to achieve CO₂ reduction targets worldwide. Both units report to the Chairman of the Board of Executive Directors.

The Board of Executive Directors and the Supervisory Board are regularly briefed on the development of individual sustainability topics. The Board of Executive Directors incorporates the results and recommendations from sustainability evaluations of business processes into its decisions, for example, on proposed investments and acquisitions. It makes decisions with strategic relevance for the Group and monitors the implementation of strategic plans and target achievement. The global climate protection target is linked to the compensation of the entire Board of Executive Directors and senior executives via the most important KPI "absolute CO₂ emissions." The Corporate Sustainability Board, which is composed of heads of business and Corporate Center units and regions, supports the Board of Executive Directors on sustainability topics and discusses operational matters. It is chaired by Board of Executive Directors member Saori Dubourg.

In 2022, BASF appointed a **Chief Human Rights Officer** to further embed human rights aspects in decision-making processes. He reports directly to the Chairman of the Board of Executive Directors (see page 109).

We **systematically evaluate sustainability criteria**, including the effects of climate change, as an integral part of decisions on acquisitions and investments in property, plant and equipment or financial assets. In this way, we not only assess economic dimensions, but also the potential impacts on areas such as the environment, human rights or the local community. We evaluate both the potential impacts of our activities here as well as which effects we are exposed to.

If we identify potential negative impacts or previously untapped opportunities to make a greater contribution, for example in planned investments, these are presented transparently in the internal decision-making process and possible mitigation measures, such as changes in water management, are proposed.

In our Sustainable Finance Roundtable, we discuss topics relating to sustainable finance. Here, experts from departments such as Finance, Corporate Strategy, and Investor Relations and Communications discuss new legal or capital market-driven requirements. The interdisciplinary group analyzes the steadily growing requirements, assesses the impacts on BASF and drives forward the necessary change processes as well as the concrete implementation of measures.

 For more information on our financial and sustainability targets, see pages [35](#) and [36](#)

 For more information on our risk management, see pages [157](#) to [167](#)

 For more information on the organization of our sustainability management, see [basf.com/sustainabilitymanagement](#)

 For more information on compensation structures, see the compensation report at [basf.com/compensationreport](#)

Measuring sustainable value added

We are aware that our business activities can have both positive and negative impacts on the environment and society. We aim to increase our positive contributions and minimize the negative impacts of our business activities. To achieve this, we need to measure how our actions and our products impact the environment and society.

We already have many years of experience in this area from evaluating our products and processes using methods such as Eco-Efficiency Analyses, the SEEbalance® Socio-Eco-Efficiency Analysis, our Sustainable Solution Steering portfolio analysis, BASF's corporate carbon footprint or the calculation of Product Carbon Footprints.

Our stakeholder management

Our stakeholders include customers, employees, investors, suppliers, the communities surrounding our sites, and representatives from industry, academia, politics and society. Parts of our business activities, such as the use of certain new technologies or our environmental impacts, are often viewed by stakeholders with a critical eye. We take these questions seriously, initiate dialogs and participate in discussions. We are in **ongoing exchange** with our stakeholders through a variety of formats. This helps us to even better understand what matters to groups of society, what they expect of us and which measures we can pursue in order to establish and maintain trust, build partnerships, and increase societal acceptance for and the sustainability of our business activities. For important topics, we systematically identify key stakeholders at an early stage to discuss critical questions with them. Relevant considerations here include their topic-specific expertise and willingness to engage in constructive dialog.

We already established an external, independent Stakeholder Advisory Council (SAC) in 2013 and the Human Rights Advisory Council (HRAC) in 2020. In the SAC, which is led by the Chairman of the Board of Executive Directors, international experts from academia and society contribute their perspectives to discussions with BASF's Board of Executive Directors. Focus topics in 2022 were climate protection and the energy transformation, as well as the significance and aspects of the societal dimension of sustainable development. The HRAC is an advisory body comprising external human rights specialists and internal experts. It helps us critically reflect on our positions and address potential for improvement.

We have a particular responsibility toward our sites' neighbors. We promote open exchange between residents and our site management and strengthen trust in our activities with established **community advisory panels**. Our globally binding requirements for community advisory panels are based on the grievance mechanism standards in the United Nations' Guiding Principles on Business and Human Rights. We keep track of their implementation through the existing global database of the Responsible Care Management System.

Our **political advocacy** is conducted in accordance with transparent guidelines and our publicly stated positions. The same applies to our activities in associations. Our Industry Associations Review compares the energy and climate protection positions of BASF and the most important associations of which we are a member, with explanations on our approach.

BASF does not financially support political parties, for example, through donations in cash or in kind. This is codified in a global guideline. In the United States, employees at BASF Corporation have exercised their right to establish a Political Action Committee (PAC). The BASF Corporation Employee PAC is an independent,

Stakeholder demands and expectations of BASF



Customers

- Innovative and sustainable solutions
- Reliable partner
- Attractive prices



Society: politics, NGOs, media

- Responsible and trustworthy partner
- Production of safe products in compliance with environmental and social standards
- Jobs and taxes



Community

- Safe, disruption-free operations
- Attractive jobs
- Support for local communities



Investors

- Attractive dividend yield
- Transparency and risk minimization
- Strong long-term share performance



Suppliers

- Fair and reliable business relationships
- Support in complying with our Supplier Code of Conduct (environmental and social requirements)



Employees and management

- Attractive and fair employer
- Health protection
- Opportunities for professional development

federally registered employee association founded in 1998. It collects donations from employees for political purposes and independently decides how these are used, in accordance with U.S. law.

For more information on dialog with stakeholder groups, see page 113

For more information on our guidelines for responsible lobbying, see basf.com/guidelines_political_communication

For more information on the Industry Associations Review, see basf.com/corporategovernance

For more information on the Human Rights Advisory Council, see basf.com/human-rights-council

For more information on the Stakeholder Advisory Council, see basf.com/en/stakeholder-advisory-council

For more information on our stakeholder activities, see basf.com/stakeholder-engagement

Our societal engagement approach

Our societal engagement is an important part of the implementation of our sustainability strategy and our corporate social responsibility. Our activities are bundled in three action areas globally across all levels of the BASF Group. We want to improve people's quality of life by preventing and combating disease (health), promoting educational equality, employability and economic participation (skills), and conserving natural resources (resources). We want to foster societal cohesion with our portfolio and our competencies. In accordance with our societal engagement policy, our actions are in line with our compliance policy, BASF's strategy and our sustainability commitments.

For more information on our societal engagement, see page 112

Innovation

Innovations based on chemistry play a pivotal role in overcoming the greatest challenges of our time. Our activities are aimed at developing new products, entering new markets and further increasing our productivity. That is why we are working together with our customers on innovative processes, technologies and products for a sustainable future.

At a glance

€2.3 billion

Research and development expenses

~1,000

New patents filed

- Close cooperation between research and business units
- Innovation focus on developing sustainable products and processes for our customers
- Close cooperation with universities, research institutes and companies

Innovation has always been the key to BASF's success. The knowledge and skills of our highly qualified employees is our most valuable resource here and the source of our innovative strength. We had approximately 10,000 employees involved in research and development worldwide in 2022.

Our **research and development expenses** amounted to €2,298 million in 2022 (2021: €2,216 million). Research and development activities in our operating divisions, which is mainly application and customer-related, accounted for 83% of this figure. Corporate research, in which we bundle cross-divisional and long-term topics, was responsible for 17% of these expenses.

Our **innovation focus** is on developing new products and solutions that help our customers achieve their sustainability goals. By helping them reduce their carbon footprint, use resources more efficiently, or manufacture products in a more environmentally friendly way and recycle them, we ensure our long-term competitiveness and at the

same time, play a role in decoupling growth from the consumption of limited resources.

In 2022, we generated sales of around €12 billion with products launched on the market in the past five years that stemmed from research and development activities. In the long term, we aim to further increase sales and earnings with new and improved products – especially with products that make a substantial sustainability contribution in the value chain (see page 45).

We **reorganized our global research activities in 2022** to further strengthen our innovation performance and respond to our customers' industry-specific requirements even better and more quickly. Business and application-driven units that were previously part of the research divisions were integrated into the operating divisions, aligning them even more closely with the needs of our customers. This further shortens the time to market for new products and accelerates BASF's growth.

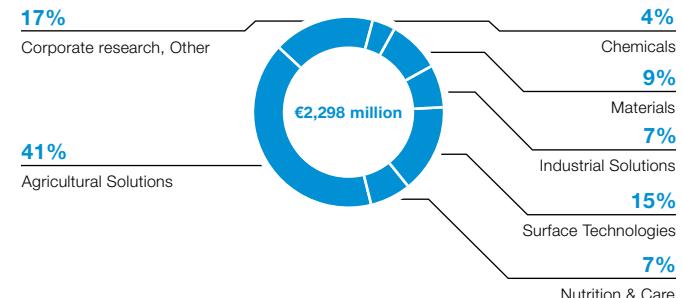
We have bundled research activities relevant to several divisions – such as chemical synthesis, process development, biotechnology, catalysis, analytics and digitalization – in a **central research division, Group Research**.

This new research division supports all operating divisions and drives forward projects that address major sustainability topics like reducing emissions from chemical processes and products, energy efficiency or recycling technologies.

The unit is globally positioned with research centers in Europe, North America and Asia Pacific. Together with the research and

development units in our operating divisions, Group Research forms the core of our global Know-How Verbund.

Research and development expenses by segment 2022



We continue to use corporate funding to finance research of broad relevance to the BASF Group that goes beyond the industry-specific focus of the individual operating divisions. We strengthen existing research focus areas and develop new technologies that are of central significance for our business units and their customers, such as digital tools, polymer technologies, catalyst processes or biotechnological methods.

We promote creative research approaches and drive forward the development of new business areas. For example, we are developing innovative coating technologies and materials that make innovative surfaces and functions possible. Functional films can be used to reduce the frictional resistance of surfaces or improve UV protection and weather resistance, for example.

As part of our Carbon Management R&D Program, we are carrying out intensive research into pioneering, low-carbon production processes for basic chemicals such as hydrogen (see page 141). This will enable us to offer our customers products with a lower carbon footprint in the future.

Employees in research and development

~10,000

Our **global research and development presence** – and its effectiveness – is vital to our long-term success. This enables us to respond to the needs and requirements of the regional markets in a differentiated way, establish new customer relationships and leverage growth potential. Scientific collaborations give us access to talent, strengthen our Research and Development Verbund and make BASF an even more attractive partner and employer.

The largest and most important site in our research network is Ludwigshafen in Germany. Investments there include a combined laboratory building for cleanroom and elemental analysis. The new building's modern digitalization and automation solutions set new standards in safety and efficiency. The state-of-the-art laboratory building took three years to build and was put into operation in October 2022. In addition, we will build a new Catalyst Development and Solids Processing Center in Ludwigshafen, Germany, by 2024 to bring process innovations and new chemical catalysts to market faster.

We want to continue advancing our research and development activities, especially in Asia. For instance, we completed the third expansion phase for the BASF Innovation Campus in Shanghai, China, at the end of 2022, with new laboratories for advanced materials and systems as well as for chemical engineering.

The number and quality of our **patents** also attest to our power of innovation and long-term competitiveness. In 2022, we filed 1,013 new patents worldwide, of which 39.2% were for innovations with a particular focus on sustainability. The Patent Asset Index, a method that compares patent portfolios, once again ranked us among the leading companies in the chemical industry in 2022.

 For more information on innovation, see bASF.com/innovations

Global network

Our global network of top universities, research institutes and companies forms an important part of our Know-How Verbund. It gives us direct access to external scientific expertise, talented minds from various disciplines as well as new technologies. Our academic research alliances bundle partnerships with several research groups in a region or with a specific research focus.

The Northeast Research Alliance (NORA) and the California Research Alliance (CARA) are located in the **United States**. NORA focuses on materials science and biosciences, catalysis research, digitalization and cooperation with startups.

Academic Research Alliances

Access to scientific expertise, talented minds and new technologies

Teams at the interdisciplinary CARA research center are working on new functional materials, formulations, digital methods, catalysis, chemical synthesis, and in engineering sciences and biosciences.

The Joint Research Network on Advanced Materials and Systems (JONAS) is active in **Europe** and concentrates on supramolecular chemistry, polymer chemistry and sustainable technologies. We are working on innovative components and materials for electrochemical energy storage with the Karlsruhe Institute of Technology (KIT) at the Battery and Electrochemistry Laboratory (BELLA). At the joint Catalysis Research Laboratory (CaRLa), BASF is researching homogeneous catalysis in cooperation with the University of Heidelberg. BasCat is a joint laboratory operated by the UniCat cluster of excellence and BASF at the Technical University of Berlin, where new heterogeneous catalysis concepts are being explored together with the Fritz Haber Institute of the Max Planck Society, also based in Berlin. The iL (Innovation Lab) in Heidelberg, Germany, focuses on functional printing, printed sensors and IoT (internet of things) applications. Our most important partner in the U.K. is Imperial College London with thematic clusters in chemical engineering (flow chemistry) and digitalization (crystallization, corrosion).

At the Network for Asian Open Research (NAO) in the **Asia Pacific** region, research focuses on polymer and colloid chemistry, catalysis, machine learning and smart manufacturing. The Academic Research Alliances are complemented by cooperative partnerships with around 220 universities and research institutes as well as collaborations with a large number of companies.
 For more information on our collaboration initiatives, see bASF.com/innovate-with-us



Mixed plastic waste is very difficult or impossible to recycle mechanically. As part of the ChemCycling™ project, BASF is working with partners on innovative recycling technologies and their implementation on a commercial scale to enable these resources to be fed back into the system in the future, too.



Material topics in focus:

Plastic Waste

GRI 3

Plastics are part of modern life. Whether in clothing or shoes, in mattresses or furniture, in smartphones or cars, in medicine or construction – they are used in almost all areas of life because of their beneficial properties. But plastics also come with challenges: Only 20% of the approximately 250 million metric tons of plastic waste generated worldwide each year is currently recycled. At BASF, we are working to increase this number.

Plastics are an important part of our product portfolio. This includes engineering plastics, polyurethanes, biopolymers and styrene foams. Our products are mostly used in durable and demanding applications, such as automotive engineering, medical technology, electronics and electrical engineering, and building insulation.

As a responsible player in the value chain, we want to further improve the sustainability performance of plastics throughout the entire life cycle – from the production and use of renewable and recycled raw materials (see page 43) through the use phase, where innovative plastic materials ensure greater sustainability in areas such as mobility, construction or energy, to the handing of plastics at the end of their life.

For many years, we have been conducting research into soil-bio-degradable and compostable plastics and their biodegradability in different environments. With ecoflex® and ecovio®, BASF has two certified bioplastics on the market that can biodegrade under the conditions in the recognized standards according to which they are certified.

At the same time, we are developing solutions for improved mechanical recycling. These include additives that extend the use phase of plastics and help address quality problems of recyclates. The use of BASF stabilizers also makes it possible to keep plastics in circulation not just for one cycle, but for several. Technical solutions from BASF, such as NIR spectroscopy or sustainable

cleaning solutions, help to separate and then process different types of plastics.

Since not all waste streams are suitable for mechanical recycling, BASF is also driving forward the chemical recycling of plastics as a complementary technology. In this process, plastics are broken down into their building blocks using various methods, which can then be used again in production as recycled feedstocks (see page 120).

We are involved in numerous initiatives to advance new ideas together with partners. For example, BASF is a founding member of the Alliance to End Plastic Waste (AEPW), which is active in four focus areas: developing infrastructure for waste collection, promoting innovative recycling methods, education and engagement of various stakeholders, and cleanup of areas heavily impacted by plastic waste. The initiative aims to invest up to \$1.5 billion by 2023. Further examples of our commitment to greater sustainability in the plastics value chain include the World Plastics Council, Operation Clean Sweep and the Ellen MacArthur Foundation.

For more information on plastics, see plasticsjourney.bASF.com

For more information on the AEPW, see endplasticwaste.org

For more information on the World Plastics Council, see worldplasticscouncil.org

For more information on Operation Clean Sweep, see opcleansweep.org

For more information on the Ellen MacArthur Foundation, see ellenmacarthurfoundation.org

The BASF Group's Business Year

GRI 201

Economic Environment¹

Global economic growth in 2022 was impacted by the outbreak of the war in Ukraine and rising inflation and interest rates worldwide. Increasing energy and raw materials prices made many products more expensive and damped consumers' purchasing power. European chemical production fell sharply due to drastic increases in regional gas prices.

 For the outlook on the economic environment in 2023, see page 151 onward

In this section:
 Economic Environment
 Results of Operations
 Net Assets
 Financial Position
 Actual Development Compared With Outlook for 2022
 Business Review by Segment
 Other
 Non-Integral Oil and Gas Business
 Regional Results
 E.U. Taxonomy

At a glance

+3.0%
Global GDP growth

+2.2%
Increase in global chemical production

- Energy price shock and drop in chemical production in Europe
- High interest rates and weak economic data in the United States
- Volatile economic development in Asia
- Drastic increase in European gas prices and rising oil price

Global gross domestic product (GDP) grew by 3.0% compared with the previous year (2021: +6.1%). Global industrial production added 2.5% (2021: +6.2%), while global chemical production expanded by only 2.2% (2021: +6.1%). The average price for a barrel of Brent crude oil increased to \$101 per barrel (2021: \$71 per barrel). Gas prices in Europe averaged €124.16 per MWh (\$38.01 per mmBtu) for the year, more than double the prior-year level and more than ten times the 2020 level.

Trends in the global economy in 2022

Global economic development in the course of 2022 was exceptionally volatile and characterized by strong regional differences. Macroeconomic developments were driven by a number of key, overlapping factors: the outbreak of the war in Ukraine, the recovery from the coronavirus pandemic in the advanced economies, China's long commitment to a zero-COVID policy and the repercussions of the strong fiscal stimuli in previous years. The spike in energy prices, especially natural gas prices in Europe and prices on the international LNG markets, significantly impacted the development of industrial activity. Overall demand was also damped by the sharp rise in inflation rates and rising interest rates in almost all countries (with the exception of China and Japan). The upturn in inflation rates was mainly driven by higher energy prices, with bottlenecks on the labor and goods markets also playing a role. The strong U.S. dollar drove up inflation in all countries that imported goods and raw materials from the dollar area.

Despite the crises and the weak growth momentum in the course of 2022, many countries still reported comparatively high annual growth rates in their statistics.

The global economy fluctuated over the course of 2022 and saw significant regional differences. Gross domestic product in the European Union initially increased significantly, while the United States started the year with a technical recession. This reversed in the second half of the year. The European economies grew only weakly, and macroeconomic activity in the United States accelerated slightly. In the emerging markets of Asia, economic development was volatile throughout the year. This was mainly driven by gross domestic product in China: A solid start to the year was followed by a decline in the second quarter, and, after a renewed recovery in the third quarter, there were again strong braking effects toward the end of the year.

¹ All information relating to past years in this section can deviate from the previous year's report due to statistical revisions. Where available, calendar-adjusted macroeconomic growth rates are reported. Figures for 2022 not yet available in full are estimated.

Gross domestic product

Real change compared with previous year

	2022	2021
World	3.0%	6.1%
European Union	3.6%	5.3%
United States	2.1%	5.9%
Emerging markets of Asia excluding China ¹	5.5%	6.3%
China	3.0%	8.4%
Japan	1.2%	2.2%
South America	3.7%	7.7%

In the **United Kingdom**, sharp increases in the cost of living damped private consumption. Industrial production declined in the course of the year and investment was impacted by the sharp rise in interest rates. Thanks to a dynamic recovery in the services sector, the economy nevertheless grew by 4.1% (2021: +7.6%).

Developments in **Russia** were strongly influenced by the international sanctions imposed as a result of the Russian attack on Ukraine. GDP sank by an estimated 3.1% in 2022. Negative economic effects in the wake of the trade and financial sanctions imposed by the United States and the E.U. were partly offset by rising raw materials prices and the substitution of goods imports by domestic production.

Recurring waves of coronavirus infections also impacted growth in **Japan** (+1.2%) and **South Korea** (+2.6%). Industrial production was also depressed by supply problems in the automotive and electronics industries and weaker foreign demand.

In **South America**, growth picked up in the first half of the year, supported by high raw materials prices and catch-up effects in private demand. Private consumption in **Brazil** was also boosted by government transfers and tax cuts ahead of the presidential elections. In **Argentina**, private consumption also continued to grow strongly despite high inflation and interest rates. However, economic activity in the region weakened significantly in the second half of the year. Overall, South America's GDP grew by 3.7% (2021: +7.7%).

Economic trends by region

In the **European Union (E.U.)**, GDP grew by 3.6% in 2022 (2021: +5.3%). In the first half of the year, the catch-up effects of the coronavirus pandemic had a positive impact on the services sector and on traditional vacation countries. GDP rose by 3.9% and 5.5% in Italy and Spain, respectively, and by 2.7% even in France. In Germany, by contrast, GDP increased by only 1.9%. German industrial production was down slightly overall. In the energy-intensive industries, production actually declined significantly due to the drastic rise in energy prices. Due to high service imports from foreign tourism and weaker growth in demand for goods from abroad, net exports did not contribute to growth. Investment also remained weak. By contrast, private consumption grew by more than 4%. This was mainly due to catch-up effects in the services sector. However, consumer and business sentiment became increasingly clouded by rising energy prices and economic uncertainty resulting from the war in Ukraine.

The **Eastern E.U. countries** recorded comparatively strong growth of over 4% (2021: +6.1%). However, economic activity slowed considerably in the course of the year as a result of weaker export and consumer demand and double-digit inflation rates.

In the **United States**, GDP fell in the first two quarters of 2022 compared with the second half of 2021. Goods consumption and housing investment declined. Foreign trade also had a strong negative impact on growth in the first quarter. By contrast, services consumption made a consistently positive contribution. The U.S. economy picked up in the second half of the year, mainly due to a stronger foreign trade surplus and solid private consumption. Overall, the U.S. economy grew by 2.1% in 2022 (2021: +5.9%).

Economic developments in the **emerging markets of Asia** were mixed. In **China**, growth was repeatedly weighed down by restrictions under the government's zero-COVID strategy. A positive first quarter of 2022 was followed by a drop in GDP in the second quarter as a result of lockdowns in many Chinese cities. By contrast, the third quarter saw a dynamic recovery. In the fourth quarter, rising infection rates and the abrupt change of course in the zero-COVID policy again led to a weaker economic performance. Overall, GDP growth in China remained well below its medium-term growth path at 3.0%. The weak economy and ongoing travel restrictions in China also dampened growth in many other countries in the region, which have close trade relations with China. Nonetheless, the other emerging Asian economies achieved overall growth of 5.5%.

Trends in key customer industries

Disruptions in global supply chains gradually eased in 2022. However, due to the zero-COVID policy in China and the lockdowns there in the second quarter of 2022, supply bottlenecks remained in global supply chains, for example, in the automotive and electronics industries. At the same time, demand for consumer durables in particular weakened over the course of the year. Industries such as furniture had seen frontloading effects here in recent years due to the coronavirus pandemic. In addition, declining purchasing power caused by inflation reduced demand from end consumers. In the construction sector, the continued dynamic upturn in construction costs and rising interest rates had a negative impact.

Global industrial production expanded by only 2.5% overall in 2022 (2021: +6.2%). At 0.9%, growth in the advanced economies was significantly weaker than in the emerging markets, which recorded growth of 3.8%. Despite the generally subdued economic environment in Asia, more than 60% of the growth in global industrial value added was generated there. Over 40% of growth came from China in 2022. Industrial growth was 3.2% in Asia as a whole and 3.8% in the emerging Asian economies. In the E.U., by contrast,

¹ We define the emerging markets of Asia as the ASEAN countries (Brunei, Indonesia, Malaysia, Myanmar, Cambodia, Laos, the Philippines, Singapore, Thailand, Vietnam), India, Pakistan and Bangladesh.

industrial growth was slightly lower than the global average at 2.0% (2021: +7.0%) and in North America, it was even considerably lower at 1.2% (2021: +2.1%), mainly due to the weak construction sector.

Growth in key customer industries

Real change compared with previous year

	2022	2021
Industry total	2.5%	6.2%
Transportation	5.7%	3.8%
Of which: automotive industry	6.2%	3.5%
Energy and resources	3.7%	3.6%
Construction	2.2%	2.4%
Consumer goods	3.1%	8.8%
Electronics	5.9%	12.4%
Health and nutrition	2.3%	5.9%
Agriculture	2.3%	3.5%

Global **automotive production** was still impacted by supply bottlenecks for semiconductors in 2022. Overall, however, automotive production grew by around 4.8 million in 2022 to 82 million (+6.2%) manufactured passenger cars and light commercial vehicles. All markets grew except Eastern Europe (around 700,000 fewer vehicles produced). The strongest volume growth came from Asia. The world's largest vehicle market added 3.3 million vehicles, an increase of 7.7%. Of this figure, China accounted for around 1.5 million vehicles and India for over 900,000. In China, sales were boosted by a reduction in sales tax. Almost 700,000 more vehicles (+5.7%) were produced in the E.U. and around 1.3 million more (+9.7%) in North America than in the previous year. In South America, the increase was around 200,000 vehicles (+8.5%). Around 75% of the total market growth of 4.8 million vehicles was attributable to purely battery-electric vehicles. Consequently, electric vehicles' share of all vehicles produced rose from around 6% in 2021 to around 10%.

Production in the **construction industry** was impacted by rising interest rates and construction costs. At 2.2%, overall growth was weaker than in the previous year (+2.4%). The infrastructure segment

grew significantly faster than residential construction and other building construction. In China, investment in residential construction declined, while infrastructure investment again posted considerable growth. In the E.U., by contrast, residential construction activity was still comparatively strong, although demand began to cool in the course of the year due to rising interest rates. In the United States, all construction segments declined as a result of high interest rates and restricted public budgets.

Consumer goods production grew by 3.1%, much slower than in the previous year (+8.8%). Demand weakened for consumer durables in particular. Production in the furniture and textile industries declined after having grown by more than 8% and around 5%, respectively, in the previous year. Production of chemicals used to manufacture care products grew at about the same rate as global GDP.

Growth in the **electronics industry** also weakened significantly (2022: 5.9%, 2021: 12.4%). In electronic components, computers and peripherals, communications electronics and consumer electronics, growth declined sharply compared with 2021. Double-digit growth rates were recorded in all segments in the previous year.

Production in the **energy and raw materials** sector increased by around 3.7% in 2022, slightly more than GDP. Weaker growth in Russia was offset by stronger production in the Middle East and the United States. Oil and gas production again saw strong growth after stagnating in 2021, while the production of other raw materials grew at a slightly slower rate than in the previous year.

Growth in **health and nutrition** was considerably weaker, declining from 5.9% to 2.3% in 2022. At 1.9%, production in the food industry grew at a slightly slower rate than the longer-term average and was significantly weaker than in the previous year, which was characterized by catch-up effects. In the pharmaceutical industry, growth fell sharply after the 2021 vaccine boom (+12.9%) but was still positive at 1.9%.

Agricultural production declined from 3.5% in the previous year to 2.3% in 2022. The slowdown was mainly due to the war in Ukraine and a long dry spell in some regions over the summer. As a result of the war, production in Ukraine fell by an estimated 35% and by 4.5% in Eastern Europe as a whole. Production also declined slightly in Western Europe and in the Americas. In Asia, by contrast, agricultural production grew by 3.7%.

Trends in the chemical industry

Global growth in the chemical industry lagged behind the industry as a whole in 2022 and at 2.2%, was significantly weaker than in the previous year (+6.1%). In the E.U., production fell considerably by 5.8% due to the sharp rise in natural gas prices. In Germany, this even dropped by around 12% as a result of shutdowns in the production of gas-intensive basic chemicals. The United Kingdom also saw a strong decrease in chemical production.

By contrast, chemical production in the United States increased by 2.3%. However, base effects due to weather-related production losses in 2021 played a major role here (2021: +1.7%). In South America, production grew by 2.6%, slightly slower than in the previous year (+3.6%).

Chemical production in Asia expanded by 4.2% overall. However, this varied widely by country. In China, the world's largest chemical market, production grew by a very volatile 6.6% overall. Production also increased significantly in India (+4.6%). By contrast, in Japan, South Korea and Taiwan, production fell by 3.0%, 7.4% and 12.9%, respectively.

Chemical production in the Middle East increased by 4.0%, slower than in 2021. Growth was stronger in Saudi Arabia and the United Arab Emirates but declined significantly in Iran and especially in Turkey.

Chemical production (excluding pharmaceuticals)

Real change compared with previous year

	2022	2021
World	2.2%	6.1%
European Union	-5.8%	6.3%
United States	2.3%	1.7%
Emerging markets of Asia excluding China	-1.1%	6.5%
China	6.6%	7.7%
Japan	-3.0%	3.8%
South America	2.6%	3.6%

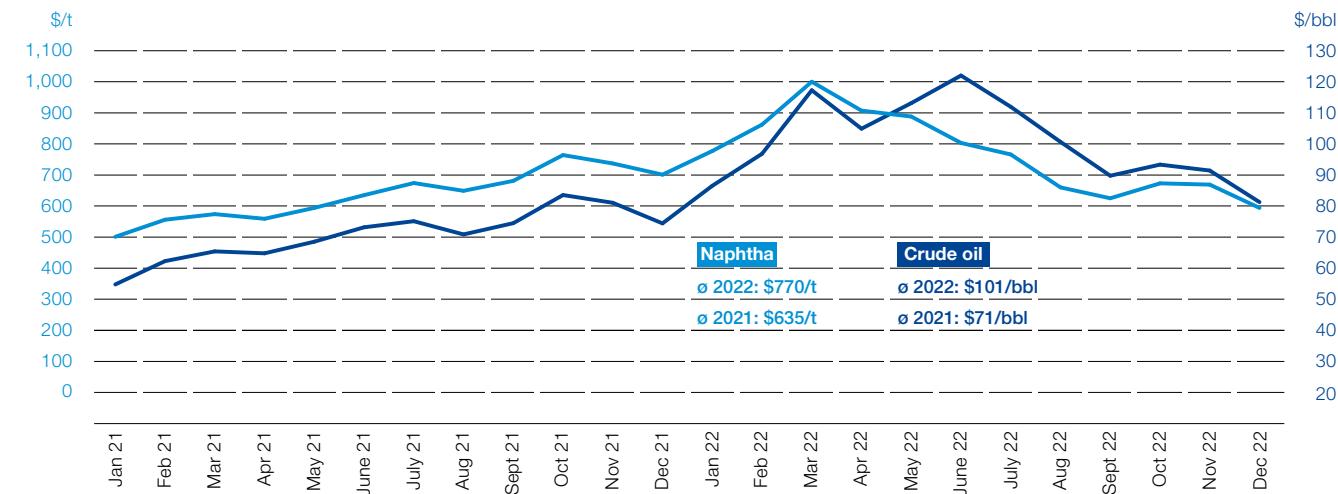
Price trends for key commodities

The Russian war against Ukraine and the associated tensions led to significant price increases on the international commodity markets and high price volatility.

Overall, oil demand grew at a slightly weaker rate than global GDP in 2022. The increase in travel in the advanced economies boosted demand for oil, while demand in China declined slightly due to continued travel restrictions and temporary lockdowns. Crude oil prices rose from \$71 per barrel of Brent in 2021 to \$101 per barrel in 2022 due to growth in demand for oil, war and sanctions-related constraints and an OPEC+ production cut agreed in October. The price of oil fluctuated over the course of the year between around \$122 per barrel in June and around \$81 per barrel in December. Over the course of the year, the average monthly price for the chemical raw material naphtha ranged between \$1,012 per metric ton in March and \$594 per metric ton in December. At \$770 per metric ton, the annual average price of naphtha in 2022 was higher than in 2021 (\$635 per metric ton).

Price trends for crude oil (Brent) and naphtha

\$/barrel, \$/metric ton



Due to low gas storage levels in Europe at the end of the heating season in the second quarter of 2022 and the ongoing reduction in Russian gas supplies, gas prices on the Northwest European spot market rose sharply through August. At its peak, the monthly average price reached €235.94 per MWh (\$69.84 per mmBtu) in August. The lowest monthly average price was €75.87 per MWh (\$21.79 per mmBtu) in October. The annual average gas price in Northwest Europe in 2022 was €124.16 per MWh (\$38.01 per mmBtu) (2021: €46.88 per MWh / \$16.02 per mmBtu).

The average price of gas in the United States was \$6.36 per mmBtu, likewise well above the prior-year level (\$3.89 per mmBtu). Gas prices in China averaged around \$12.21 per mmBtu nationally (2021: \$11.96 per mmBtu).¹

¹ This report references the retail price for industrial end users. The 2021 Report cited wholesale prices in the gas market in China. This reference is no longer published.

Results of Operations

Global economic development in 2022 was exceptionally volatile and characterized by strong regional differences. Especially the war in Ukraine, rising raw materials and energy prices, high inflation and interest rates, as well as China's prolonged and strict zero-COVID policy took their toll on the markets. In this market environment, growth in the global economy, worldwide industrial production and chemical production were significantly weaker than we had expected at the beginning of the year. BASF's business was nevertheless robust: Sales increased considerably, while EBIT before special items was €6.9 billion, within the forecast range. At 10.0%, ROCE was considerably below the prior-year figure.

Exceptionally high impairment losses on the shareholding in Wintershall Dea AG negatively affected the BASF Group's net income from shareholdings.

 Business reviews by segment can be found from page 69 onward

For more information on the development of CO₂ emissions, see page 135 onward

At a glance

- Sales considerably higher than previous year
- EBIT before special items and ROCE down sharply
- Net income from shareholdings down by –€4,939 million
- Earnings per share of –€0.70; adjusted earnings per share of €6.96

Compared with the previous year, **sales** rose by €8,729 million to €87,327 million in the 2022 business year. Sales growth was mainly driven by higher prices across almost all segments due to an increase in raw materials and energy prices. The Materials and Chemicals segments implemented the highest price increases. Currency effects considerably supported the positive sales development. Portfolio effects in the Surface Technologies segment from the acquisition of a majority shareholding in BASF Shanshan Battery

Materials Co., Ltd. as of August 31, 2021, also contributed to the sales increase. This more than compensated for negative portfolio effects in the Industrial Solutions segment, mainly from the sale of the global pigments business as of June 30, 2021. Significantly lower volumes overall dampened sales growth in the BASF Group. Volumes development was primarily driven by lower sales volumes in the Surface Technologies and Chemicals segments.

Sales

Million €

2022	87,327
2021	78,598
2020	59,149
2019	59,316
2018 ^a	60,220

^a Sales for 2018 were reduced by the share attributable to construction chemicals activities due to their presentation as discontinued operations.

Factors influencing sales of the BASF Group

	Change in million €	Change in %
Volumes	-5,498	-7.0
Prices	9,350	11.9
Currencies	4,765	6.1
Acquisitions	790	1.0
Divestitures	-564	-0.7
Changes in the scope of consolidation	-114	-0.1
Total change in sales	8,729	11.1

At €6,878 million, **income from operations (EBIT) before special items** was €890 million below the prior-year figure. The earnings development was attributable to a strong decline in earnings contributions from the Chemicals and Materials segments. Both segments recorded lower margins and volumes as well as higher fixed costs. By contrast, EBIT before special items rose in all other

segments. The Agricultural Solutions segment increased EBIT before special items considerably, in particular as a result of the positive sales performance. The Nutrition & Care segment also achieved a considerable increase here, mainly due to price-driven margin growth. The Surface Technologies segment recorded considerably higher earnings, especially due to increased earnings contributions from the automotive catalysts and battery materials businesses. Higher prices and volumes in the Coatings division additionally supported the segment's earnings performance. The Industrial Solutions segment slightly increased EBIT before special items as a result of price-driven margin growth. EBIT before special items attributable to Other improved slightly.

 For an explanation of the indicator EBIT before special items, see page 42

EBIT before special items

Million €

2022	6,878
2021	7,768
2020	3,560
2019 ^a	4,643
2018 ^{a,b}	6,281

^a EBIT before special items for 2019 has been restated to reflect the reclassification of income from non-integral companies accounted for using the equity method to net income from shareholdings. Figures for 2018 have not been restated.

^b EBIT before special items for 2018 was reduced by the share attributable to construction chemicals activities due to their presentation as discontinued operations.

Special items in EBIT amounted to –€330 million in 2022 compared with –€91 million in the previous year. Special charges for restructuring measures were €249 million, mainly in connection with the carve-out of the newly established BASF Environmental Catalyst and Metal Solutions unit within the Catalysts division, the discontinuation of our business activities in Russia and restructuring measures. In other charges and income, the impairment loss on a plant in the Chemicals segment in particular led to total special charges of €222 million (2021: other charges of €27 million). Integration costs amounted to €32 million compared with €85 million in the previous year; in both years, these were primarily related to the integration of the BASF Shanshan companies acquired in 2021.

Special income from divestitures totaled €174 million, mainly from the sale of 51% of our share in the Hollandse Kust Zuid offshore wind farm. This was partly offset by impairments in connection with the planned divestiture of our production site in De Meern, Netherlands.

 For the definition of special items, see page 42

Special items

Million €

	2022	2021
Restructuring measures	-249	-99
Integration costs	-32	-85
Divestitures	174	120
Other charges and income	-222	-27
Total special items in EBIT	-330	-91

At €6,548 million, **EBIT** for the BASF Group in 2022 was considerably lower than the previous year. This figure includes income from integral companies accounted for using the equity method, which declined by €289 million to €386 million. This was mainly attributable to the €196 million lower earnings contribution by BASF-YPC Company Ltd., Nanjing, China.

EBIT	
	Million €
2022	6,548
2021	7,677
2020	-191
2019 ^a	4,201
2018 ^{a, b}	5,974

a EBIT for 2019 has been restated to reflect the reclassification of income from non-integral companies accounted for using the equity method to net income from shareholdings. Figures for 2018 have not been restated.

b EBIT for 2018 was reduced by the share attributable to construction chemicals activities due to their presentation as discontinued operations.

We use the indicator **return on capital employed (ROCE)** to measure our rate of return. ROCE declined to 10.0% (2021: 13.7%) due to a significant increase in the cost of capital basis and a simultaneous decrease in earnings.¹

 For more information on the calculation of ROCE, see page 41

The calculation of EBIT as part of our statement of income is shown in the Consolidated Financial Statements on page 203

ROCE ^a		2022	2021
	Million €		
EBIT of the BASF Group		6,548	7,677
- EBIT of Other		-523	-759
EBIT of the segments		7,070	8,435
Cost of capital basis of segments, average of month-end figures		70,982	61,664
ROCE	%	10.0	13.7

Capital employed^a

Million €

	2022	2021
Intangible assets	13,576	13,143
+ Property, plant and equipment	21,374	19,280
+ Integral investments accounted for using the equity method	2,052	1,767
+ Inventories	15,608	11,459
+ Accounts receivable, trade	13,919	11,588
+ Current and noncurrent other receivables and other assets ^b	4,309	3,908
+ Assets of disposal groups	144	520
Cost of capital basis of segments, average of month-end figures	70,982	61,664
+ Deviation from cost of capital basis at closing rates as of December 31	-3,300	2,717
+ Assets not included in cost of capital	16,791	23,002
Assets of the BASF Group as of December 31	84,472	87,383

a The polyolefins and styrenics businesses of the joint venture BASF-YPC Company Ltd., Nanjing, China, which were previously reported under Other, were allocated to the Petrochemicals division as of January 1, 2022. The prior-year figures have been adjusted.

b Including customer/supplier financing and other adjustments

Net income from shareholdings, financial result and income after taxes

Net income from shareholdings amounted to –€4,939 million in 2022, after €207 million in 2021. The significant decline was due to special charges of around €6.3 billion, mainly from non-cash-effective impairment losses on the shareholding in Wintershall Dea AG. These were especially due to the deconsolidation of Wintershall Dea's Russian exploration and production activities, which subsequently resulted in a revaluation of Wintershall Dea's Russian shareholdings. Furthermore, write-downs were performed on the company's European gas transportation business, including a complete impairment on the shareholding in Nord Stream AG and the financing of the Nord Stream 2 project. Wintershall Dea's operating earnings contribution for 2022 rose to approximately €1.5 billion, after €335 million in the previous year.

The **financial result** improved by €17 million to –€418 million. This was mainly attributable to the €136 million improvement in the other financial result. This predominantly resulted from higher net interest income on income taxes and lower net expense in connection with bonds in foreign currency and related hedging instruments. By contrast, the interest result decreased by €119 million to –€433 million, especially driven by higher interest expenses for financial indebtedness due to increased interest rates and a higher financing volume.

Overall, **income before income taxes** amounted to €1,190 million in 2022, after €7,448 million in the previous year. Income tax expenses were €1,581 million (2021: €1,430 million). Given the high impairment losses in net income from shareholdings, which do not have an impact on tax expense, the tax rate was 132.9%.

Noncontrolling interests amounted to €236 million compared with €459 million in 2021, primarily due to lower earnings contributions from BASF TotalEnergies Petrochemicals LLC, Houston, Texas, and

BASF PETRONAS Chemicals Sdn. Bhd., Kuala Lumpur, Malaysia. This was partially offset by higher earnings contributions from the BASF Shanshan companies.

Net income was –€627 million compared with €5,523 million in 2021.

Earnings per share amounted to –€0.70 compared with €6.01 in the previous year.

For more information on the items in the statement of income, see the Notes to the Consolidated Financial Statements on page 203

For more information on the tax rate, see Note 12 to the Consolidated Financial Statements from page 237 onward

Additional indicators for results of operations

We also use alternative performance measures (APMs) to steer the BASF Group. Investors, analysts and rating agencies use them to assess our performance. These are not defined by IFRS. As such, the methods of calculation can differ from those used by other companies. Alternative performance measures for the results of operations are EBIT before special items, EBITDA before special items, EBITDA, the EBITDA margin and adjusted earnings per share. Other APMs are net debt,¹ free cash flow¹ and capital expenditures (capex).²

Income from operations before depreciation, amortization and special items (EBITDA before special items) and **income from operations before depreciation and amortization (EBITDA)** are indicators that describe operational performance independent of age-related depreciation and amortization of assets and any impairment or reversal of impairment. Both figures are therefore particularly useful in cross-company comparisons. EBITDA before special items is also highly useful in making comparisons over time. The EBITDA margin is a relative indicator and is calculated as the ratio of EBITDA

to sales revenue, enabling operational performance to be compared independently of the size of the underlying business.

EBITDA before special items in 2022 was €585 million below the 2021 figure at €10,762 million; EBITDA decreased by €607 million to €10,748 million. The EBITDA margin was 12.3% in 2022 compared with 14.4% in the previous year.

EBITDA before special items

Million €	2022	2021
EBIT	6,548	7,677
– Special items	–330	–91
EBIT before special items	6,878	7,768
+ Depreciation and amortization	3,827	3,534
+ Impairments and reversals of impairments on property, plant and equipment and intangible assets before special items	57	45
Depreciation, amortization, impairments and reversals of impairments on property, plant and equipment and intangible assets before special items	3,885	3,580
EBITDA before special items	10,762	11,348

¹ For more information on these indicators, see the Financial Position from page 63 onward.

² For more information on capex, see Our Steering Concept on page 42 and Material Investments and Portfolio Measures on page 37.

EBITDA

Million €

	2022	2021
EBIT	6,548	7,677
+ Depreciation and amortization	3,827	3,534
+ Impairments and reversals of impairments on property, plant and equipment and intangible assets	373	144
Depreciation, amortization, impairments and reversals of impairments on property, plant and equipment and intangible assets	4,200	3,678
EBITDA	10,748	11,355
Sales revenue	87,327	78,598
EBITDA margin	12.3	14.4

Compared with earnings per share, **adjusted earnings per share** is firstly adjusted for special items. Amortization, impairments and reversals of impairments on intangible assets are then eliminated. Amortization of intangible assets primarily results from the purchase price allocation following acquisitions and is therefore of a temporary nature. The effects of these adjustments on income taxes and on noncontrolling interests are also considered. This makes adjusted earnings per share a suitable measure for making comparisons over time and predicting future profitability.

In 2022, adjusted earnings per share amounted to €6.96 compared with €6.76 in the previous year.

 For more information on the earnings per share according to IFRS, see Note 6 to the Consolidated Financial Statements on page [226](#)

Adjusted earnings per share

Million €

	2022	2021
Income after taxes	-391	5,982
- Special items ^a	-6,637	-181
+ Amortization, impairments and reversals of impairments on intangible assets	652	614
- Amortization, impairments and reversals of impairments on intangible assets contained in special items	0	0
- Adjustments to income taxes	372	116
- Adjustments to income after taxes from discontinued operations	-	-36
Adjusted income after taxes	6,526	6,695
- Adjusted noncontrolling interests	248	483
Adjusted net income	6,278	6,212
Weighted average number of outstanding shares (in thousands) ^b	901,754	918,479
Adjusted earnings per share	€ 6.96	6.76

^a Includes special items in net income from shareholdings of -€6,307 million for 2022 and -€90 million for 2021.

^b Due to the current share buyback program, the weighted average number of outstanding shares in the 2022 business year was 901,754,219.

Sales and earnings

Million €

	2022	2021	+/-
Sales	87,327	78,598	11.1%
Income from operations before depreciation, amortization and special items	10,762	11,348	-5.2%
Income from operations before depreciation and amortization (EBITDA)	10,748	11,355	-5.3%
EBITDA margin %	12.3	14.4	-
Depreciation and amortization ^a	4,200	3,678	14.2%
Income from operations (EBIT)	6,548	7,677	-14.7%
Special items	-330	-91	-263.9%
EBIT before special items	6,878	7,768	-11.5%
Income before income taxes	1,190	7,448	-84.0%
Income after taxes from continuing operations	-391	6,018	.
Income after taxes from discontinued operations	-	-36	100.0%
Net income	-627	5,523	.
Earnings per share €	-0.70	6.01	.
Adjusted earnings per share €	6.96	6.76	3.0%

^a Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

Sales and earnings by quarter in 2022^a

Million €

	Q1	Q2	Q3	Q4	Full year
Sales	23,083	22,974	21,946	19,323	87,327
Income from operations before depreciation, amortization and special items	3,743	3,293	2,325	1,401	10,762
Income from operations before depreciation and amortization (EBITDA)	3,709	3,396	2,255	1,389	10,748
Depreciation and amortization ^b	924	1,046	960	1,270	4,200
Income from operations (EBIT)	2,785	2,350	1,294	119	6,548
Special items	-34	11	-53	-254	-330
EBIT before special items	2,818	2,339	1,348	373	6,878
Income before income taxes	1,878	2,658	1,239	-4,585	1,190
Income after taxes from continuing operations	1,321	2,179	952	-4,843	-391
Income after taxes from discontinued operations	-	-	-	-	-
Net income	1,221	2,090	909	-4,847	-627
Earnings per share €	1.34	2.31	1.01	-5.42	-0.70
Adjusted earnings per share €	2.70	2.37	1.77	0.09	6.96

Sales and earnings by quarter in 2021^a

Million €

	Q1	Q2	Q3	Q4	Full year
Sales	19,400	19,753	19,669	19,776	78,598
Income from operations before depreciation, amortization and special items	3,181	3,217	2,771	2,179	11,348
Income from operations before depreciation and amortization (EBITDA)	3,176	3,199	2,729	2,250	11,355
Depreciation and amortization ^b	865	883	907	1,023	3,678
Income from operations (EBIT)	2,311	2,316	1,822	1,227	7,677
Special items	-10	-39	-43	1	-91
EBIT before special items	2,321	2,355	1,865	1,227	7,768
Income before income taxes	2,247	2,189	1,777	1,235	7,448
Income after taxes from continuing operations	1,810	1,794	1,424	990	6,018
Income after taxes from discontinued operations	-	-	-43	7	-36
Net income	1,718	1,654	1,253	898	5,523
Earnings per share €	1.87	1.80	1.36	0.98	6.01
Adjusted earnings per share €	2.00	2.03	1.56	1.17	6.76

^a Quarterly results not audited.

^b Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

Net Assets

Assets

	December 31, 2022		December 31, 2021	
	Million €	%	Million €	%
Intangible assets	13,273	15.8	13,499	15.5
Property, plant and equipment	22,967	27.3	21,553	24.7
Integral investments accounted for using the equity method	2,356	2.8	2,540	2.9
Non-integral investments accounted for using the equity method	4,645	5.5	9,843	11.3
Other financial assets	1,120	1.3	575	0.7
Deferred tax assets	880	1.0	2,600	3.0
Other receivables and miscellaneous assets	1,810	2.2	1,722	2.0
Noncurrent assets	47,050	55.7	52,332	59.9
Inventories	16,028	19.0	13,868	15.9
Accounts receivable, trade	12,055	14.3	11,942	13.7
Other receivables and miscellaneous assets	6,591	7.8	5,568	6.4
Marketable securities	232	0.3	208	0.2
Cash and cash equivalents	2,516	3.0	2,624	3.0
Assets of disposal groups	–	–	840	1.0
Current assets	37,422	44.4	35,051	40.1
Total assets	84,472	100.0	87,383	100.0

Assets

At a glance

- Decrease in total assets to €84.5 billion, mainly due to impairments on the shareholding in Wintershall Dea AG of around €6.5 billion
- Current assets up €2.4 billion, primarily as a result of higher inventories

Total assets amounted to €84,472 million as of December 31, 2022, €2,910 million below the prior year-end figure.

Noncurrent assets declined by €5,282 million compared with December 31, 2021, to €47,050 million. This was largely attributable to the €5,198 million decrease in the carrying amounts of non-integral shareholdings accounted for using the equity method, mainly due to impairments on the shareholding in Wintershall Dea AG totaling €6,531 million. These primarily related to Wintershall Dea's Russian activities and its European gas transportation business.

Deferred tax assets declined by €1,720 million, mainly due to lower pension provisions.

Intangible assets amounted to €13,273 million, €227 million below the prior year-end figure. This largely reflected amortization of €648 million, which was partially offset by additions of €125 million. Currency effects increased intangible assets by €330 million. Goodwill rose by €176 million to €7,696 million, mainly from currency effects.

Compared with the end of the previous year, the carrying amounts of integral investments accounted for using the equity method declined by €184 million to €2,356 million. The addition of the interest in the Hollandse Kust Zuid wind farm following the sale of shares was offset by decreases at Lucura Versicherungs AG due to the transition to full consolidation and at BASF-YPG Company Ltd., Nanjing, China.

The €1,414 million increase in property, plant and equipment was mainly due to additions of €4,842 million, which exceeded depreciation by €1,273 million. Currency effects of €286 million also contributed to the increase.

Other financial assets were €545 million higher than the prior year-end figure, in particular from the first-time inclusion of Lucura Versicherungs AG in the consolidated financial statements as a fully consolidated company.

Noncurrent other receivables and miscellaneous assets amounted to €1,810 million, up €88 million from the previous year, largely as a result of higher defined benefit assets.

Current assets rose by €2,371 million compared with December 31, 2021, primarily from the €2,159 million increase in inventories; the Agricultural Solutions segment in particular recorded inventory growth.

Other current receivables and miscellaneous assets rose by €1,023 million, mainly due to higher precious metal trading items, higher positive fair values of derivatives and higher tax refund claims.

Trade accounts receivable increased by €114 million year on year.

The assets reported as disposal groups as of December 31, 2021, were divested in 2022: BASF sold 51% of its interest in the Hollandse Kust Zuid wind farm in the second quarter and the divestiture of the kaolin minerals business was completed on September 30.

At €2,516 million, cash and cash equivalents were €108 million below the figure as of December 31, 2021.

 For more information on the composition and development of individual asset items, see the Notes to the Consolidated Financial Statements from page [209](#) onward

Financial Position

Equity and liabilities

	December 31, 2022		December 31, 2021	
	Million €	%	Million €	%
Subscribed capital	1,144	1.4	1,176	1.4
Capital reserves	3,147	3.7	3,106	3.6
Retained earnings	35,453	42.1	40,365	46.2
Other comprehensive income	-171	-0.2	-3,855	-4.4
Noncontrolling interests	1,350	1.6	1,289	1.5
Equity	40,923	48.4	42,081	48.2
Provisions for pensions and similar obligations	2,810	3.3	6,160	7.1
Deferred tax liabilities	1,543	1.8	1,499	1.7
Tax provisions	330	0.4	415	0.5
Other provisions	1,650	2.0	1,782	2.0
Financial indebtedness	15,171	18.0	13,764	15.8
Other liabilities	1,606	1.9	1,600	1.8
Noncurrent liabilities	23,110	27.4	25,220	28.9
Accounts payable, trade	8,434	10.0	7,826	9.0
Provisions	3,799	4.5	3,935	4.5
Tax liabilities	995	1.2	1,161	1.3
Financial indebtedness	3,844	4.6	3,420	3.9
Other liabilities	3,368	4.0	3,679	4.2
Liabilities of disposal groups	-	-	61	0.1
Current liabilities	20,440	24.3	20,081	23.0
Total equity and liabilities	84,472	100.0	87,383	100.0

Equity and liabilities

At a glance

- Equity ratio of 48.4% at prior-year level
- Net debt rose to €16,268 million
- Rated A by Standard & Poor's, Moody's and Fitch
- Cash flows from operating activities above previous year

Equity declined by €1,159 million compared with the previous year to €40,923 million. Retained earnings were €4,912 million below the figure as of December 31, 2021. This was due to the negative net income, share buybacks in the amount of €1.3 billion and dividend payments for 2021 of €3.1 billion. By contrast, other comprehensive income rose by €3,683 million, mainly from actuarial gains and currency effects.

At 48.4%, the equity ratio was at the prior-year level (48.2%).

Noncurrent liabilities declined by €2,110 million compared with the 2021 year-end. This was primarily attributable to the €3,351 million decrease in provisions for pensions and similar obligations, mainly as a result of higher interest rates in all relevant currency zones.

The €133 million decrease in other provisions largely resulted from lower provisions for interest on tax risks and for personnel expenses.

In addition, tax provisions decreased by €85 million.

The €1,407 million increase in noncurrent financial indebtedness primarily reflected the issue of new euro-denominated bonds with a total volume of €3,484 million. This was partially offset by the reclassification of three bonds with an aggregate carrying amount of €2,035 million from noncurrent to current financial indebtedness.

Deferred tax liabilities rose slightly compared with the prior year-end to €1,543 million.

Other noncurrent liabilities were on a level with the previous year, at €1,606 million.

Current liabilities rose by €359 million to €20,440 million, primarily as a result of the €609 million increase in trade accounts payable. In addition, current financial indebtedness was €424 million above the figure as of December 31, 2021. This was attributable to the above-mentioned reclassification of three bonds in the aggregate amount of around €2.1 billion from noncurrent to current financial indebtedness, including interest and currency effects, as well as to the €406 million increase in commercial paper at BASF SE. This was partially offset by the scheduled repayment of three bonds totaling around €2 billion.

Other liabilities declined by €312 million year on year, mainly due to lower liabilities from precious metal trading and lower negative fair values of derivatives.

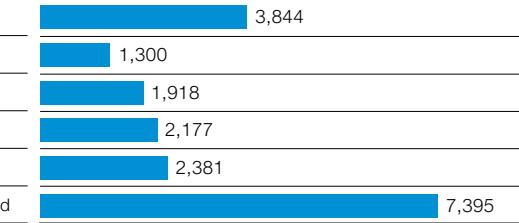
Tax liabilities decreased by €166 million.

Furthermore, current provisions were €136 million below the prior-year figure, largely as a result of lower provisions for bonus payments as well as for restructuring; higher provisions for rebates had an offsetting effect.

Net debt rose by €1,916 million compared with December 31, 2021, to €16,268 million.

 For more information on the composition and development of individual equity and liability items, see the Notes to the Consolidated Financial Statements from page 209 onward

For more information on the development of the balance sheet, see the Ten-Year Summary on page 293

Net debt Million €	December 31, 2022		December 31, 2021		
Noncurrent financial indebtedness	15,171		13,764		
+ Current financial indebtedness	3,844		3,420		
Financial indebtedness	19,016		17,184		
- Marketable securities	232		208		
- Cash and cash equivalents	2,516		2,624		
Net debt	16,268		14,352		

Off-balance sheet obligations

Off-balance sheet obligations mainly relate to long-term purchase obligations for raw materials and long-term supply agreements for electricity from renewable sources. In addition, obligations exist in connection with initiated or planned investment projects (2022: €13,982 million). In 2022, new obligations of this type arose primarily in connection with the construction of the new BASF Verbund site in Zhanjiang, China.

 For more information, see Note 25 to the Consolidated Financial Statements on page 268 and the forecast from page 154 onward

Financing policy and credit ratings

Our financing policy aims to ensure our solvency at all times, limiting the risks associated with financing and optimizing our cost of capital. We preferably meet our external financing needs on the international capital markets.

We strive to maintain a solid A rating, which ensures unrestricted access to financial and capital markets. Our financing measures are aligned with our operational business planning as well as the company's strategic direction and also ensure the financial flexibility to take advantage of strategic options.

Maturities of financial indebtedness	
2023	3,844
2024	1,300
2025	1,918
2026	2,177
2027	2,381
2028 and beyond	7,395

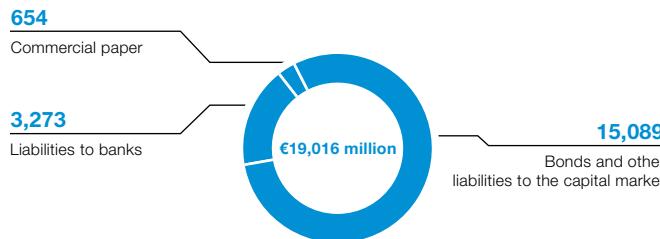
BASF enjoys good credit ratings, especially compared with competitors in the chemical industry. Moody's most recently confirmed its rating of A3/P-2/outlook stable on January 18, 2023. Standard & Poor's confirmed its rating of A/A-1/outlook negative on December 8, 2022. Fitch maintained its rating of A/F1/outlook stable on November 30, 2022.

We have solid financing, both for ongoing business and for investment projects initiated or planned. Corporate bonds form the basis of our medium to long-term debt financing. These are issued in euros and other currencies with different maturities as part of our €20 billion debt issuance program. The goal is to create a balanced maturity profile, diversify our financing and optimize our debt capital financing conditions.

For short-term financing, we use BASF SE's global commercial paper program, which has an issuing volume of up to \$12.5 billion. As of December 31, 2022, commercial paper with a carrying amount of €654 million was outstanding under this program. A firmly committed, syndicated credit line of €6 billion with a term until 2026 covers the repayment of outstanding commercial paper. It can also be used for general company purposes. This credit line and another short-term credit line of €3 billion that was taken out in April 2022 were not used at any point in 2022. Our external financing is therefore largely independent of short-term fluctuations in the credit markets.

Financing instruments

Million €



BASF Group's most important financial contracts contain no side agreements with regard to specific financial ratios (financial covenants) or compliance with a specific rating (rating trigger).

To minimize risks and leverage internal optimization potential within the Group, we bundle the financing, financial investments and foreign currency hedging of BASF SE's subsidiaries within the BASF Group where possible. Foreign currency risks are primarily hedged centrally using derivative financial instruments in the market.

Our interest risk management generally pursues the goal of reducing interest expenses for the BASF Group and limiting interest risks. Interest rate hedging transactions are therefore conducted with banks in order to turn selected liabilities to the capital market from fixed to variable interest rates or vice versa.

For more information on the financing tools and hedging instruments used, see Note 21 from page 257 onward and Note 26 from page 269 onward in the Notes to the Consolidated Financial Statements

Statement of cash flows

Cash flows from operating activities amounted to €7,709 million, compared with €7,245 million in the previous year. The improvement was primarily due to lower cash tied up in net working capital as well as to higher depreciation and amortization. Net income declined by €6,150 million year on year to –€627 million. The loss is mainly attributable to the negative equity-accounted earnings contribution from Wintershall Dea AG (–€4,853 million), which is eliminated as a noncash effect in miscellaneous items. Depreciation and amortization of property, plant and equipment and intangible assets was €514 million above the prior-year figure.

The €935 million decrease in cash tied up in net working capital in 2022 is partly due to the reduction in trade accounts receivable, which had increased significantly in the previous year. In addition, less cash was tied up in inventories in the year under review than in 2021. Dividend payments from shareholdings accounted for using the equity method and other shareholdings recognized under other receivables rose by €946 million. By contrast, the reduction in other provisions led to an outflow of cash. In particular, bonus payments to employees in 2022 were significantly higher than in the previous year. Moreover, the increase in trade accounts payable in the year under review was not as strong as in the previous year.

Cash flows from investing activities totaled –€3,778 million in 2022, after –€2,622 million in the previous year. Payments made for property, plant and equipment and intangible assets rose by €843 million to €4,375 million, mainly due to investments in the new Verbund site in Zhanjiang, China. Payments received from divestitures in the amount of €691 million resulted primarily from the sale of shares in the Hollandse Kust Zuid wind farm and the sale of the kaolin minerals business. These were partially offset by cash outflows of €13 million for a subsequent purchase price adjustment from the acquisition of Solvay's polyamide business. In 2021, payments received for divestitures amounted to €1,030 million and mainly related to the sale of the global pigments business. An offsetting effect in 2021 was the €600 million payment made for the acquisition of 51% of BASF Shanshan Battery Materials Co., Ltd. In addition, the sale of our shares in Solenis led to cash inflows in the previous year.

Cash flows from financing activities amounted to –€4,013 million. In addition to the payment of dividends in the amount of €3,248 million (2021: €3,312 million), BASF bought back own shares worth €1,325 million. This was partially offset by net additions to financial and similar liabilities of €565 million (2021: net disposal of €3,145 million).

Free cash flow, which remains after deducting payments made for property, plant and equipment and intangible assets from cash flows from operating activities, represents the financial resources remaining after investments. It amounted to €3,333 million in 2022 after €3,713 million in the previous year.

Statement of cash flows

Million €

	2022	2021
Net income	-627	5,523
Depreciation and amortization of property, plant and equipment and intangible assets	4,200	3,687
Changes in net working capital	-632	-1,566
Miscellaneous items	4,767	-398
Cash flows from operating activities	7,709	7,245
Payments made for property, plant and equipment and intangible assets	-4,375	-3,532
Acquisitions/divestitures	678	430
Changes in financial assets and miscellaneous items	-81	480
Cash flows from investing activities	-3,778	-2,622
Capital increases/repayments and other equity transactions	-1,331	-
Changes in financial and similar liabilities	565	-3,145
Dividends	-3,248	-3,312
Cash flows from financing activities	-4,013	-6,457
Cash-effective changes in cash and cash equivalents	-83	-1,834
Changes in cash and cash equivalents from foreign exchange rates and changes in the scope of consolidation	-25	123
Cash and cash equivalents at the beginning of the year	2,624	4,335
Cash and cash equivalents at the end of the year	2,516	2,624

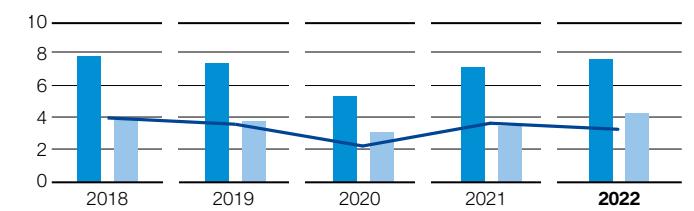
Free cash flow

Million €

	2022	2021
Cash flows from operating activities	7,709	7,245
- Payments made for property, plant and equipment and intangible assets	4,375	3,532
Free cash flow	3,333	3,713

Cash flow

Billion €



■ Cash flows from operating activities

■ Payments made for property, plant and equipment and intangible assets

■ Free cash flow

Actual Development Compared With Outlook for 2022

Sales, earnings and ROCE forecast for the BASF Group

The BASF Group increased **sales** to €87.3 billion in 2022, significantly exceeding the range forecast at the beginning of the year of €74 billion to €77 billion. However, sales were within the forecast range of €86 billion to €89 billion communicated in July 2022. The Materials, Chemicals and Industrial Solutions segments outperformed initial forecasts with considerable sales growth. We had originally anticipated only a slight increase in the Materials segment. We had expected a considerable decline in the Chemicals segment and a slight decrease in the Industrial Solutions segment. Sales in Other also improved considerably instead of slightly as forecast. Growth in BASF Group sales was mainly driven by significant price increases in the segments as a result of raw materials and energy price developments. Portfolio effects had a positive impact, as expected. We were only able to increase sales volumes as forecast in the Agricultural Solutions segment. Contrary to our expectations, we recorded lower volumes in all other segments as a result of weaker demand.

At €6.9 billion, **EBIT before special items** was within both the forecast range of €6.6 billion to €7.2 billion from February 2022 and the adjusted range of €6.8 billion to €7.2 billion from July 2022. The Agricultural Solutions and Nutrition & Care segments considerably increased EBIT before special items, as expected. The Chemicals and Materials segments recorded a considerable decline in earnings as forecast. The Surface Technologies and Industrial Solutions segments did not develop as expected: The Surface Technologies segment significantly increased EBIT before special items, while the Industrial Solutions segment recorded slight earnings growth; we had assumed a slight deterioration in earnings in each case. EBIT before special items in Other improved slightly, also performing better than expected. We had forecast a considerable decrease.

Forecast/actual comparison

	Sales		EBIT before special items		ROCE	
	2022 forecast	2022 actual	2022 forecast	2022 actual	2022 forecast	2022 actual
Chemicals	⬇️	⬆️	⬇️	⬇️	⬇️	⬇️
Materials	↗️	⬆️	⬇️	⬇️	⬇️	⬇️
Industrial Solutions	⬇️	⬆️	⬇️	↗️	↗️	↗️
Surface Technologies	⬇️	⬇️	⬇️	↗️	⬇️	⬇️
Nutrition & Care	⬆️	⬆️	⬆️	⬆️	⬆️	⬇️
Agricultural Solutions	⬆️	⬆️	⬆️	⬆️	⬆️	⬆️
Other	↗️	⬆️	⬇️	↗️	–	–
BASF Group	€74 billion– €77 billion^a	€87.3 billion	€6.6 billion– €7.2 billion^a	€6.9 billion	11.4%–12.6%^a	10.0%

↗️ At prior-year level: no change (+/-0.0%)

⬇️ Slight increase/decrease: "slight" represents a change of 0.1%–5.0% for sales; 0.1%–10.0% for earnings; 0.1 to 1.0 percentage points for ROCE

⬇️ Considerable increase/decrease: "considerable" represents a change of 5.1% or higher for sales; 10.1% or higher for earnings; more than 1.0 percentage points for ROCE

^a We updated our outlook in July 2022, forecasting sales of between €86 billion and €89 billion, EBIT before special items of between €6.8 billion and €7.2 billion, and a ROCE of between 10.5% and 11.0%.

At 10.0%, **ROCE** was above the cost of capital of 9%. Our expectations for ROCE materialized in all segments except Nutrition & Care, where ROCE was slightly lower instead of considerably higher as forecast. Overall, ROCE for the BASF Group amounted to 10.0%, below the range we had forecast in February of between 11.4% and 12.6% and below the revised range from July 2022 of 10.5% to 11.0%. This reflected a significant increase in the cost of capital base amid lower earnings.

CO₂ emissions forecast for the BASF Group

CO₂ emissions amounted to 18.4 million metric tons, well below the range forecast in February 2022 of 19.6 million metric tons to 20.6 million metric tons and at the lower end of the adjusted range from July 2022 of 18.4 million metric tons to 19.4 million metric tons. The main drivers here were the significant reduction in production volumes and the temporary shutdown of emission-intensive plants. One example is the ammonia plants, where production was curbed or temporarily shut down due to high natural gas prices. We continued to use electricity from renewable sources and purchase green electricity certificates.

Capex forecast for the BASF Group

In 2022, we invested a total of €4.1 billion in capital expenditures (capex), excluding additions from acquisitions, IT investments, restoration obligations and right-of-use assets arising from leases. The figure forecast in February 2022 was around €4.6 billion.

Sales, earnings and ROCE forecast for the segments

We considerably increased sales in the **Chemicals** segment in 2022 after forecasting a considerable decrease at the beginning of the year. Contrary to expectations, both divisions were able to significantly raise prices following sharp increases in raw materials and energy prices. At the beginning of 2022, we initially expected prices to decrease. Volumes were lower than expected due to weaker demand, especially in the second half of the year. The segment's EBIT before special items and ROCE declined considerably, as forecast.

Contrary to our assumption of slight sales growth, the **Materials** segment increased sales considerably. Here, too, this was mainly due to significant price increases after we had assumed lower prices in February. Weaker demand reduced sales volumes in both divisions. We had initially expected volume growth. EBIT before special items and ROCE declined considerably as forecast.

Sales in the **Industrial Solutions** segment rose considerably in 2022, despite our expectations of a slight decline. This was mainly due to significantly higher prices than originally assumed. These more than offset both the negative portfolio effects from the divestiture of the global pigments business and lower sales volumes. In February, we had assumed that volumes could be increased. The segment's EBIT before special items rose slightly, contrary to our forecast of a slight decrease. The expected margin-driven earnings growth in the Performance Chemicals division more than offset the decline in the Dispersions & Resins division, which was mainly due to the divestiture of the global pigments business. ROCE was slightly above the prior-year level, as forecast.

In line with our forecast, sales in the **Surface Technologies** segment were considerably below the prior-year figure. EBIT before special items rose considerably; we had expected a slight decrease. The increase was due to considerable earnings growth in the Catalysts division as a result of higher earnings contributions from the automotive catalysts and battery materials businesses. This mainly reflected stronger growth in the automotive industry in 2022. ROCE was considerably lower, as forecast.

In the **Nutrition & Care** segment, sales and EBIT before special items rose considerably as expected. ROCE declined slightly, contrary to our forecast of a considerable increase. This was mainly attributable to higher net working capital due to the increase in energy and raw materials prices.

The **Agricultural Solutions** segment recorded strong growth in sales, EBIT before special items and ROCE, as expected.

Sales in **Other** improved considerably due to much stronger-than-forecast sales growth in commodity trading. We had originally assumed a slight sales increase. EBIT before special items was slightly above the prior-year level; we had expected a considerable decline. This was primarily attributable to higher income from the long-term incentive program, among other factors. Income also arose from hedging transactions.

 For more information on our forecast for 2023, see page [154](#) onward

For more information on investments, see page [37](#) onward

Business Review by Segment

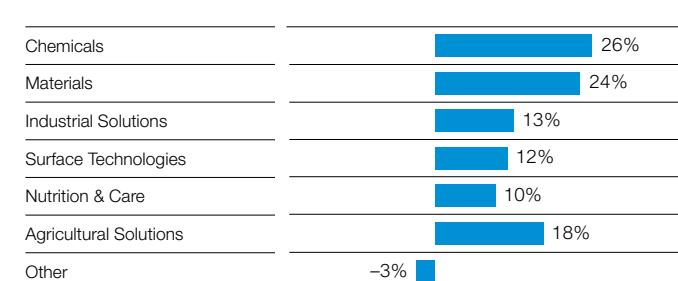
Segments:
 Chemicals
 Materials
 Industrial Solutions
 Surface Technologies
 Nutrition & Care
 Agricultural Solutions

Segment overview

Million €

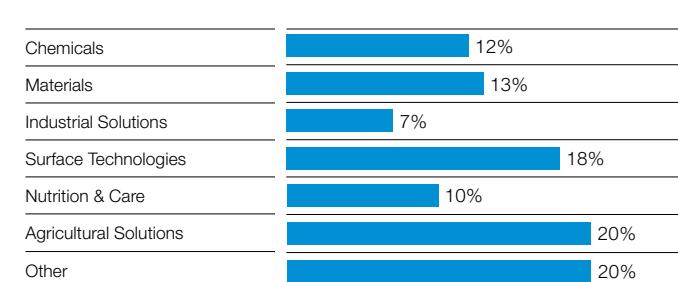
	Sales		Income from operations before depreciation and amortization (EBITDA)		Income from operations (EBIT) before special items	
	2022	2021	2022	2021	2022	2021
Chemicals	14,895	13,579	2,771	3,882 ^b	1,956	3,092 ^b
Materials	18,443	15,214	2,660	3,162	1,840	2,418
Industrial Solutions	9,992	8,876	1,443	1,344	1,091	1,006
Surface Technologies	21,283	22,659	1,264	1,243	902	800
Nutrition & Care	8,066	6,442	1,055	967	618	497
Agricultural Solutions	10,280	8,162	1,922	1,358	1,220	715
Other	4,368	3,666	-368	-602 ^b	-749	-761 ^b
BASF Group	87,327	78,598	10,748	11,355	6,878	7,768

Contributions to EBITDA by segment in 2022



	Income from operations (EBIT)		Assets		Investments including acquisitions ^a	
	2022	2021	2022	2021	2022	2021
Chemicals	1,758	3,115 ^b	10,481	10,482 ^b	1,701	1,157
Materials	1,776	2,345	10,864	11,286	880	709
Industrial Solutions	1,097	965	6,318	6,302	322	361
Surface Technologies	612	761	14,899	13,769	740	1,469
Nutrition & Care	605	554	8,038	7,231	642	654
Agricultural Solutions	1,221	696	17,071	15,305	414	347
Other	-523	-759 ^b	16,803	23,007 ^b	268	183
BASF Group	6,548	7,677	84,472	87,383	4,967	4,881

Contributions to assets by segment in 2022



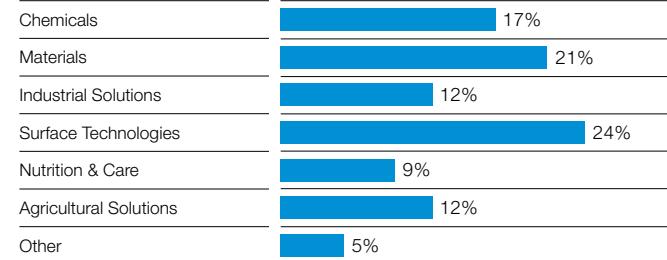
^a Additions to property, plant and equipment (of which €332 million from acquisitions in 2021) and intangible assets (of which €392 million from acquisitions in 2021)

^b BASF's ethylene value chain was reorganized internally as of January 1, 2022. In this connection, the polyolefins and styrenics businesses of the joint venture BASF-YPG Company Ltd., Nanjing, China, which were previously reported under Other, were allocated to the Petrochemicals division. The prior-year figures have been adjusted. This reduced income from integral companies accounted for using the equity method, EBITDA before special items, EBITDA, EBIT and EBIT before special items in Other by €28 million in the first quarter of 2021 and increased these indicators in the Petrochemicals division accordingly (rounding differences are possible). The effect was €28 million in both the second and third quarters of 2021 and €34 million in the fourth quarter of 2021. The effect in full-year 2021 was €118 million. The operating assets were also reallocated as part of the reorganization and increased the Chemicals segment's assets by €114 million as of December 31, 2021.

Sales^a

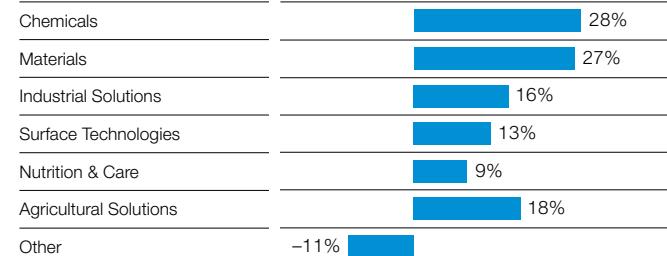
Million €

	Q1		Q2		Q3		Q4	
	2022	2021	2022	2021	2022	2021	2022	2021
Chemicals	4,004	2,736	4,349	3,419	3,793	3,693	2,749	3,731
Materials	4,821	3,447	4,862	3,743	4,715	3,973	4,045	4,052
Industrial Solutions	2,493	2,108	2,643	2,359	2,687	2,205	2,169	2,204
Surface Technologies	5,457	5,947	5,446	5,892	5,333	5,631	5,047	5,189
Nutrition & Care	1,971	1,533	2,074	1,584	2,123	1,598	1,898	1,727
Agricultural Solutions	3,397	2,846	2,459	1,963	2,142	1,593	2,282	1,760
Other	940	783	1,142	793	1,153	976	1,133	1,113
BASF Group	23,083	19,400	22,974	19,753	21,946	19,669	19,323	19,776

Contributions to total sales by segment in 2022**Income from operations (EBIT) before special items^a**

Million €

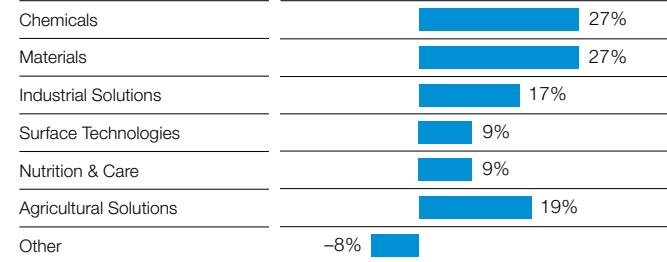
	Q1		Q2		Q3		Q4	
	2022	2021	2022	2021	2022	2021	2022	2021
Chemicals	858	586 ^b	853	1,018 ^b	323	878 ^b	-79	610 ^b
Materials	751	672	668	792	277	631	144	323
Industrial Solutions	348	266	323	307	299	262	120	171
Surface Technologies	267	360	227	289	239	119	170	32
Nutrition & Care	244	218	213	138	180	104	-19	37
Agricultural Solutions	868	807	223	75	7	-90	122	-77
Other	-518	-589 ^b	-168	-263 ^b	22	-39 ^b	-85	131 ^b
BASF Group	2,818	2,321	2,339	2,355	1,348	1,865	373	1,227

Contributions to EBIT before special items by segment in 2022^a Quarterly results not audited^b Adjusted figures (see footnote b on page 69)

Income from operations (EBIT)^a

Million €

	Q1		Q2		Q3		Q4	
	2022	2021	2022	2021	2022	2021	2022	2021
Chemicals	857	633 ^b	851	1,010 ^b	322	877 ^b	-272	595 ^b
Materials	749	648	650	762	272	620	105	315
Industrial Solutions	343	259	310	340	309	229	135	136
Surface Technologies	260	356	81	289	197	104	75	12
Nutrition & Care	246	215	209	194	178	105	-28	40
Agricultural Solutions	863	804	210	35	-1	-44	149	-99
Other	-534	-604 ^b	40	-315 ^b	17	-68 ^b	-46	228 ^b
BASF Group	2,785	2,311	2,350	2,316	1,294	1,822	119	1,227

^a Quarterly results not audited^b Adjusted figures (see footnote b on page 69)**Contributions to EBIT by segment in 2022**



Neopentyl glycol ZeroPCF¹

Since 2022, BASF has offered the versatile intermediate neopentyl glycol (NPG) as a ZeroPCF variant, i.e., with a Product Carbon Footprint (PCF) of net zero.¹ We achieve this through a production process that combines our biomass balance approach with the use of renewable energies and the advantages of our Verbund production system. NPG ZeroPCF has the same quality as our conventionally manufactured NPG and therefore serves as a drop-in solution for our customers to achieve their emission and sustainability targets. A key application area for NPG is powder coatings, primarily used in the construction industry and for household appliances. There, they enable a reduction of volatile organic compounds (VOC) by up to 50%. NPG ZeroPCF is currently produced at the Verbund site in Ludwigshafen, Germany, and is available worldwide.

Discover NPG ZeroPCF at basf.com/en/npg

Chemicals

The Chemicals segment consists of the Petrochemicals and Intermediates divisions. It supplies the other segments with basic chemicals and intermediates, contributing to the organic growth of our key value chains. Alongside internal transfers, our customers mainly come from the chemical and plastics industries. We aim to further expand our competitiveness through technological leadership and operational excellence.

For more information on the Chemicals segment's business model, see page 32 onward

Sales

€14,895 million

2021: €13,579 million

EBIT before special items

€1,956 million

2021: €3,092 million

¹ Cradle-to-gate calculation (from raw materials extraction to the factory gate)

Business review**At a glance**

- Sales in both operating divisions considerably above prior-year level
- Strong decrease in EBIT before special items due to lower margins and volumes as well as higher fixed costs

The Chemicals segment increased **sales to third parties** by €1,316 million compared with the previous year to €14,895 million. The Petrochemicals division recorded sales of €10,546 million, €871 million higher than in the previous year. The Intermediates division increased sales by €445 million to €4,349 million.

Factors influencing sales – Chemicals

	Chemicals	Petrochemicals	Intermediates
Volumes	-10.6%	-9.8%	-12.7%
Prices	15.2%	13.6%	19.0%
Portfolio	-0.1%	-0.1%	-0.1%
Currencies	5.2%	5.3%	5.2%
Sales	9.7%	9.0%	11.4%

The positive sales development was primarily the result of significantly higher prices. This was mainly attributable to sharp increases in prices for raw materials and energy. Price increases in the first half of 2022 were also driven by strong demand and supply chain disruptions, particularly in China as a result of the strict zero-COVID policy. In this market environment, the Petrochemicals division raised prices in all business areas, especially for steam cracker products, styrene monomers and in the propylene value chain. Intermediates mainly raised prices in the amines business. By contrast, following price increases in early 2022, the butanediol and derivatives business recorded a significant decline in prices in the second half of the year, particularly in Asia. This primarily reflected a significant slowdown in demand.

Segment data – Chemicals

Million €

		2022	2021	+/-
Sales to third parties		14,895	13,579	9.7%
of which Petrochemicals		10,546	9,674	9.0%
Intermediates		4,349	3,904	11.4%
Intersegment transfers		4,860	4,269	13.8%
Sales including transfers		19,754	17,848	10.7%
Income from operations before depreciation, amortization and special items ^a		2,774	3,842	-27.8%
Income from operations before depreciation and amortization (EBITDA) ^a		2,771	3,882	-28.6%
EBITDA margin	%	18.6	28.6	-
Depreciation and amortization ^b		1,013	767	32.1%
Income from operations (EBIT) ^a		1,758	3,115	-43.6%
Special items		-198	23	.
EBIT before special items ^a		1,956	3,092	-36.7%
Return on capital employed (ROCE) ^a	%	15.6	33.9	-
Assets ^c		10,481	10,482	0.0%
Investments including acquisitions ^c		1,701	1,157	47.0%
Research and development expenses		93	97	-4.1%

a BASF's ethylene value chain was reorganized internally as of January 1, 2022. In this connection, the polyolefins and styrenics businesses of the joint venture BASF-YPC Company Ltd., Nanjing, China, which were previously reported under Other, were allocated to the Petrochemicals division. The prior-year figures have been adjusted. This reduced income from integral companies accounted for using the equity method, EBITDA before special items, EBITDA, EBIT and EBIT before special items in Other by €118 million in 2021 and increased these indicators in the Petrochemicals division accordingly. The operating assets were also reallocated as part of the reorganization and increased the Chemicals segment's assets by €114 million as of December 31, 2021.

b Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

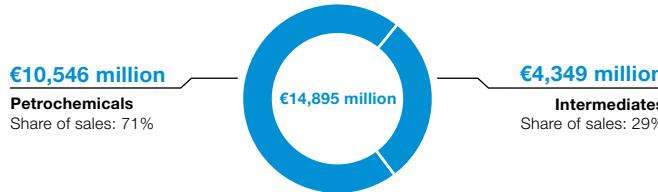
c Additions to property, plant and equipment and intangible assets

Sales growth was supported by positive currency effects, primarily relating to the U.S. dollar.

Sales in both operating divisions were reduced by significantly lower volumes due to weaker demand, especially in the second half of the year. The Petrochemicals division recorded lower volumes, especially for steam cracker products, in the propylene value chain and for styrene monomers. In the Intermediates division, sales volumes declined in the butanediol and derivatives business in particular.

Chemicals – sales

By division



The segment's **income from operations (EBIT) before special items** declined by €1,136 million to €1,956 million. Both operating divisions recorded a considerable decline in earnings compared with the exceptionally strong previous year. EBIT before special items in the Petrochemicals division decreased mainly as a result of lower margins and volumes, as well as a lower contribution from shareholdings accounted for using the equity method. The Intermediates division's earnings were below the prior-year level, primarily due to higher fixed costs. The main drivers here were higher energy prices, inflation and currency effects.

At €1,758 million, **EBIT** was €1,357 million lower than in 2021. This included special charges, mainly for the impairment of a plant in Ludwigshafen, Germany.

For the outlook for 2023, see page 154 onward

Division sales by region

(Location of customer)

Divisions	Europe	North America	Asia Pacific	South America, Africa, Middle East	Total (million €)
Petrochemicals	60%	27%	8%	5%	10,546
Intermediates	40%	20%	37%	3%	4,349

Divisions, products, applications

	Products	Customer industries and applications
Petrochemicals	Ethylene, propylene, butadiene, benzene, alcohols, solvents, plasticizers, alkylene oxides, glycols, acrylic monomers, styrene and polystyrene, styrenic foams, superabsorbents	Chemical, plastics, construction, detergent, hygiene, automotive, packaging and textile industries; production of paints, coatings, cosmetics, oilfield and paper chemicals Use in the BASF Verbund
Intermediates	Basic products: butanediol and derivatives, alkylamines and alkanolamines, neopentyl glycol, formic and propionic acid Specialties: specialty amines such as tertiary butylamine and polyetheramine, gas treatment chemicals, vinyl monomers, acid chlorides, chloroformates, chiral intermediates	Chemical, plastics, coatings, construction, automotive, wind energy, pharmaceutical and agricultural industries; production of detergents and cleaners, textile fibers, cosmetics, oilfield and paper chemicals Use in the BASF Verbund

Production capacities of selected products in the regions^a

Product	Europe	North America	Asia Pacific	South America, Africa, Middle East	Annual capacity (metric tons)
Acrylic acid	■	■	■	■	1,510,000
Alkylamines	■	■	■		250,000
Formic acid	■	■	■		305,000
Benzene	■	■	■		910,000
Butadiene	■	■	■		680,000
Butanediol equivalents	■	■	■		550,000
Ethanolamines and derivatives	■		■		440,000
Ethylene	■	■	■		3,480,000
Ethylene oxide	■	■	■		1,445,000
Neopentyl glycol	■	■	■		255,000
Oxo-C4 alcohols (calculated as butyraldehyde)	■	■	■		1,625,000
PolyTHF®	■	■	■		350,000
Propionic acid	■		■		180,000
Propylene	■	■	■		2,680,000
Styropor®/Neopor®	■		■		545,000
Superabsorbents	■	■	■	■	585,000
Plasticizers	■	■			595,000

^a All capacities are included at 100%, including plants belonging to joint operations and joint ventures.



Fast-charging stations made from BASF plastics

Together with our partner Ebusbar^{®1} we have developed a fast-charging station for electric cars made of the BASF plastics Ultramid[®] PA, Ultramid[®] Advanced PPA, Ultradur[®] PBT and Elastollan[®] TPU. These high-performance materials are ideally suited for fast chargers as they exhibit excellent mechanical performance and high dimensional stability even under high current and elevated temperatures. To support the rapid growth of the global electromobility market, expansion of the charging infrastructure is essential. BASF expects growth in this segment to outpace the global electromobility market over the next five years and is targeting annual sales of more than €30 million for performance plastics from 2027 onward.

[Discover BASF's eMobility plastics at \[emobility-plastics.basf.com\]\(http://emobility-plastics.basf.com\)](#)

Materials

The Materials segment comprises the Performance Materials and Monomers divisions. The segment's portfolio includes advanced materials and their precursors for new applications and systems such as isocyanates, polyamides and inorganic basic products, as well as specialties for plastics and plastics processing industries. We differentiate ourselves through specific technology expertise, industry knowledge and customer proximity, and create maximum value in the isocyanate and polyamide value chains.

For more information on the Materials segment's business model, see page 32 onward

Sales

€18,443 million

2021: €15,214 million

EBIT before special items

€1,840 million

2021: €2,418 million

¹ Ebusbar is headquartered in Shenzhen, China and specializes in high voltage connection system solutions for new energy vehicles.

Business review**At a glance**

- Segment sales growth of 21.2% mainly driven by higher prices
- EBIT before special items considerably lower in both operating divisions

The Materials segment increased **sales to third parties** by €3,229 million year on year to €18,443 million in 2022, with both operating divisions contributing. Sales in the Monomers division rose by €1,954 million to €9,877 million. In the Performance Materials division, sales were €1,275 million higher at €8,567 million.

Factors influencing sales – Materials

	Materials	Performance Materials	Monomers
Volumes	-5.7%	-2.3%	-8.7%
Prices	21.3%	14.1%	28.0%
Portfolio	-0.1%	0.0%	-0.2%
Currencies	5.6%	5.7%	5.6%
Sales	21.2%	17.5%	24.7%

Sales growth was primarily driven by significantly higher prices as a result of the jump in raw materials prices. The Monomers division raised prices in all business areas, especially in the ammonia value chain. The Performance Materials division mainly raised prices for polyurethane systems and engineering plastics in Europe and North America.

Currency effects, mostly relating to the U.S. dollar and the Chinese renminbi, had a clearly positive impact on sales development in both divisions.

Segment data – Materials

Million €

		2022	2021	+/-
Sales to third parties		18,443	15,214	21.2%
of which Performance Materials		8,567	7,292	17.5%
Monomers		9,877	7,922	24.7%
Intersegment transfers		1,742	1,250	39.4%
Sales including transfers		20,186	16,464	22.6%
Income from operations before depreciation, amortization and special items		2,686	3,208	-16.3%
Income from operations before depreciation and amortization (EBITDA)		2,660	3,162	-15.9%
EBITDA margin	%	14.4	20.8	-
Depreciation and amortization ^a		884	817	8.2%
Income from operations (EBIT)		1,776	2,345	-24.3%
Special items		-63	-73	13.3%
EBIT before special items		1,840	2,418	-23.9%
Return on capital employed (ROCE)	%	14.9	22.8	-
Assets		10,864	11,286	-3.7%
Investments including acquisitions ^b		880	709	24.1%
Research and development expenses		201	193	4.0%

a Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

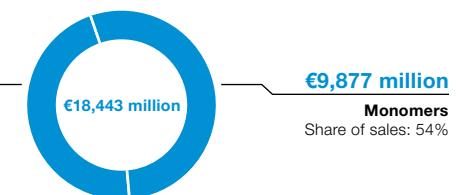
b Additions to property, plant and equipment and intangible assets

Significantly lower volumes on the back of declining demand over the course of the year had an offsetting effect. In the Monomers division, sales volumes decreased mainly in Europe for methylene diphenyl isocyanate (MDI), propylene oxides and polyols, and polyamide 6.6. Volumes in the Performance Materials division decreased in Asia Pacific and Europe in particular due to weaker demand from the consumer goods industry. Customer demand from the European construction industry also declined.

Materials – sales

By division

€8,567 million
Performance Materials
Share of sales: 46%



€18,443 million
Monomers
Share of sales: 54%

At €1,840 million, **income from operations (EBIT) before special items** was €579 million below the 2021 figure. EBIT before special items declined considerably in both operating divisions, especially in the Monomers division due to lower MDI and polyamide 6.6 margins. The decline in earnings in the Performance Materials division was driven by lower volumes and higher fixed costs caused by currency effects, inflation and higher manufacturing costs. This could only be partially offset by higher margins.

EBIT decreased by €569 million to €1,776 million. This included special charges of €66 million, largely from changes to the production network for thermoplastic polyurethanes and the discontinuation of our business activities in Russia.

 For the outlook for 2023, see page 154 onward

Division sales by region

(Location of customer)

Divisions	Europe	North America	Asia Pacific	South America, Africa, Middle East	Total (million €)
Performance Materials	37%	23%	35%	5%	8,567
Monomers	49%	21%	25%	5%	9,877

Divisions, products, applications

	Products	Customer industries and applications
Performance Materials	Engineering plastics, biodegradable plastics, foam specialties, polyurethanes	Automotive, electrical engineering, packaging, footwear, sports and leisure, furniture, household, mechanical engineering, construction, thermal insulation, agriculture, medical technology, renewable energies
Monomers	Isocyanates (MDI, TDI), ammonia, caprolactam, adipic acid, chlorine, urea, glues and impregnating resins, caustic soda, polyamides 6 and 6.6, standard alcohols, sulfuric and nitric acid	Industries such as plastics, woodworking, furniture, packaging, textile, construction and automotive Use in the BASF Verbund

Production capacities of selected products in the regions^a

Product	Europe	North America	Asia Pacific	South America, Africa, Middle East	Annual capacity (metric tons)
Ammonia	■	■			1,765,000
Chlorine	■				595,000
Urea	■				545,000
Isocyanates	■	■	■		2,700,000
Polyamides 6 and 6.6	■	■	■		925,000
Polyamide precursors	■	■	■		1,420,000
Propylene oxide	■				675,000
Sulfuric acid	■				920,000

^a All capacities are included at 100%, including plants belonging to joint operations and joint ventures.



Innovative chemistry at nanoscale:

Modern semiconductor nodes usually measure less than five nanometers. Shrinking logic chip size presents unique challenges for leading semiconductor manufacturers to clean extremely thin metal layers in small three-dimensional structures. BASF is the first chemical company to develop wafer cleaning products that make use of a new nanoscale kinetic control mechanism to solve this problem. In this way, we support our customers in the mass production of three-nanometer integrated circuit chips. BASF expects these products to generate annual sales growth of over 15% between 2022 and 2027. The cleaning products are also recyclable, reducing chemical waste and packaging consumption by more than 50% compared with traditional single-use solutions.

 Discover innovative chemistry for semiconductors at bASF.com/semiconductors

Industrial Solutions

The Industrial Solutions segment consists of the Dispersions & Resins and the Performance Chemicals divisions. It develops and markets ingredients and additives for industrial applications, such as polymer dispersions, resins, additives, electronic materials and antioxidants. We aim to grow organically in key industries such as automotive, plastics, paints and coatings, electronics, and energy and resources, and expand our position by leveraging our comprehensive industry expertise and application know-how.

 For more information on the Industrial Solutions segment's business model, see page 32 onward

Sales

€9,992 million

2021: €8,876 million

EBIT before special items

€1,091 million

2021: €1,006 million

Business review

At a glance

- Considerable sales increase due to higher prices and currency effects
- EBIT before special items rose by €85 million due to earnings growth in the Performance Chemicals division

Sales to third parties in the Industrial Solutions segment rose by €1,116 million in 2022 to €9,992 million. This was attributable to considerably higher sales in both operating divisions. The Performance Chemicals division increased sales by €778 million to €3,973 million. Sales in the Dispersions & Resins division rose by €338 million to €6,019 million.

Factors influencing sales – Industrial Solutions

	Industrial Solutions	Dispersions & Resins	Performance Chemicals
Volumes	-3.4%	-5.2%	-0.3%
Prices	16.0%	14.1%	19.3%
Portfolio	-5.9%	-8.5%	-1.5%
Currencies	6.0%	5.5%	6.9%
Sales	12.6%	6.0%	24.3%

Sales growth was mainly due to higher prices in all business areas and regions, passing on increased prices for raw materials.

The positive sales development was also supported by currency effects, largely from the U.S. dollar and the Chinese renminbi.

Segment data – Industrial Solutions

Million €

	2022	2021	+/-
Sales to third parties	9,992	8,876	12.6%
of which Dispersions & Resins	6,019	5,681	6.0%
Performance Chemicals	3,973	3,195	24.3%
Intersegment transfers	507	420	20.7%
Sales including transfers	10,499	9,296	12.9%
Income from operations before depreciation, amortization and special items	1,437	1,343	7.0%
Income from operations before depreciation and amortization (EBITDA)	1,443	1,344	7.4%
EBITDA margin	%	14.4	15.1
Depreciation and amortization ^a		346	380
Income from operations (EBIT)	1,097	965	13.7%
Special items	6	-42	.
EBIT before special items	1,091	1,006	8.4%
Return on capital employed (ROCE)	%	16.0	15.2
Assets	6,318	6,302	0.2%
Investments including acquisitions ^b	322	361	-10.8%
Research and development expenses	172	175	-1.5%

^a Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

^b Additions to property, plant and equipment and intangible assets

In the Dispersions & Resins division, portfolio effects in particular had a significant offsetting effect, primarily from the disposal of the global pigments business as of June 30, 2021. The Performance Chemicals division recorded slightly negative portfolio effects, mainly due to the divestiture of the kaolin minerals business effective September 30, 2022.

The segment's sales development was also dampened by slightly lower volumes. Lower demand reduced volumes in both operating divisions.

Industrial Solutions – sales

By division



The segment's **income from operations (EBIT) before special items** rose slightly compared with the previous year. This was attributable to earnings growth in the Performance Chemicals division, largely from higher margins due to price increases. By contrast, EBIT before special items was slightly lower in the Dispersions & Resins division. This was mainly attributable to the sale of the global pigments business, lower volumes and higher fixed costs. This could only be partially offset by price-driven margin growth.

EBIT rose by €132 million compared with 2021 to €1,097 million. This included special income from the divestiture of the production site in Quincy, Florida, and the associated attapulgite business. Special charges resulted mainly from the discontinuation of our business activities in Russia.

 For the outlook for 2023, see page 154 onward

Division sales by region

(Location of customer)

Divisions	Europe	North America	Asia Pacific	South America, Africa, Middle East	Total (million €)
Dispersions & Resins	38%	26%	29%	7%	6,019
Performance Chemicals	36%	26%	26%	12%	3,973

Divisions, products, applications

	Products	Customer industries and applications
Dispersions & Resins	Polymer dispersions, resins, additives, electronic materials	Paints and coatings, construction, paper, printing and packaging, adhesives and electronics industries
Performance Chemicals	Antioxidants, light stabilizers and flame retardants for plastic applications Fuel and refinery additives, polyisobutene, brake fluids and engine coolants, lubricant additives and basestocks, components for metalworking fluids and compounded lubricants Process chemicals for the extraction of oil, gas, metals and minerals; chemicals for enhanced oil recovery	Chemicals, plastics, consumer goods, automotive and transportation industries, as well as energy and resources
	Kaolin minerals ^a	

^a The kaolin minerals business was sold on September 30, 2022.

Production capacities of selected products in the regions^a

Product	Europe	North America	Asia Pacific	South America, Africa, Middle East	Annual capacity (metric tons)
Acrylics dispersions	■	■	■	■	1,839,000
Formulation additives	■	■	■	■	69,000
Polyisobutene	■		■	■	265,000

^a All capacities are included at 100%, including plants belonging to joint operations and joint ventures.



StarBloc®

StarBloc® is a continuously developed thin-film primer technology from BASF that can make a significant contribution to more efficient, sustainable and profitable automotive coatings. StarBloc® enables paint to be applied with a reduced film thickness of just 20 µm instead of 30 µm. It also offers advantages in the application process, such as a reduced number of application robots, which also saves solvents and cleaning efforts. This means that automotive manufacturers can save a third of the materials required compared with a standard series primer. For OEMs, lower material consumption also leads to a reduction in their CO₂ emissions and lower logistics costs. These environmental and process advantages are convincing automotive manufacturers around the world to switch to StarBloc®. BASF therefore expects annual sales of this product to increase fivefold to more than €20 million as early as 2023 compared with baseline 2021.

[Discover StarBloc® at *coatings.bASF.com*](http://coatings.bASF.com)

Surface Technologies

The Surface Technologies segment comprises the Catalysts and Coatings divisions, which offer chemical solutions for surfaces. Its portfolio serves industries such as the automotive and chemical sectors and includes automotive OEM and refinish coatings, surface treatment, catalysts, battery materials and precious and base metal services. We improve our customers' applications and processes with tailored products, technologies and solutions, and support them through geographical proximity across all regions. The aim is to drive BASF's growth by leveraging our portfolio of technologies and expanding our position as a leading and innovative provider of battery materials and surface coatings solutions.

 For more information on the Surface Technologies segment's business model, see page 32 onward

Sales

€21,283 million

2021: €22,659 million

EBIT before special items

€902 million

2021: €800 million

Business review**At a glance**

- Considerable sales decrease due to lower volumes and prices
- Considerable growth in EBIT before special items in both operating divisions

Sales to third parties in the Surface Technologies segment declined by €1,376 million compared with the previous year to €21,283 million. Sales growth of €780 million to €4,220 million in the Coatings division was unable to compensate for the considerable decrease in the Catalysts division, where sales declined by €2,157 million to €17,062 million.

Factors influencing sales – Surface Technologies

	Surface Technologies	Catalysts	Coatings
Volumes	-13.0%	-16.2%	5.1%
Prices	-2.7%	-5.4%	12.4%
Portfolio	3.4%	4.1%	-0.8%
Currencies	6.3%	6.3%	6.0%
Sales	-6.1%	-11.2%	22.7%

The segment's sales decrease was mainly attributable to significantly lower volumes in the Catalysts division's precious metal trading business. Volume growth in the chemical and refinery catalysts businesses was unable to compensate for this. Sales volumes were significantly higher in the Coatings division, mainly due to improved supply chain conditions in North America and the government stimulus program in China.

Segment data – Surface Technologies

Million €

	2022	2021	+/-
Sales to third parties	21,283	22,659	-6.1%
of which Catalysts	17,062	19,219	-11.2%
Coatings	4,220	3,440	22.7%
Intersegment transfers	198	171	15.6%
Sales including transfers	21,481	22,831	-5.9%
Income from operations before depreciation, amortization and special items	1,464	1,277	14.6%
Income from operations before depreciation and amortization (EBITDA)	1,264	1,243	1.6%
EBITDA margin	%	5.9	5.5
Depreciation and amortization ^a	651	483	35.0%
Income from operations (EBIT)	612	761	-19.5%
Special items	-290	-39	-637.1%
EBIT before special items	902	800	12.7%
Return on capital employed (ROCE)	%	3.9	5.6
Assets	14,899	13,769	8.2%
Investments including acquisitions ^b	740	1,469	-49.6%
Research and development expenses	335	296	13.1%

^a Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

^b Additions to property, plant and equipment and intangible assets

The sharp decline in precious metal prices had a negative impact on sales. At €12,336 million, sales in precious metal trading and precious metal sales in the automotive catalysts business¹ were considerably below the prior-year figure (€15,726 million) due to lower volumes and prices. Significant price increases across all business areas in the Coatings division, particularly in Europe and in the region South America, Africa, Middle East, were unable to compensate for this.

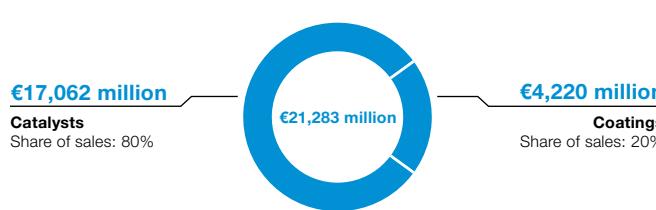
Currency effects, largely relating to the U.S. dollar and the Chinese renminbi, had a positive impact on sales.

Portfolio effects in the Catalysts division following the acquisition of a majority shareholding in BASF Shanshan Battery Materials on August 31, 2021, also had a positive impact on sales.

¹ Sales, volume growth, EBITDA before special items and the EBITDA margin before special items excluding precious metals for the BASF Group and for the Surface Technologies segment are presented under Selected Key Figures Excluding Precious Metals on page 294.

Surface Technologies – sales

By division



Income from operations (EBIT) before special items rose by €102 million to €902 million. This was driven by considerable earnings growth in both operating divisions. The increase in EBIT before special items in the Catalysts division was largely attributable to higher earnings contributions from the automotive catalysts and battery materials businesses. In the Coatings division, EBIT before special items increased mainly as a result of higher prices in all regions and higher volumes, especially in the automotive OEM coatings business. This more than offset increases in raw materials prices and fixed costs, primarily due to inflation and higher energy costs.

At €612 million, **EBIT** was €148 million below the prior-year figure. EBIT in 2022 included special charges, mainly for impairments in connection with the agreed divestiture of the production site in De Meern, Netherlands. Other special charges mainly related to the carve-out of the newly established BASF Environmental Catalyst and Metal Solutions unit within the Catalysts division and the integration of the acquired BASF Shanshan companies.

For the outlook for 2023, see page 154 onward

Division sales by region

(Location of customer)

Divisions	Europe	North America	Asia Pacific	South America, Africa, Middle East	Total (million €)
Catalysts	26%	33%	36%	5%	17,062
Coatings	30%	25%	27%	18%	4,220

Divisions, products, applications

	Products	Customer industries and applications
Catalysts	Automotive catalysts, process catalysts and technologies, battery materials, precious and base metal services	Automotive, chemical and pharmaceutical industries, refineries, battery manufacturers
Coatings	Coatings solutions for automotive applications, technology and system solutions for surface treatments, decorative paints	Solutions for the protection of air quality as well as the production of fuels, chemicals, plastics and battery materials, battery material recycling Automotive industry, body shops, steel industry, aviation, aluminum applications in the architecture and construction industries, household appliances, painting businesses and private consumers



Texapon® SFA

Texapon® SFA is a very mild, innovative and sustainable anionic surfactant. It is 99% derived from renewable feedstocks, certified as sustainable according to the RSPO mass balance standard, readily biodegradable and suitable as an alternative to sulfate-based surfactants. The product is extremely gentle on the skin and eyes, making it especially suitable for delicate baby skin and formulas for tear-free shampoo products. When added to polymer-free shampoo formulations, for example, Texapon® SFA makes it easier to comb hair. It has also been proven to reinforce the beneficial effect of formulations with cationic polymers. BASF aims to achieve annual sales of over €20 million with this product.

[Discover Texapon® SFA at carecreations.bASF.com](http://carecreations.bASF.com)

Nutrition & Care

The Nutrition & Care segment, consisting of the Care Chemicals and Nutrition & Health divisions, serves the growing needs of food and feed producers as well as the pharmaceutical, cosmetics, detergents and cleaners industries. We offer solutions for the increasingly sophisticated demands of fast-moving consumer goods, as well as for technical applications, crop protection and nutrition. We strive to expand our position as a leading provider of ingredients for consumer goods in the areas of nutrition, home and personal care. Our goal is to drive strong organic growth. We focus on growth markets, sustainability trends, and digital business models in consumer markets.

For more information on the Nutrition & Care segment's business model, see page 32 onward

Sales

€8,066 million

2021: €6,442 million

EBIT before special items

€618 million

2021: €497 million

Business review**At a glance**

- Sales increase of 25.2% mainly driven by higher prices
- EBIT before special items 24.3% higher due to considerable earnings growth in the Care Chemicals division

Sales to third parties in the Nutrition & Care segment rose by €1,624 million to €8,066 million in 2022. This was primarily attributable to the Care Chemicals division, which recorded sales growth of €1,180 million to €5,619 million. In the Nutrition & Health division, sales rose by €444 million to €2,447 million.

Factors influencing sales – Nutrition & Care

	Nutrition & Care	Care Chemicals	Nutrition & Health
Volumes	-1.4%	-4.1%	4.7%
Prices	23.3%	27.9%	13.1%
Portfolio	-1.2%	-1.2%	-1.3%
Currencies	4.5%	4.0%	5.7%
Sales	25.2%	26.6%	22.2%

The segment's positive sales performance was mainly due to higher prices in all business areas, primarily resulting from cost increases for raw materials and energy.

Positive currency effects, largely relating to the U.S. dollar and the Chinese renminbi, had a positive impact on sales.

Volumes were slightly lower overall, dampening the segment's sales performance. This was driven by the decline in volumes in the Care Chemicals division. Here, higher volumes in the personal care solutions business only partially compensated for the volumes decrease in the remaining business areas.

Segment data – Nutrition & Care

Million €

	2022	2021	+/-
Sales to third parties	8,066	6,442	25.2%
of which Care Chemicals	5,619	4,439	26.6%
Nutrition & Health	2,447	2,003	22.2%
Intersegment transfers	588	491	19.8%
Sales including transfers	8,654	6,933	24.8%
Income from operations before depreciation, amortization and special items	1,067	909	17.4%
Income from operations before depreciation and amortization (EBITDA)	1,055	967	9.1%
EBITDA margin	%	13.1	15.0
Depreciation and amortization ^a		450	413
Income from operations (EBIT)	605	554	9.3%
Special items	-13	57	.
EBIT before special items	618	497	24.3%
Return on capital employed (ROCE)	%	7.5	8.2
Assets	8,038	7,231	11.2%
Investments including acquisitions ^b	642	654	-1.8%
Research and development expenses	172	172	-0.3%

^a Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

^b Additions to property, plant and equipment and intangible assets

The Nutrition & Health division increased volumes, especially in the animal nutrition and pharmaceutical business areas. Lower volumes in the aroma ingredients business had an offsetting effect.

Portfolio effects from the sale of the production site in Kankakee, Illinois, as of May 31, 2021, had a negative impact on sales in both operating divisions.

Nutrition & Care – sales

By division

€5,619 million
Care Chemicals
Share of sales: 70%

€2,447 million
Nutrition & Health
Share of sales: 30%

Income from operations (EBIT) before special items rose by €121 million to €618 million year on year. This was due to the strong increase in earnings in the Care Chemicals division, mainly from price-driven margin growth. Higher fixed costs, largely as a result of inflation and currency effects, was an offsetting factor. By contrast, EBIT before special items in the Nutrition & Health division was considerably below the prior-year level. This was primarily attributable to higher costs, largely from increased energy costs and turnarounds.

EBIT rose by €52 million compared with the previous year to €605 million. It included special charges for the restructuring of the Nutrition & Health division and for the discontinuation of our business activities in Russia. In the previous year, EBIT included special income from the sale of the production site in Kankakee, Illinois.

 For the outlook for 2023, see page 154 onward

Division sales by region

(Location of customer)

Divisions	Europe	North America	Asia Pacific	South America, Africa, Middle East	Total (million €)
Care Chemicals	53%	18%	20%	9%	5,619
Nutrition & Health	37%	19%	33%	11%	2,447

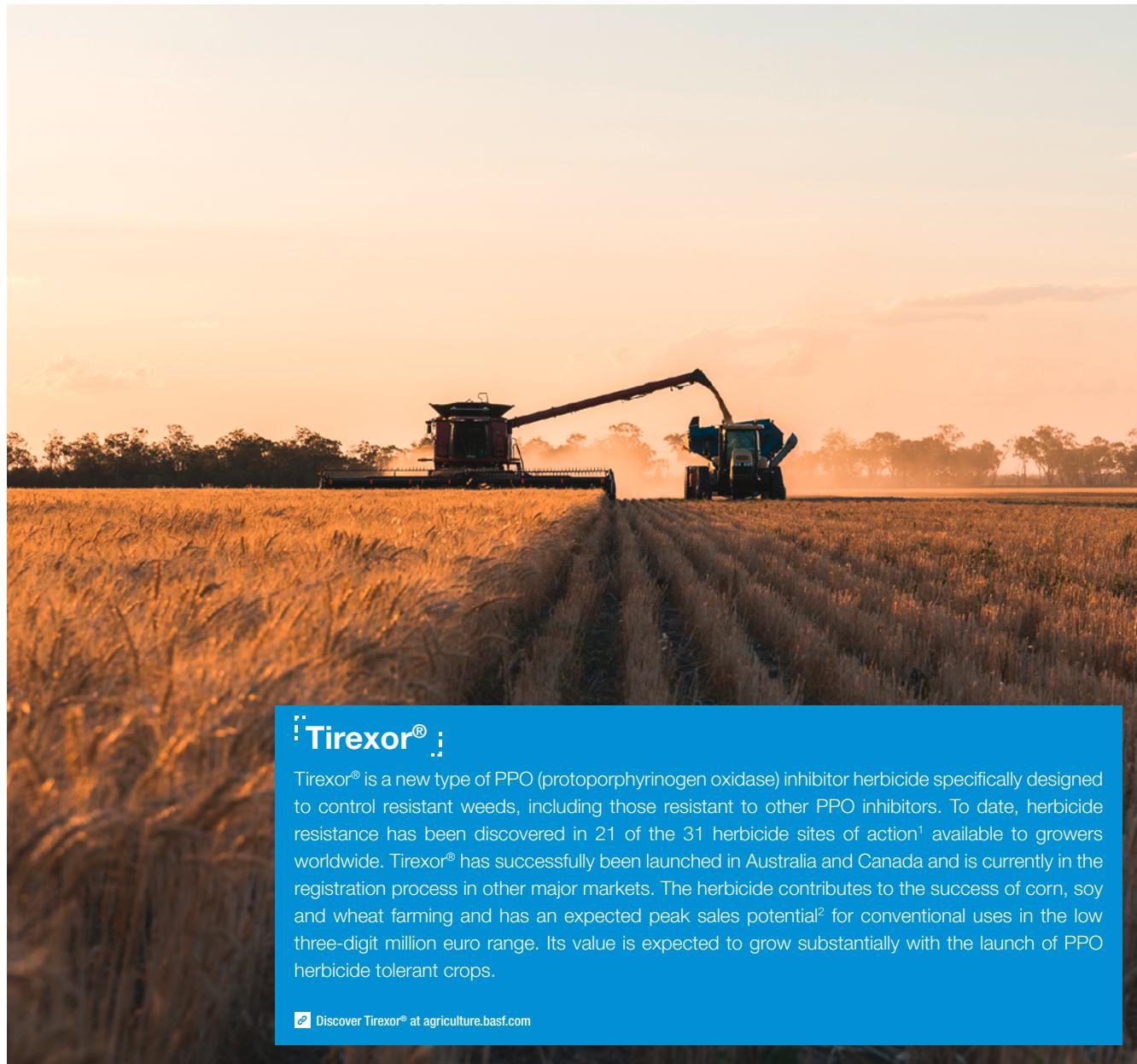
Divisions, products, applications

	Products	Customer industries and applications
Care Chemicals	Ingredients for skin and hair cleansing and care products, such as emollients, cosmetic active ingredients, polymers and UV filters	Cosmetics, detergent and cleaner industry, agrochemical industry, technical applications for various industries
	Solutions and ingredients for detergents and cleaners in household, institutions or industry, such as surfactants, enzymes, chelating agents, water-soluble polymers, biocides and products for optical effects	
	Chemical ingredients and processing additives, for example for crop protection, excipients for chemical processes such as emulsion polymerization, metal surface treatments or textile processing, as well as products for concrete additives, biofuels and other industrial applications	
Nutrition & Health	Additives for the food and feed industries, such as vitamins, carotenoids, sterols, enzymes, emulsifiers, omega-3 fatty acids	Food and feed industries, flavor and fragrance industry, pharmaceutical industry and bioethanol industry
	Industrial enzymes for bioethanol and food production, natural and synthetic flavors and fragrances, such as citral, geraniol, citronellol, L-menthol and linalool, Isobionics® Santalol, valencene and nootkatone	
	Excipients for the pharmaceutical industry and selected, high-volume active pharmaceutical ingredients, such as ibuprofen and omega-3 fatty acids	

Production capacities of selected products in the regions^a

Product	Europe	North America	Asia Pacific	South America, Africa, Middle East	Annual capacity (metric tons)
Anionic surfactants					550,000
Citral					78,000
Chelating agents					170,000
Methane sulfonic acid					50,000
Nonionic surfactants					650,000

^a All capacities are included at 100%, including plants belonging to joint operations and joint ventures.



Tirexor®

Tirexor® is a new type of PPO (protoporphyrinogen oxidase) inhibitor herbicide specifically designed to control resistant weeds, including those resistant to other PPO inhibitors. To date, herbicide resistance has been discovered in 21 of the 31 herbicide sites of action¹ available to growers worldwide. Tirexor® has successfully been launched in Australia and Canada and is currently in the registration process in other major markets. The herbicide contributes to the success of corn, soy and wheat farming and has an expected peak sales potential² for conventional uses in the low three-digit million euro range. Its value is expected to grow substantially with the launch of PPO herbicide tolerant crops.

[Discover Tirexor® at agriculture.bASF.com](#)

Agricultural Solutions

In the Agricultural Solutions segment, we aim to further strengthen our market position as an integrated provider. Our offer comprises seeds and seed treatment products, as well as fungicides, herbicides, insecticides and biological solutions, complemented by digital farming solutions to help farmers achieve a better yield. Our strategy is based on innovation-driven organic growth and targeted portfolio expansion through acquisitions. Customer needs, societal expectations and reducing environmental impacts are what motivate us to innovate.

For more information on the Agricultural Solutions segment's business model, see page 32 onward

Sales

€10,280 million

2021: €8,162 million

EBIT before special items

€1,220 million

2021: €715 million

¹ International herbicide-resistant weed database

² Peak sales are the highest sales value to be expected from one year. For more information, see the Glossary on page 295.

Business review**At a glance**

- Sales of €10,280 million, considerably above the prior year due to higher prices, positive currency effects and volume growth
- EBIT before special items of €1,220 million, 70.6% above the 2021 figure

Sales to third parties in the Agricultural Solutions segment were €10,280 million in 2022, €2,118 million above the previous year. Higher prices in all regions contributed most to the positive development. Sales growth was also driven by exchange rate effects and higher volumes.

Factors influencing sales – Agricultural Solutions

Volumes	5.7%
Prices	12.4%
Portfolio	-0.6%
Currencies	8.4%
Sales	25.9%

In **Europe**, sales rose by €302 million year on year to €2,430 million. This was mainly due to significantly higher price levels. Sales development was supported by strong volume growth, especially in fungicides and herbicides, while negative currency effects, mainly from the Turkish lira, had a dampening effect.

In **North America**, sales rose by €922 million to €4,007 million. This was primarily driven by significantly higher prices and positive currency effects. Sales were also boosted by higher herbicide volumes in particular.

Segment data – Agricultural Solutions

Million €

	2022	2021	+/-
Sales to third parties	10,280	8,162	25.9%
Intersegment transfers	40	40	1.4%
Sales including transfers	10,320	8,202	25.8%
Income from operations before depreciation, amortization and special items	1,928	1,375	40.2%
Income from operations before depreciation and amortization (EBITDA)	1,922	1,358	41.6%
EBITDA margin %	18.7	16.6	–
Depreciation and amortization ^a	701	662	5.9%
Income from operations (EBIT)	1,221	696	75.5%
Special items	1	-19	.
EBIT before special items	1,220	715	70.6%
Return on capital employed (ROCE) %	7.1	4.5	–
Assets	17,071	15,305	11.5%
Investments including acquisitions ^b	414	347	19.0%
Research and development expenses	944	904	4.4%

^a Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

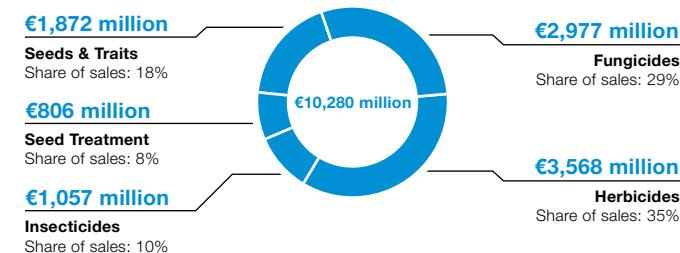
^b Additions to property, plant and equipment and intangible assets

Sales in **Asia** amounted to €1,130 million, an increase of €172 million compared with the previous year. This was mainly due to higher volumes, especially of herbicides. Sales were also positively impacted by currency effects and significantly higher price levels.

Sales in the region **South America, Africa, Middle East** amounted to €2,712 million, €722 million above the previous year, and were driven by significantly higher prices and positive currency effects, both primarily in Brazil. Slightly higher volumes, especially for herbicides and seed treatment products, also contributed to the positive development.

Agricultural Solutions – sales

By indication and sector



At €1,220 million, **income from operations (EBIT) before special items** was €505 million above the 2021 figure. The increase was primarily due to strong sales growth. This more than compensated for increased raw materials and energy prices and higher fixed costs.

EBIT amounted to €1,221 million, €525 million higher than in the previous year.

 For the outlook for 2023, see page 154 onward

Agricultural Solutions sales by region

(Location of customer)

Division	Europe	North America	Asia Pacific	South America, Africa, Middle East	Total (million €)
Agricultural Solutions	24%	39%	11%	26%	10,280

Products and applications

Indications and sectors	Applications	Selected products
Fungicides	Protecting crops against harmful fungal diseases, improving plant health, securing yield and harvest quality with chemical and biological solutions	Boscalid, dimethomorph, F500®, Initium®, metiram, metrafenone, Revysol®, Serifel®, Xemium®
Herbicides	Reducing competition from weeds for nutrients, water and sunlight to secure yield and harvest quality	Dicamba, dimethenamid-p, glufosinate, imazamox, Kixor®, Luximo®, pendimethalin, Tirexor®, topramezone
Insecticides	Chemical and biological solutions to combat insect pests in agriculture and beyond, such as in the areas of public health, professional pest control and landscape maintenance	Alpha-cypermethrin, Brotianilide, chlufenapyr, fipronil, Inscalis®, Interceptor®, Nealta®, teflubenzuron, Termidor®
Seed Treatment	Improving seeds' potential with chemical and biological protection as well as inoculants	ILEVO®, Integral® Pro, Poncho Votivo®, Relenza®, Seperit®, Systiva®, Teraxxa™, Vault® HP
Seeds & Traits	Seeds and traits for key field crops such as canola (oilseed rape), cotton, soybean and wheat, as well as vegetable seeds	Credenz®, FiberMax®, InVigor®, LibertyLink®, Nunhems®, Stoneville®

Other

Sales in Other amounted to €4,368 million, €703 million above the prior-year figure. The increase was mainly due to sales growth in commodity trading.

EBIT before special items improved by €12 million year on year to –€749 million. This was primarily attributable to higher income from long-term incentive programs, among other factors. Income also arose from hedging transactions.

EBIT improved by €236 million to –€523 million. This included special income from the partial divestiture of the interest in the Hollandse Kust Zuid wind farm in April 2022.

Financial data – Other ^a	2022	2021	+/-
Million €			
Sales	4,368	3,666	19.2%
Income from operations before depreciation, amortization and special items ^b	–594	–607	2.2%
Income from operations before depreciation and amortization (EBITDA) ^b	–368	–602	38.9%
Depreciation and amortization ^c	155	157	–1.4%
Income from operations (EBIT) ^b	–523	–759	31.1%
Special items	226	3	.
EBIT before special items ^b	–749	–761	1.6%
of which costs for cross-divisional corporate research	–325	–355	8.5%
costs of corporate headquarters	–258	–255	–1.2%
other businesses	–43	62	.
foreign currency results, hedging and other measurement effects	33	–62	.
miscellaneous income and expenses	–156	–151	–3.3%
Assets ^{b, d}	16,803	23,007	–27.0%
Investments including acquisitions ^e	268	183	46.8%
Research and development expenses	381	378	0.7%

^a Information on the composition of Other can be found in Note 5 to the Consolidated Financial Statements from page 219 onward.

^b BASF's ethylene value chain was reorganized internally as of January 1, 2022. In this connection, the polyolefins and styrenics businesses of the joint venture BASF-YPG Company Ltd., Nanjing, China, which were previously reported under Other, were allocated to the Petrochemicals division. The prior-year figures have been adjusted. This reduced income from integral companies accounted for using the equity method, EBITDA before special items, EBITDA, EBIT and EBIT before special items in Other by €118 million in 2021 and increased these indicators in the Petrochemicals division accordingly (rounding differences are possible). The operating assets were also reallocated as part of the reorganization and increased the Chemicals segment's assets by €114 million as of December 31, 2021.

^c Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

^d Includes assets of businesses recognized under Other and reconciliation to assets of the BASF Group

^e Additions to property, plant and equipment and intangible assets

Non-Integral Oil and Gas Business

BASF holds 72.7% of the ordinary shares in Wintershall Dea AG; 27.3% are held by LetterOne. The preference shares previously held by BASF were converted into ordinary shares on May 1, 2022.

Macroeconomic environment

The price of a barrel of reference Brent crude oil averaged \$101 in 2022 (2021: \$71 per barrel). Gas prices on the European spot markets averaged €124.16 per MWh (\$38.01 per mmBtu) for the year, more than double the prior-year level and more than ten times the 2020 level. The sharp increase in gas prices was driven by the extremely tight European gas market in 2022 due to the significant reduction in gas supplied by Russia to the E.U.

Equity-accounted income of the oil and gas business

Wintershall Dea AG contributed –€4,853 million to net income from shareholdings in 2022 (2021: –€344 million). This included special items totaling –€6,307 million, primarily resulting from impairments on Wintershall Dea's Russian assets, the financing of Nord Stream 2, Wintershall Dea's participating interest in Nord Stream AG, and on assets in the German gas transportation business. In the previous year, lower oil and gas price forecasts and a divestiture of assets in Argentina led to impairments of €581 million.

BASF received dividend payments of approximately €1 billion from Wintershall Dea in 2022. In the previous year, dividend payments from Wintershall Dea amounted to €488 million.

Wintershall Dea conducts production, development¹ and exploration activities in the following countries:

- Egypt (production, development, exploration)
- Algeria (production)
- Argentina (production, development)
- Denmark (production, exploration)
- Germany (production, development, exploration)
- Libya (production)
- Mexico (production, development, exploration)
- Netherlands (production, development, exploration)
- Norway (production, development, exploration)
- Russia (activities deconsolidated in Q4 2022)
- United Arab Emirates (development)
- United Kingdom (production, development, exploration)

Wintershall Dea is also active in gas transportation. This includes interests in GASCADE Gastransport GmbH and OPAL Gastransport GmbH & Co. KG held by WIGA Transport Beteiligungs-GmbH & Co. KG, and the interest in Nord Stream AG held directly by Wintershall Dea AG.

Current developments in the Russian business

Due to increasing restrictions on its ability to influence its investments in Russia, largely as a result of government interference, Wintershall Dea deconsolidated its Russian segment in the fourth quarter of 2022 and subsequently recognized it as a financial asset measured at fair value in accordance with IFRS 9. This figure is materially impaired by interference by the Russian government, especially in the second half of 2022. This significantly burdened earnings at Wintershall Dea and the BASF Group. Together with further impairments on assets relating to the Russian business – Wintershall Dea's participating interests in Nord Stream AG and

WIGA Transport Beteiligungs-GmbH & Co. KG, as well as the loan to Nord Stream 2 AG – the special charge in income from non-integral shareholdings accounted for using the equity method amounted to €6,517 million. On January 17, 2023, Wintershall Dea announced its full exit from Russia in compliance with all legal requirements.

Wintershall Dea's activities in 2022

Wintershall Dea produced 218 million BOE (barrels of oil equivalent) in 2022 (2021: 231 million BOE), of which around 157 million BOE of gas (2021: 165 million BOE of gas). This corresponded to a daily production of 597 thousand BOE (2021: 634 thousand BOE).

Several development projects were successfully completed in 2022, including the Norwegian projects Nova, Dvalin and Njord. Production at Nova and Njord started in July and December 2022, respectively; Dvalin is scheduled to come on stream in early 2023.

Field development permits for the Dvalin North and Maria Phase 2 projects in Norway were applied for at the end of 2022. To further develop CMA-1 in Argentina, the CMA-1 consortium reached a final investment decision for the Fénix gas project in October 2022.

Wintershall Dea drilled 14 exploration wells in 2022, half of which were successful. The result of one well is still pending.

At the beginning of 2022, Wintershall Dea reached an agreement on the sale of its 50% interest in the unconventional oil blocks it operated in Argentina and decided to terminate its operations in Brazil.

¹ Development activities include projects before and after the FID (final investment decision)

In February 2022, Wintershall Dea announced that it had divested its interest in the Gulf of Suez concession to the Egyptian General Petroleum Corporation, Cairo, Egypt, with retroactive effect as of January 1, 2022.

In October 2022, Wintershall Dea signed an agreement with Hokchi Energy, the Mexican subsidiary of Pan American Energy, to acquire a 37% participating interest in the producing Hokchi Block.

In November 2022, Wintershall Dea sold its operated Brage oil field, its full interest in the Ivar Aasen oil field and a 6% interest in the Nova field development project to OKEA, Trondheim, Norway.

As part of its climate strategy, Wintershall Dea aims to achieve net zero emissions¹ from upstream activities by 2030. In addition, the company is investing in various projects that aim to contribute to global decarbonization.

Wintershall Dea and several partners have initiated the BlueHyNow project on the German North Sea coast in Wilhelmshaven, which aims to produce hydrogen from natural gas. CO₂ separated during the production of hydrogen will be shipped by sea to offshore locations in Norway and Denmark and stored under the seabed in underground reservoirs.

Together with Equinor, Stavanger, Norway, Wintershall Dea plans to pursue the development of an extensive and safe Carbon Capture and Storage (CCS) value chain connecting continental European CO₂ emitters to offshore storage sites on the Norwegian Continental Shelf (Nor-Ge project).

Wintershall Dea and its partner CapeOmega, Bergen, Norway, have been awarded a CO₂ storage licence in the Norwegian North Sea by the Ministry of Petroleum and Energy. Wintershall Dea will be the operator of this licence, which is estimated to hold a CO₂ storage injection capacity of up to 5 million tons per year.

An initial public offering (IPO) of Wintershall Dea AG would be virtually impossible in the current environment since the start of the Russian war against Ukraine. BASF stands by its strategic goal of divesting its share in Wintershall Dea AG and accordingly, continues to target an IPO of Wintershall Dea.

¹ Scope 1 and 2 emissions from upstream activities operated and non-operated by Wintershall Dea at an equity basis

Regional Results

Regions Million €	Sales by location of company						Sales by location of customer					
	2022	2021	+/-	2022	2021	+/-	2022	2021	+/-	2022	2021	+/-
Europe	35,821	31,594	13.4%	33,922	30,531	11.1%						
of which Germany	15,170	12,722	19.2%	8,977	7,300	23.0%						
North America	24,343	21,935	11.0%	23,869	20,867	14.4%						
Asia Pacific	21,309	20,632	3.3%	21,823	21,234	2.8%						
of which Greater China	11,850	12,018	-1.4%	11,624	12,036	-3.4%						
South America, Africa, Middle East	5,854	4,437	31.9%	7,712	5,965	29.3%						
BASF Group	87,327	78,598	11.1%	87,327	78,598	11.1%						

Europe

Sales at companies located in Europe rose by 13.4% compared with the previous year to €35,821 million. This was primarily the result of strong sales growth in the Materials and Chemicals segments. The Nutrition & Care and Agricultural Solutions segments and Other also recorded considerably higher sales. Sales rose slightly in the Industrial Solutions segment but declined considerably in the Surface Technologies segment.

The sales increase was mainly attributable to higher prices in all segments. Sales growth was supported by currency effects. Lower sales volumes in all segments except Agricultural Solutions had an offsetting effect. Sales performance was also impacted by negative portfolio effects, particularly in the Industrial Solutions segment following the divestiture of the global pigments business in the previous year.

North America

Sales at companies based in North America rose by 11.0% to €24,343 million compared with 2021. In local currency terms, they were 1.0% below the prior-year figure. The positive sales development was mainly attributable to considerable sales growth in the Materials and Agricultural Solutions segments. Sales were also considerably higher in the Industrial Solutions segment, in Other and in the Chemicals and Nutrition & Care segments. Only the Surface Technologies segment posted a strong decrease.

In addition to positive currency effects, substantial price increases in almost all segments contributed to sales growth. This more than compensated for significantly lower precious metal prices in the Surface Technologies segment. Sales were reduced by lower volumes, mainly driven by the decline in precious metal trading in the Surface Technologies segment. Slightly negative portfolio effects also impacted sales performance in the region. This mainly resulted from the divestiture of the global pigments business in the Industrial Solutions segment.

Asia Pacific

Sales at companies headquartered in the Asia Pacific region were 3.3% above the prior-year figure, at €21,309 million. In local currency terms, sales declined by 2.8%. This was mainly due to considerable sales growth in the Materials, Nutrition & Care, Industrial Solutions and Agricultural Solutions segments. The Surface Technologies segment achieved slightly higher sales. The Chemicals segment recorded a considerable decline in sales. In Greater China, sales decreased by 1.4% to €11,850 million.

Sales growth in the region was driven by positive currency effects and portfolio effects following the formation of BASF Shanshan Battery Materials in the Surface Technologies segment. Higher prices, mainly in the Industrial Solutions, Nutrition & Care and Materials segments, also contributed to the sales increase. Recurring production and supply chain disruptions resulting from the long-running, strict zero-COVID policy in China hampered sales development in the region and led to a considerable decline in volumes, especially in the Surface Technologies and Chemicals segments.

South America, Africa, Middle East

Sales at companies located in South America, Africa and the Middle East rose by 17.0% in local currency terms and by 31.9% in euros to €5,854 million. All segments recorded strong sales growth, especially Agricultural Solutions.

The positive sales development was primarily due to significantly higher prices and clearly positive currency effects in all segments. Sales growth was supported by slightly higher volumes overall, mainly driven by the Industrial Solutions, Nutrition & Care and Surface Technologies segments.

E.U. Taxonomy

In accordance with the E.U. Taxonomy Regulation and the supplementary delegated acts, the Nonfinancial Statement includes the proportion of the Group's taxonomy-eligible and, for the first time, taxonomy-aligned turnover, capital expenditures and operating expenditures for 2022. This applies to the environmental objectives of climate change mitigation and climate change adaptation currently addressed in the E.U. taxonomy. BASF activities that are not yet covered by the E.U. taxonomy, and as such, are not relevant under the taxonomy, are generally reported as taxonomy-non-eligible in accordance with the delegated acts. These include large parts of BASF's activities that may nevertheless be in line with the E.U.'s environmental objectives.

In order to derive the financial indicators, an analysis of our product portfolio identified the following economic activities within the meaning of the E.U. taxonomy under the environmental objective of **climate change mitigation** as relevant for BASF:

- Manufacture of batteries¹
- Manufacture of energy efficiency equipment for buildings¹
- Manufacture of hydrogen
- Manufacture of soda ash
- Manufacture of chlorine
- Manufacture of organic basic chemicals
- Manufacture of anhydrous ammonia
- Manufacture of nitric acid
- Manufacture of plastics in primary form

Compared with 2021, the activity "manufacture of carbon black" was no longer relevant in 2022 due to a plant shutdown.

To avoid double counting, assignment to an enabling activity is only made if a taxonomy-eligible product or project had not already been

included under another activity. BASF products also enable the production of technologies for renewable energy or low-carbon mobility. However, since the E.U. taxonomy focuses on the manufacture of technologies and thus excludes precursors, we have classified these activities as non-eligible under the E.U. taxonomy.

In addition to our core business, the production of chemical products, we have identified further BASF activities that can be allocated to the following activities presented in the E.U. taxonomy: afforestation; electricity generation using solar photovoltaic technology; production of heat/cool from bioenergy; production of heat/cool using waste heat; electricity generation from fossil gaseous fuels; high-efficiency co-generation of heat/cool and power from fossil gaseous fuels; production of heat/cool from fossil gaseous fuels in an efficient district heating and cooling system; close to market research, development and innovation. These activities made no material contribution² and were therefore generally classified as taxonomy-non-eligible. For the purposes of the templates set out in Annex XII to the Delegated Regulation 2021/20178, we would like to point out that we conduct activities in the areas of electricity generation, co-generation of power and heat/cool, and production of heat/cool from fossil gas. However, as presented above, these are not material. Furthermore, we would like to point out that we do not conduct any nuclear energy activities.

Buildings constructed and operated by BASF, traffic facilities and central water supply and wastewater management systems may also fall under the E.U. taxonomy's description of activities in the areas "Water supply, sewerage, waste management and remediation," "Transport," and "Construction and real estate activities." Potential contributions from such infrastructure-related activities that supported production were likewise immaterial and were generally classified as taxonomy-non-eligible.

BASF does not report any taxonomy-eligible activities under the environmental objective of **climate change adaptation**. This is firstly to avoid double counting with economic activities already

recorded under the climate change mitigation objective. Secondly, in accordance with the notice issued by the E.U. Commission, a prerequisite for taxonomy eligibility under the adaptation objective is the submission of an investment plan for implementing adaptation solutions. BASF has not prepared any such plan.

Taxonomy-eligible turnover, capital expenditures and operating expenditures

We assessed the taxonomy eligibility of our turnover based on sales as defined and reported in the Consolidated Financial Statements of the BASF Group. Taxonomy-eligible turnover accounted for 13.3% of total sales in 2022. The largest contributions were from the activities "manufacture of plastics in primary form" and "manufacture of organic basic chemicals." Taxonomy-eligible capital expenditures (including acquisitions and excluding goodwill in accordance with the E.U. taxonomy) accounted for 18.6% of the total investments reported in the Consolidated Financial Statements. Capital expenditures on the "manufacture of organic basic chemicals" and in the "manufacture of batteries" made the greatest contribution. Operating expenditures include non-capitalized costs that relate to research and development,³ maintenance and repair, and short-term lease expenses. They are not reported in the Consolidated Financial Statements in this form. All of the capital expenditures and operating expenditures of a production facility with a taxonomy-eligible activity are counted as taxonomy-eligible. Taxonomy-eligible operating expenditures accounted for 10.4% of total operating expenditures. The largest contributions were from the activities "manufacture of organic basic chemicals" and "manufacture of plastics in primary form."

Taxonomy-aligned turnover, capital expenditures and operating expenditures

The taxonomy-eligible activities identified by BASF can be classified as taxonomy-aligned if they make a substantial contribution to climate change mitigation and do no significant harm to other environmental objectives and, at the same time, ensure minimum social safeguards. The contribution to climate change mitigation and harm

¹ Enabling activity within the meaning of the E.U. taxonomy

² The production of heat/cool using waste heat was also partially covered by other activities.

³ The criteria for the activity "close to market research, development and innovation" (for example, a technology readiness level of at least six) were used to determine taxonomy-eligible research and development costs.

to other environmental objectives were reviewed in a three-step process. The **first step** involved a two-part analysis based on BASF's internal product databases:

- The manufacture of products is analyzed with respect to the use of critical substances in accordance with Annex C¹ of the E.U. Commission's Delegated Regulation 2021/2139 to ensure significant pollution prevention or control according to the E.U. taxonomy. This also includes use in the production process. An assessment of the "essential use" of the critical substances used in the sense of the opening clauses according to Annex C, letters f) and g) has not been performed. The E.U. Commission announced further regulations on this in 2023.
- Plastics in primary form are analyzed with respect to the share of renewable raw materials in the product. They are only considered further if this share is at least 5% and thus potentially make a substantial contribution to climate change mitigation through partial or complete production from renewable raw materials. Shares allocated using mass balance approaches (see page 121) are not taken into account here because their acceptance under the E.U. taxonomy has not yet been definitively clarified. For this reason, BASF products based on chemically recycled raw materials are not considered further in the assessment at present either. Mechanical recycling does not play any role for BASF here.

In the **second step**, it was assessed whether the potentially taxonomy-aligned products make a substantial contribution to climate change mitigation in accordance with the activity-specific criteria. Among other things, the greenhouse gas emissions of European and non-European plants to produce soda ash, organic basic chemicals and nitric acid were compared with the average values of the most efficient plants under the E.U. emissions trading system. For the production of hydrogen, chlorine, ammonia and plastics in primary form, the comparison was against activity-specific quantitative criteria, such as the energy or emission intensity of a product. This was based on a digital solution developed by BASF to determine product-specific carbon emissions (see page 140).

Finally, in the **third step** of the process, it was assessed whether the products identified cause significant harm to the other environmental objectives. This included an analysis of risks arising from climate change using climate risk and vulnerability assessments. At sites with material climate risk, the existence of adaptation solutions was additionally analyzed and evaluated. The avoidance of significant harm to water and marine resources,² biodiversity and ecosystems,³ and pollution prevention and control were taken as given for production plants in Europe based on comprehensive and uniform regulatory requirements and additionally ensured through data queries. The conformity of non-European plants was assessed on a case-by-case basis. This was based on joint assessments by local and central experts using the evidence of local production requirements submitted.

The criteria for the **minimum social safeguards** as a further pillar of taxonomy alignment in accordance with Article 18 of the E.U. Taxonomy Regulation were reviewed for all activities across the BASF Group, independent of the step-by-step process for the "contribution to climate change mitigation" and "harm to other environmental objectives" criteria.

The recommendations of the E.U. Platform on Sustainable Finance of October 2022 on the four core topics of human rights (including labor rights), corruption/bribery, taxation and fair competition were taken into account here. Minimum social safeguards are to be ensured by a systematic, integrated and risk-based approach to safeguarding our human rights due diligence obligations (see page 109), by global labor and social standards (see page 110), and by the Supplier Code of Conduct (see page 115), among other things.

Taxonomy-aligned turnover accounted for 0.4% of the total sales revenue defined and reported in the BASF Group's Consolidated Financial Statements in 2022. The "manufacture of organic basic chemicals" made the largest contribution (0.3%). Taxonomy-aligned capital expenditures (including acquisitions and excluding goodwill in accordance with the E.U. taxonomy) accounted for 0.5% of the

total investments reported in the Consolidated Financial Statements. The "manufacture of soda ash" contributed significantly here with 0.3%. Taxonomy-aligned operating expenditures accounted for 0.9% of total operating expenditures, with the largest contribution from the economic activity "manufacture of plastics in primary form" (0.5%). It is not possible to provide information on changes in taxonomy-aligned turnover, capital expenditures and operating expenditures as these are being reported for the first time in 2022.

The taxonomy-aligned figure is significantly lower than the taxonomy-eligible figure due to various factors. Only a small proportion of plastics in primary form contain a share of renewable raw materials above the threshold value. In many production processes, substances that fall within Annex C¹ are used to prevent or reduce pollution. As a result, these processes are no longer taxonomy-aligned, even if the substances are not released into the environment (for example, because they are exclusively used in a closed system in the production plant) and are used in accordance with existing chemicals legislation. This means, for example, that all production processes for the manufacture of battery materials must be assessed as not taxonomy-aligned. The proportion of taxonomy-aligned activities is also reduced by the fact that many plants exceed the benchmarks used by the E.U. taxonomy, such as the E.U. emissions trading scheme. In addition, plants that are not subject to emissions trading and thus cannot be assessed using the specified criteria were generally classified as not taxonomy-aligned.

¹ For more information on sales revenue, see Note 7 to the Consolidated Financial Statements from page 227 onward

For more information on investments, see Notes 14 and 15 to the Consolidated Financial Statements from page 242 onward

² Generic criteria for DNSH to pollution prevention and control regarding use and presence of chemicals

³ Protection of water and marine resources is taken as given at sites that do not use or treat water.

³ A radius of 3 km around production sites was defined for the analysis of biodiversity-sensitive areas.

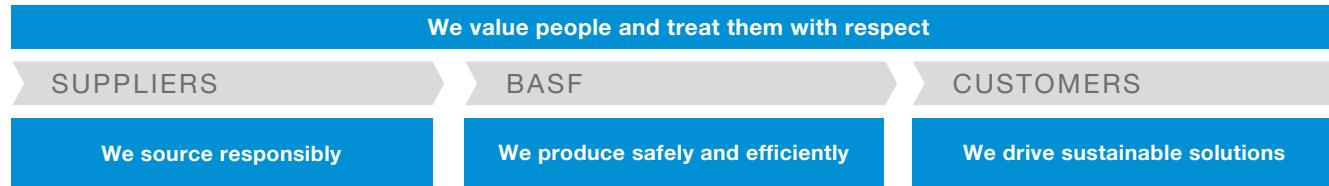
E.U. taxonomy indicators: 2022 turnover

E.U. taxonomy indicators: 2022 capital expenditures

E.U. taxonomy indicators: 2022 operating expenditures

Sustainability Along the Value Chain

We want to contribute to a better world with enhanced quality of life for everyone. That is why we have firmly anchored the three pillars of sustainability – the economy, environment and society – into our corporate purpose, our strategy, our targets and our operations along the value chain. They are at the core of what we do, a driver for growth and an element of our risk management.



We contribute to sustainability and to the **United Nations' Sustainable Development Goals** (SDGs) in many ways (see page 46). For instance, our innovations, products and technologies help to use natural resources more efficiently, meet the demand for food, enable climate-smart mobility, reduce emissions and waste, and increase the capabilities of renewable energy. Alongside these positive contributions, our business activities also have negative impacts. For example, we create CO₂ emissions, use water and procure raw materials from suppliers, which may involve a potential risk of violating labor, environmental or social standards. This is why we are constantly working to broaden our positive contributions to key sustainability topics (see page 46) along our value chain and reduce the negative impacts.

We are committed to doing business in a **responsible, safe, resource-efficient and respectful** way. We are guided here by our corporate values and our global Code of Conduct. Our actions are based on the applicable laws and regulations. Some of our voluntary commitments go above and beyond these. We stipulate globally binding rules for our employees with standards and guidelines that

apply throughout the Group. In doing so, we consider, respect and promote internationally recognized principles such as the 10 principles of the U.N. Global Compact and the Core Labor Standards of the International Labor Organization (ILO).

We want to ensure that we act in line with the applicable laws and uphold our responsibility to the environment and society with our comprehensive **management and monitoring systems**. Our Responsible Care Management System does this for environmental protection, health and safety (see page 123). We meet our responsibilities with respect to international labor and social standards chiefly through three elements: the Compliance Program (see page 179), close dialog with our stakeholders and the guideline on compliance with international labor norms, which applies Group-wide.

Our **business partners** are also expected to comply with prevailing laws, regulations and internationally recognized principles. We have established appropriate management and control systems, for example, for working with our suppliers (see page 114).

We seek dialog with our **stakeholders** to discuss critical issues and, if necessary, develop solutions together. Through our societal engagement, we want to create a positive impact, particularly in the communities surrounding our sites, and help solve global challenges.

We are involved in numerous **sustainability initiatives** to drive forward sustainability in general and, specifically, as this relates to our value chains. These include the World Business Council for Sustainable Development (WBCSD) as well as networks with thematic focus like the Alliance to End Plastic Waste (AEPW) or the Global Battery Alliance (GBA). In addition, we realize a wide range of projects – often together with partners – for example, to improve sustainability in the supply chain or to promote a circular economy. [\[1\]](#)

For more information on how we value people and treat them with respect, see page 101 onward

For more information on responsible procurement, see page 114 onward

For more information on safe and efficient production, see page 123 onward

We Value People and Treat Them with Respect

Employee engagement and empowerment are key to our success. We build networks across our business and industry to establish good relationships with our partners and stakeholders. With our solutions, our responsible business conduct and our societal engagement, we want to contribute to a better quality of life for everyone.

In this section:

Employees

Inclusion of Diversity

Responsibility for Human Rights, Labor and

Social Standards

Societal Engagement

Stakeholder Engagement

Employees

GRI 2, 3, 201, 401, 402, 404, 405



Our employees make a significant contribution to BASF's success. We want to attract and retain talented people for our company and support them in their development. To do so, we strive to cultivate a working environment that inspires and connects people. It is founded on inclusive leadership based on mutual trust, respect and dedication to top performance.

At a glance

111,481

Employees around the world

- Global targets on employee engagement and promotion of women in leadership positions
- Focus topics: promoting diversity, inclusive leadership, continuous learning

Strategy

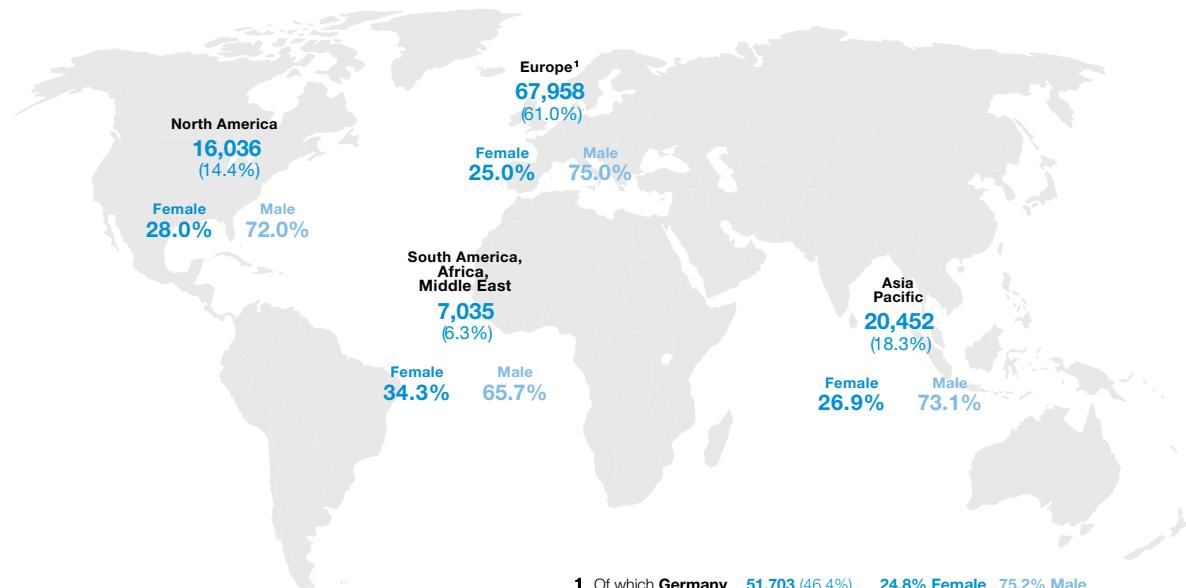
Our employees are key to the successful implementation of BASF's strategy. That is why we rely on our employees and leaders. We give them the tools and skills necessary to be able to offer our customers

products and services tailored to their needs. We promote a working atmosphere based on mutual trust with attractive working conditions, in which employees can develop their individual skills and potential. We want to further strengthen our innovative power through the inclusion of diversity. This also positions us to meet the challenges of an increasingly rapidly changing environment,

demographic change and the digital workplace. Continuous learning and individual employee development lay the foundation for this. Compensation and benefits as well as our commitment to supporting a balance between personal and professional life complete our comprehensive package. In order to continue to attract and retain talented people for our company in the future, we work continuously

BASF Group employees by region

(Total: 111,481, of which 26.4% women, as of December 31, 2022)



¹ Of which Germany 51,703 (46.4%) 24.8% Female 75.2% Male
Of which BASF SE 34,705 (31.1%) 22.1% Female 77.9% Male

on BASF's attractiveness as an employer. Our employees play an important role here as ambassadors for BASF.]

Number of employees

As of December 31, 2022, the number of employees increased to 111,481 employees compared with 111,047 employees as of December 31, 2021. The rise was primarily due to staff increases in Asia Pacific, especially for the new Verbund site in Zhanjiang, China. Furthermore, the Global Business Services unit contributed to a rise in Germany, Asia Pacific and South America. In addition, the investment project to expand infrastructure and production plants for battery materials at the Schwarzeide site in Germany led to a rise in the number of employees. The divestiture of the kaolin minerals business and the suspension of business activities in Russia had an offsetting impact. We employed 3,049 apprentices¹ (2021: 3,028). 2,468 employees were on temporary contracts (of which 47.4% were women).

Employee engagement

[BASF can rely on the engagement of its employees. This is shown by a passion for the job, a dedication to top performance and a strong commitment to BASF. Employee surveys and pulse checks are used as **feedback tools** to actively involve employees in shaping their working environment. The results are communicated to employees, the Board of Executive Directors and the Supervisory Board, among others. We have performed regular global employee surveys since 2008. We aim to keep the high level of employee engagement determined by these surveys. As part of the BASF strategy, we therefore set ourselves the following goal in 2018: More than 80% of our employees feel that at BASF, they can thrive and perform at their best. We regularly calculate the employee engagement level as an index score based on five questions on set topics in our employee surveys.

Overall, more than 75,900 employees worldwide participated in the 2022 survey (participation rate: 68%).² The survey revealed an engagement index of 81%, which can be seen as stabilization at a high level (2020: 82%). Our aim is to keep this score above 80%. We support our leaders with a range of measures to decentrally address individual action areas and in this way, help to further strengthen employee engagement together with their employees.]

What we expect from our leaders

[Our leaders and their teams should contribute to BASF's success. This is why we promote high-quality leadership and regularly measure its impact. We understand impactful leadership as leaders that serve as role models by having a positive influence on the engagement and development of their employees, and by developing and implementing business strategies in line with our corporate values. These aspects are part of the standard global nomination criteria for leadership positions.

Our leadership culture is based on BASF's corporate values: creative, open, responsible and entrepreneurial – CORE. Our specific expectations of leaders' conduct are derived from these: The **CORE Leadership Values** serve as the guiding principles for all leaders and set out our expectations of leadership conduct. They are aligned with BASF's strategic goals and reflect our company's leadership vision.

We offer our leaders a wide variety of learning and development opportunities for each phase of their career as well as various formats that enable them to learn from one another and external experts. Global and local offerings are optimally coordinated. We aim to develop leaders who lead their teams with professional competence, optimism, empathy and trust, and in this way, create a competitive advantage for BASF.

In order to further anchor the CORE Leadership Values in day-to-day life, two focus topics were defined for our leadership training in 2022: **Continuous Meaningful Conversations** (see page 106) and **Inclusive Leadership** (see page 107). These virtual training courses comprised a series of modules that provided senior executives with opportunities for self-reflection, global exchange, and practicing and consolidating competencies and skills. Since summer 2022, we have also offered other management levels training and information on Continuous Meaningful Conversations and a deep dive into the CORE Leadership Values.

Regular feedback also plays an important role in leadership development. In order to better reflect the anchoring of leadership values in daily leadership conduct, we have enhanced and refined our global feedback tool, FEEDback&forward. In 2022, more than 69,700 employees took advantage of the opportunity to provide feedback to their leader on topics such as trust, empathy, empowerment, innovation and priority setting. Employees were also able to give feedback to their supervisors on the type of leadership behavior they would like to see in the future. In 2022, the majority of our leaders again received positive feedback, which shows that they also meet the high standards BASF requires from them in their day-to-day leadership behavior. The fact that 70% of our leaders have, in the eyes of their employees, further improved their leadership over the past year also points to a clear positive trend. In this way, FEEDback&forward promotes regular and open dialog between employees and leaders and encourages them to reflect on themselves and their own performance. This enables teams to drive forward change together.]

¹ At BASF, the apprenticeship program trains students for technical, scientific and business vocations as well as for trade and craft professions.

² Scope of employees surveyed goes beyond the scope of consolidation. However, there are exceptions for companies that represent joint ventures and joint operations, as well as companies held for sale.

Competition for talent

Attracting and retaining the best employees is crucial to our success. Having an attractive and compelling total offer package for employees is becoming increasingly important given the strong global competition for the best qualified employees and leaders. This is why we are constantly working on measures to increase BASF's attractiveness in the global labor markets and are increasingly using digital platforms such as our country-specific career websites as well as global and regional social networks. This enables us to appropriately address different target groups.

Our **talent search activities** in 2022 were based on a mix of face-to-face events as well as digital offerings. We are continually enhancing and refining these offerings to be able to respond to current developments and the changing needs of applicants, and additionally, to be able to provide the best possible information about BASF as an employer virtually. For example, we are represented at digital trade fairs and conferences. This virtual contact enables a demand-oriented, flexible and location-independent approach. As a result, we were able to continue to attract and recruit talented employees.

We are also involved in long-term projects to promote talent, such as a pilot project run by the Royal Society of Chemistry to help ethnic minorities in the U.K. and Ireland pursue careers in the chemical industry. The launch event for the three-year program was held in London in September 2022.

In addition, we consistently take part in specific career events to directly reach and attract talent from various disciplines, especially female candidates. We focus in particular on our female employees as role models with various initiatives such as career fairs and networking events aimed specifically at women, or on our social media channels. In 2022, we also added a new page to the global career website that highlights our strategic targets on gender parity and on women in leadership positions.

To combat the shortage of skilled workers in production and technical areas in Ludwigshafen, Germany, we used channels like social media to alert qualified specialists to career prospects at BASF in 2022. We also cooperated with the German employment agency, for example, to target skilled workers at informational events and to recruit suitable candidates for BASF who are currently available on the labor market or will be in the near future.

In addition, we are working on implementing a digital onboarding process for new employees and their leaders in the period up to the first day of work and beyond. The plan is to roll out the Enboarder digital tool globally in 2023.

We offer a dual vocational training model at numerous sites. At production sites in the United States, for example, we provide up to three years of dual-track vocational training under the North American Apprenticeship Program (NAADP). We work with local colleges to ensure that apprentices receive comprehensive and integrated tuition, in addition to the practical experience they gain at BASF's sites. The program was expanded to additional U.S. sites in 2022.

We once again achieved high scores in a number of employer rankings in 2022. For example, in a study conducted by Universum, young scientists ranked BASF as the seventh most attractive employer in Germany (2021: second). In North America, DiversityInc named BASF as one of the top 50 companies for diversity in recruiting for the tenth consecutive year. In Asia, Top Employer recognized BASF China as one of the best employers for the thirteenth time in succession.

The BASF Group hired 10,893 new employees in 2022. The percentage of employees who resigned during their first three years of employment – the early turnover rate – was 1.9% worldwide in 2022. This turnover rate was 0.8% in Europe, 4.0% in North America, 3.8% in Asia Pacific and 2.8% in South America, Africa, Middle East.

BASF Group new hires in 2022

	2022	Of which women (%)
Europe	4,809	30.2
North America	2,422	28.6
Asia Pacific	2,606	30.6
South America, Africa, Middle East	1,056	43.8
Total	10,893	31.2

As of December 31, 2022, the BASF Group was training 3,049 people in 11 countries and around 50 occupations. We spent a total of around €131 million on vocational training in 2022. 

 For more information on careers at BASF, see bASF.com/career

Learning and development

Learning and development are essential success factors for a strong and future-oriented company culture. The **skills and competencies** of our employees are critical for profitable growth and lasting success. For this reason, we want to further modernize our learning culture and step up our efforts to promote continuous, self-directed learning and learning from others. Employee development at BASF is underpinned by the principle that development opportunities and support are open to all employees.

We understand development as continuous learning by building individual experience and skills, further training or changing jobs. A trust-based relationship between employees and leaders as well as regular feedback are crucial to employee development. Continuous Meaningful Conversations are regular conversations between leaders and employees and cover topics such as feedback, reflection, development, performance, collaboration and well-being. These conversations can be initiated by both leaders or employees and take different forms depending on individual needs – leaders and employees can agree on this in the annual employee dialog.

Employees also define their individual learning objectives together with their leader in these discussions. These are to be adapted to the specific requirements of the position concerned and future needs. Learning can take place in various formats and at different locations – at work, as social or formal learning – depending on current individual and workplace demands.

Our learning offerings are available for a variety of employee development needs: starting a career, expanding knowledge, personal growth and leadership development. In addition, the many academies in the divisions and service units offer training on specific professional content.

To achieve our ambitious digitalization goals, we are focusing on digital skills development in the leadership team and among our employees, as well as on agile transformation. Learning offerings cover not only typical, IT-related fields of competence, but also production and sustainability topics, for example. Agile leadership training plays just as important a role as development activities that help employees and leaders navigate a digitally-enabled working environment, analyze data for more targeted decision-making or improve automation processes. BASF uses the concept of digital competence profiles. These describe digital skills, tasks and behaviors and help harmonize digital skills requirements across BASF.

Additionally, we offer our employees a variety of self-learning opportunities to enhance their digital skills. The global Ways of Working portal was launched in 2021. Over one-third of our employees have already taken advantage of this offer. In 2022, around 28,600 employees participated in events such as the global collaboration weeks, “open house” question and answer sessions on new ways of working, and workshop series on virtual collaboration. In addition, 600 colleagues volunteered as change agents and served as contacts on virtual collaboration topics. This enables social learning directly in the workplace. In addition, over

5,200 employees are active in the Ways of Working community on our social network.

Alongside formal learning opportunities, the “project marketplace” social platform offers further agile development opportunities. Employees are able to grow professionally by taking on new tasks without having to change jobs internally and benefit from the experience they gain from working on digital projects. Over 600 employees took up this offer in 2022.]

Good to know



「Agile learning formats」

Agile learning formats are characterized by a high degree of self-organization on the one hand and cooperation on the other. At BASF, they are primarily applied directly in a working context, for example in the form of design thinking, learning circles or hackathons. With the regular Climathon initiative, for example, BASF aims to find and nurture solutions that advance digitalization and sustainability together. In 2022, BASF also participated in the HerHackathon 2022, where 250 female digital talents from across Europe worked on seven challenges from multiple companies. Participating in events of this kind helps us to be perceived as an attractive digital employer and to attract new talent.

Citizen development is an important pillar of BASF's digitalization strategy. In IT jargon, citizen developers are the opposite of professional software developers – interested users who, after a short learning phase, independently create digital applications. There are now more than 10,000 citizen developers at BASF, who have access to various platforms to develop simple digital solutions themselves and strengthen BASF's digital transformation.

Compensation and benefits

We want to attract and retain engaged and qualified employees, and motivate them to achieve top performance with a total offer package that includes market-oriented compensation, individual development opportunities and a good working environment. Our employees' compensation is based on **global compensation principles** according to position, market and performance. As a rule, compensation comprises fixed and variable components as well as benefits that often exceed legal requirements. In many countries, these benefits include company pension benefits, supplementary health insurance and share programs. We regularly review our compensation systems at the global and local levels.

We want our employees to contribute to the company's success. This is why the compensation granted to the vast majority of our employees includes variable compensation components, with which they participate in the success of the BASF Group as a whole and are recognized for their individual performance. The same principles essentially apply for all employees worldwide. The amount of the variable component is determined by economic success as well as the employee's individual performance. We use the BASF Group's return on capital employed (ROCE) to measure economic success for the purposes of variable compensation. This links **variable compensation** to our ROCE target.¹ Individual performance is assessed as part of a globally consistent performance management process. In numerous Group companies, our "plus" share program ensures employees' long-term participation in the company's success through incentive shares. In 2022, for example, around 27,100 employees worldwide (2021: around 23,600) participated in the "plus" share program.

BASF offers senior executives the opportunity to participate in a **long-term incentive (LTI) program**² in the form of a performance share plan. The LTI program has a term of four years and takes into account the development of the total shareholder return. It

incentivizes the achievement of strategic growth, profitability and sustainability targets. To take part in this program, participants must hold BASF shares, the amount of which is based on their individual fixed compensation. In 2022, around 94% of the people eligible to participate in the LTI around the world did so, holding between 30% and 70% of their fixed annual compensation in BASF shares. The share price-based compensation program (BASF Option Program, BOP), which had existed since 1999, was offered for the last time in 2020.³

 For more information on share price-based compensation programs and BASF's share programs, see the Notes to the Consolidated Financial Statements from page 285 onward

 For more information on the compensation of the Board of Executive Directors and the Supervisory Board, see the Compensation Report at bASF.com/compensationreport

Personnel expenses

Expenses for wages and salaries, social security contributions and assistance, as well as for pensions totaled €11,400 million in 2022. In the previous year, these amounted to €11,097 million. The rise was mainly attributable to a higher wage and salary level, currency effects, particularly from the U.S. dollar, as well as a higher average number of employees. Declining bonus provisions and lower pension expenses had an offsetting effect.

BASF Group personnel expenses

Million €

	2022	2021	+/-
Wages and salaries	9,102	8,847	+2.9%
Social security contributions and assistance expenses	1,598	1,519	+5.2%
Pension expenses	701	732	-4.2%
Total personnel expenses	11,400	11,097	+2.7%

Balancing personal and professional life

Our identity as an employer includes our belief in supporting our employees in balancing their personal and professional lives. We want to strengthen their identification with the company and our position in the global competition for qualified personnel. To achieve this, we have a **wide range of offerings** aimed at employees in different phases of life that accommodate – as far as the job allows – the growing demand for flexibility in when and where they work. These include flexible working hours, part-time employment, remote working, and time off options that provide the necessary flexibility to care for children or family members, for example. We are continually working to expand these options and increasingly support the effective use of digital solutions here.

We have formulated guidelines for more flexibility in where, when and how employees work. These opportunities have become an integral part of our employees' day-to-day work, job permitting.

At the Ludwigshafen site in Germany, for example, teams can draw on many tools to live more flexibility and at the same time, strengthen teamwork. Many BASF units have hybrid work models, working partly on-site and partly remotely. Desk-sharing concepts support the new form of collaboration and create areas to withdraw as well as new interaction spaces for sharing ideas and being creative together. There are also external and internal co-working opportunities that employees can take advantage of.

Our Work-Life Management employee center in Ludwigshafen, Germany, (LuMit) offers a number of services under one roof: childcare, fitness and health, and the Employee Assistance Program with social counseling services offered by BASF Stiftung.

Other BASF sites also have a wide range of services to foster a balance between personal and professional life and promote health and fitness. For example, the Münster and Frankfurt sites in Germany

¹ In calculating compensation-relevant ROCE, adjustments are made for negative and positive special items resulting from acquisitions and divestitures (for example, integration costs in connection with acquisitions and gains or losses from the divestiture of businesses) when these exceed a corridor of +/−1% of the average cost of capital basis. An adjustment of the compensation-relevant ROCE (in the first 12 months after closing) therefore only occurs in cases of exceptionally high special items resulting from acquisitions and divestitures.

² The LTI program referred to here is aimed at management levels 2 to 4 as well as individual employees who have attained senior executive status by virtue of special expertise.

offer mobile and hybrid working, childcare options including emergency care, and psychosocial support and counseling services.

In Germany, the Employee Assistance Program with social counseling services has been offered for 100 years under the organizational umbrella of BASF Stiftung: It provides an anchor and supports people in difficult life situations in Ludwigshafen and at three other German locations. In addition, BASF Stiftung promotes projects around the world to permanently improve the living conditions of people in need and to help people affected by emergencies and natural disasters. Examples include the year-end donation campaign "#HornOfAfrica – Children need water and food" and the major donation campaign "#ColleaguesForUkraine". The site in Lemförde, Germany, also hosted an aid campaign for Ukrainian refugees, organizing a leisure program for a total of around 45 refugee children and their mothers as part of summer holiday care.

We have also offered our South American employees numerous support services for many years now. For example, there is a team that coordinates activities to promote employees' emotional, physical and social well-being. The portfolio is continuously enhanced and refined to optimally meet current local needs. One focus topic in 2022 was burnout and illness prevention.

In Asia, too, many countries have specific support programs designed to help employees with personal and professional problems. These include a wide range of offers, for example on mental health and on preventing and dealing with stress. Thanks to employees' voluntary efforts, employees in need were provided with special assistance such as food packages during the lockdown triggered by the coronavirus pandemic in 2022.]

 For more information on BASF Stiftung, see baf-stiftung.org

Mutual respect and open dialog

Openness is one of BASF's corporate values. That is why our stakeholder dialog is based on **honesty, respect and mutual trust**. This also applies to dialog with our employees.

All employees have the opportunity to form, join and support legally recognized trade unions or employee representatives. These are entitled to represent employees and their interests in collective bargaining. BASF upholds these rights and has anchored this in the Group-wide guideline on compliance with international labor norms.

Trust-based cooperation with employee representatives is an important component of our corporate culture. Our open and continual dialog lays the foundation for balancing the interests of the company and its employees, even in challenging situations. In 2022, this underpinned our efforts to manage the effects of the war in Ukraine and the coronavirus pandemic, for example. In the case of organizational changes or if restructuring leads to staff downsizing, for example, or in the case of other codetermination-relevant topics, we involve employee representatives at an early stage to develop socially responsible implementation measures. Our actions are aligned with the respective legal regulations and the agreements reached, as well as operational conditions.

By focusing our discussions on the local and regional situations, we aim to find tailored solutions to the different challenges and legal conditions for each site. The BASF Europa Betriebsrat (European Works Council) addresses cross-border matters in Europe. In South America, we foster continual dialog with employee representatives in the Diálogo Social.

We are also committed to social dialog with employee representatives where freedom of association is not guaranteed under national law to the same extent as in European legal systems.]

 For more information, see baf.com/employeerepresentation



Our Diversity and Inclusion programs promote a workplace that welcomes everyone and strengthens the sense of belonging at BASF. This allows us to perform at our best together and work to be the world's leading chemical company for our customers.

Material topics in focus:

Inclusion of Diversity

GRI 3, 404, 405

SUPPLIERS → BASF → CUSTOMERS

BASF strives to foster a working environment based on mutual respect, trust and appreciation. Promoting and valuing diversity across all hierarchical levels is an integral part of our strategy and is also embedded in our corporate values.

For us, diversity means, among other things, having people from different backgrounds working at our company who can draw on their individual perspectives and skills to grow our business. As a global company, we serve many different customer needs. We also want to reflect this diversity in our workforce. By valuing and promoting employee diversity, we boost our teams' performance and power of innovation, and increase creativity, motivation and employees' identification with the company.

We expect **inclusive conduct** from all employees. By this, we mean creating an environment in which different aspects of diversity and individual strengths are valued. That is why in 2022, we focused on the topics of inclusion and our employees' sense of belonging at BASF.

Our leaders play an important role in promoting diversity and creating an inclusive work environment. We support them with various offerings, for example as part of leadership development. In 2022, our leaders had the opportunity to deep dive into inclusive leadership in a training series on the CORE Leadership Values (see page 102). The training supported our leaders in what they can specifically do to make the work environment more inclusive for all employees and how they can live up to their role model function and develop further.

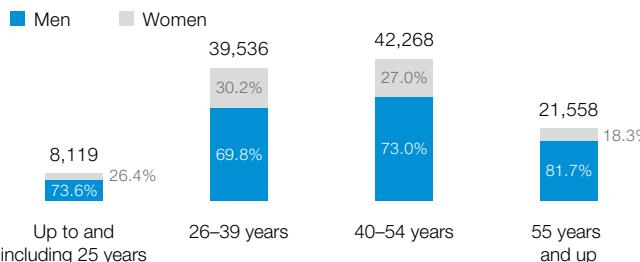
To fulfill their responsibility for creating an inclusive workplace, all leaders in North America have been required since 2022 to set goals for the inclusive leadership of their teams. These are incorporated

into their respective target agreements and implementation is reviewed. Market regions and countries in Europe developed individual diversity and inclusion roadmaps in 2022. The focus was on identifying the relevant topics in each country. In addition, since 2022 we have also been using the inclusion index to measure our employees' sense of belonging as part of the regular employee survey (see page 102).

Integrating different perspectives is very important to BASF and we want to create a greater awareness of diversity in our organization. For instance, we have created a digital learning format on unconscious bias for all employees. There are also a number of Employee Resource Groups around the world dedicated to different aspects of diversity. For example, the LGBTQ+ network in Ludwigshafen, Germany, celebrated its tenth anniversary in 2022.

BASF Group employee age structure

(Total: 111,481, of which 26.4% women, as of December 31, 2022)



To enable our management to monitor progress toward this target, we have developed a global dashboard that is used to regularly review the status of implementation. The systematic advancement of women is an integral part of our process for selecting senior executives and is regularly addressed in strategic dialogs with the divisions at the level of the Board of Executive Directors and in the Board's strategic talent discussions. We also offer various programs to help female executives strengthen their network and increase their visibility at senior executive level.

Leaders and specialists in the BASF Group

	December 31, 2022	Of which women (%)
(Senior) executives ^a	9,329	27.2
Specialists ^b	41,333	32.5

^a With disciplinary leadership responsibilities^b Without disciplinary leadership responsibilities (previously "professionals")

Diversity also relates to the company's demographic profile, which varies by region within the BASF Group. Our aim is to create a suitable framework to help maintain the employability of our personnel at all stages of life and ensure the availability of qualified employees over the long term.

We also promote diversity in the selection and development of our leaders. We have set a global target to promote female leadership and aim to increase the proportion of women in leadership positions to 30% by 2030.

2030 target

Proportion of women in leadership positions with disciplinary responsibility

30%

We have made important progress toward this and continually review our target. In the BASF Group, the global proportion of female leaders with disciplinary responsibility was 27.2% at the end of 2022 (2021: 25.6%).

As a signatory to the United Nations' Women's Empowerment Principles (WEPS), we are committed to promoting gender equality. We are also involved in other external initiatives to promote inclusion of diversity and equal opportunities in the workplace, such as the Business for Inclusive Growth (B4IG) initiative.]

For more information on diversity in the Board of Executive Directors and the Supervisory Board, see page 169 onward

For more information on diversity and inclusion, see basf.com/diversity



Projects such as the Pragati project on sustainable castor bean farming, founded by BASF together with Arkema, Jayant Agro-Organics and implementation partner Solidaridad, start on the ground to build specific expertise for sustainable and responsible supply chains.

Material topics in focus:

Responsibility for Human Rights, Labor and Social Standards

GRI 2, 3, 406, 407, 408, 409, 411, 413



BASF acknowledges its responsibility to respect internationally recognized human rights. For many years now, we have engaged in constructive dialog on human rights with other companies, nongovernmental organizations, international organizations and multi-stakeholder initiatives to better understand different perspectives and address conflicting goals. BASF is a founding member of the U.N. Global Compact and a member of the Global Business Initiative on Human Rights (GBI).

At a glance

- Human rights due diligence as a Group-wide task
- Systematic and extensive anchoring of human rights topics in company processes and culture
- Commitment to respecting international labor and social standards enshrined in our global Code of Conduct
- Chief Human Rights Officer appointed to oversee human rights risk management

Strategy and organization

We see human rights due diligence as an important, all-encompassing task that we can only perform by working together as a team throughout the entire organization. That is why we have embedded our responsibility for human rights into our Code of Conduct and set this out in our Policy Statement on Human Rights. We uphold our standards worldwide, including where they exceed local legal requirements. All employees and leaders are responsible for ensuring that we act in accordance with our Code of Conduct and our Policy Statement on Human Rights. In everything we do, we

are committed to complying with international labor and social standards.

We rely on a systematic, integrated, risk-based approach and **established monitoring and management systems**. BASF is also active in initiatives such as Together for Sustainability (TfS) and Responsible Care®, which promote sustainability in the supply chain. Our measures and criteria for monitoring and respecting human rights are integrated into supplier assessment processes and our global monitoring systems for environmental protection, safety and security, health protection and product stewardship (see page 114). They are also part of the evaluation of investment, acquisition and divestiture projects, assessments along the entire product life cycle, and systems to monitor labor and social standards. In addition, aspects of human rights topics are part of the global qualification requirements for security personnel and are incorporated into standard agreements with contractors.

Our compliance unit is responsible for steering human rights topics and coordinates cross-unit collaboration. As **Chief Human Rights Officer**, the head of our legal and compliance organization is responsible for overseeing human rights risk management. In our Human Rights Expert Working Group, representatives from various areas of our company work closely together to holistically assess

and refine our approach to human rights governance. It includes employees from specialist departments – Corporate Compliance (coordination), Global Procurement, Corporate Legal, Corporate Human Resources, Environmental Protection, Health, Safety and Quality, Corporate Strategy & Sustainability, Corporate Security, Digital and Procurement Governance, Corporate Communications and Governmental Relations – and our operating divisions. The expert working group provides support and advice in challenging and critical situations, on the development of internal processes, and on the creation of information and training offerings, among other things. In this way, we want to ensure that we approach our human rights responsibility holistically and that we can continually improve our performance.

International labor and social standards

Our aim of acting responsibly toward our employees is embedded in our **global Code of Conduct** through our voluntary commitment to respecting international labor and social standards. This encompasses internationally recognized labor norms as stipulated in the United Nations' Universal Declaration of Human Rights, the OECD Guidelines for Multinational Enterprises, and the Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy of the International Labour Organization (ILO). In order to meet the requirement to comply with these standards worldwide, we mainly approach our adherence to international labor and social standards using three elements: the Compliance Program (including compliance hotlines), close dialog with our stakeholders (such as with employee representatives or international organizations) and the BASF guideline on compliance with international labor norms, which applies Group-wide. This guideline concretizes the topics in our global Code of Conduct under "Human rights, labor and social standards" as these relate to our employees. In 2022, an additional guideline specified that these topics must also be considered and applied when working with temporary employees and freelancers.

It forms the basis for our global, risk-based management process: We regularly monitor changes to the national law of all the countries

in which BASF operates and evaluate our adherence to international labor and social standards. If the national law contains no or lower requirements, action plans are drawn up to successively close these gaps in a reasonable time frame. If conflicts with national law or practices arise, we strive to act in accordance with our values and internationally recognized principles without violating the law of the country concerned. As part of the management process, we regularly follow up on and document the results of the comparison between national law and our guideline, as well as measures to implement the guideline. This is part of our central due diligence system.

We monitor our voluntary commitment to international labor and social standards as part of our management process. As before, individual elements of the guideline are also reviewed as part of internal control processes such as Responsible Care audits at BASF Group companies. In addition to these quality assurance

Good to know

Human Rights Advisory Council

We established a Human Rights Advisory Council in 2020 to integrate external expertise. Its members include independent international human rights experts. The trust-based dialog on human rights topics helps us to better understand different perspectives and to deal more openly with critical situations. The meetings held in 2022, which were chaired by our Chief Compliance Officer, were attended by representatives from the Corporate Compliance and Corporate Strategy & Sustainability departments as well as other experts from the operating divisions or procurement as required. We maintained our dialog with the Human Rights Advisory Council in 2022, both with the body as a whole and in small groups. The Council provided an external perspective, for example, on the further development of our human rights position, on due diligence in challenging circumstances, and on the limits of corporate governance.

measures, compliance with international labor and social standards is an integral part of the standard questionnaire in the compliance management audits conducted by the Corporate Audit department.

 For more information on corporate governance and compliance, see page [168](#) onward

 For more information on labor and social standards, see bASF.com/labor_social_standards

Cooperation along our value chains

As an international company, we are a part of society in the countries in which we operate and have business relationships with partners around the world. We are confronted by the fact that there are states that do not honor their obligation to protect human rights. People are particularly at risk in such countries, and companies' ability to act is often very limited. Here, too, we are committed to our values and contribute to the respect of human rights.

We have trustful working relationships with our partners (customers, suppliers, joint venture partners, contractors), expect them to comply with internationally recognized human rights standards and to expect the same of their partners further along the value chain. We work to ensure that our partners meet their respective responsibilities.

We can only achieve our goal of strengthening respect for human rights along our value chains if we work together. We have clearly defined our expectations in our Supplier Code of Conduct. We are in close contact with our business partners, especially in higher-risk areas and regions, and monitor the implementation of relevant standards and necessary measures for improvement. We use recognized assessments and audits to verify this. In 2022, we continued our work with our upstream supply chain, where we usually have no direct contractual relationships, less transparency and less influence. Here, we seek to increase our influence through collaboration with partners and stakeholders, and place importance on certifications such as the LBMA certificate for gold, the LPPM certificate for platinum group metals, and the Responsible Minerals Initiative's Responsible Minerals Assurance Process.

We work together with partners, civil society and in cross-sector initiatives. These include the Global Battery Alliance and the Round-table on Sustainable Palm Oil. Projects often start on the ground to build specific expertise for sustainable and responsible supply chains. Examples include the Sustainable Castor Initiative – Pragati in India, the Responsible Lithium Partnership Initiative in Chile, the Responsible Mica Initiative in India and the Cobalt for Development pilot mining project in the Democratic Republic of Congo. In 2022, BASF, Syngenta and Arisa also worked together on a multi-stakeholder initiative in the vegetable seeds business in India. The initiative, WISH (Wage Improvements in Seed Hybrids), addresses the issue of child labor and compliance with minimum wage.

 For more information on standards in our supply chain, see page [114](#) onward

For more information on raw materials, see page [117](#) onward

Further development of our organization and processes

We again initiated various measures to further strengthen our organization and processes in 2022. These measures are also important against the background of new regulations, especially the German Supply Chain Due Diligence Act (SCA). These include the appointment of BASF's Chief Human Rights Officer and the further development of our Policy Statement on Human Rights, including further explanations of our approach to human rights due diligence and priority risks for our company. Both of these measures were approved by the Board of Executive Directors in November 2022.

To strengthen due diligence in the supply chain, we have also enhanced and refined a range of measures, including supplier risk analysis as well as preventive measures such as the systematic business partner due diligence for new suppliers, our Supplier Code of Conduct, and the requirements to be embedded in suppliers' contracts. We continue to expect our suppliers to enforce our standards at their suppliers and subcontractors, too. Furthermore, the rights of third-party workers in high-risk countries will be even better protected in the future through additional due diligence steps. These include risk-based controls and measures that promote transparency and awareness of human rights issues.

We have also been able to analyze and confirm BASF's compliance with the specific environmental treaties covered by the SCA (Minamata, Stockholm, Basel) in countries that have not yet ratified these conventions.

Information and awareness-raising measures, grievance mechanisms

Promoting awareness of human rights was again a focus topic in 2022. Workshop programs on this were held in our operating divisions. In addition, employees in all regions were informed about and sensitized to human rights topics through presentations and discussion formats for specific target groups.

Our grievance mechanisms, which we already improved in 2021 with the introduction of a standardized global hotline and reporting system, were also used in 2022. A total of 151 human rights-related complaints were received by phone as well as by post and e-mail (2021: 206). All complaints were reviewed and forwarded to the relevant departments for in-depth investigation. If justified, appropriate measures were taken. The 65 closed and justified cases were primarily harassment cases, followed by cases of discrimination. Our grievance channels did not identify any instances of child labor or forced labor.

We report on our global targets, monitoring systems and measures to integrate human rights topics into our business activities in publications such as this report and online. 

 For more information on our production standards, see page [125](#) onward

 See bASF.com/humanrights for more information on the Policy Statement on Human Rights and a comprehensive report on the implementation of due diligence in accordance with the requirements of the National Action Plan developed by the German government, and in accordance with the U.N. Guiding Principles on Business and Human Rights

For more information on the Human Rights Advisory Council, see bASF.com/human-rights-council

Societal Engagement

GRI

203,413

At a glance

- BASF wants to be a responsible neighbor around the world
- BASF with a long tradition of commitment to science education

Societal engagement is a cornerstone of our corporate social responsibility. Through our activities, we want to strengthen the communities surrounding our sites worldwide, help achieve the SDGs, and have a positive long-term impact on the environment and society. Based on our business model and competencies, we aim to support and protect health, skills and resources, contributing to a sustainable future for individuals and society.

One example of our **contribution to public health is our cooperation** with the non-governmental organization (NGO) Beyond Suncare, which aims to protect people with albinism from skin cancer, discrimination and attacks. The NGO has a long history of working with BASF to develop and provide sunscreen products that address the specific challenges of people with albinism in the sub-Saharan region. BASF provides its know-how and ingredients free of charge. Together, Beyond Suncare and BASF developed an innovative sunscreen product that reduces the risk of skin cancer among the vulnerable population. This is just one example of how this initiative is improving the quality of life, safety and dignity of people with albinism in Africa.

Education is key to personal success and the future viability of society. That is why BASF is committed to working with partners at numerous sites to achieve greater educational equality, especially for disadvantaged children and young people. BASF has been fostering curiosity and stimulating an interest in science for 25 years now with **BASF Kids' Labs**. The experimentation programs have since reached approximately 1.2 million children in 45 countries.

Since 2011, they have been complemented by the Virtual Lab, which has been used by around half a million children to date.

BASF aims to **contribute to more education for sustainable development** with the Young Voices for a Sustainable Future project. More than 1,000 young people across eight countries were empowered to recognize and address the consequences of climate change in their communities. With their project proposals, participants used their potential to draw attention to challenges and help to eliminate them. The young people were supported by more than 80 BASF employees.

We aim to create long-term value for BASF and society with new business models and cross-sector partnerships. Our **Starting Ventures program** helps people from low-income areas to improve their economic opportunities and their quality of life. The program also provides access to new markets and partners and contributes to achieving the SDGs. Eight new Starting Ventures projects were selected for implementation in December 2022. BASF is tackling challenges on the ground together with local partners and contributing to the SDGs with entrepreneurial ideas, technical expertise and time resources. One project under our Starting Ventures program is the Waste-2-Chemicals project in Lagos, Nigeria. In the project, plastic waste is collected by local residents, sorted and then converted into pyrolysis oil. This pyrolysis oil is available as feedstock for the production of high-quality chemical products. In cooperation with nonprofit organizations, this enables local waste collectors and their families to earn a regular income.

BASF Group expenses for societal engagement activities¹

~€30 million

In the area of **international development cooperation**, we support the independent charitable BASF Stiftung with donations for its projects in cooperation with various organizations. The 2022 year-end donation campaign in favor of BASF Stiftung supported the United Nations Children's Fund, UNICEF, to provide children and their families in the Horn of Africa with access to food and water. BASF topped up the donations made by employees of participating German Group companies to a total of around €458,000.

In 2022, BASF also made donations to support people affected by the Russian attack on Ukraine. To this end, BASF initially provided €1 million in emergency aid to the German Red Cross in February 2022. In April, BASF additionally doubled the amount donated as part of the global employee fundraising campaign "#ColleaguesFor-Ukraine" (€2,110,156 in total) to around €4.2 million. The donations benefited BASF employees from Ukraine through BASF Stiftung and Ukrainian refugees through the U.N. Refugee Agency.

In addition, BASF supported those affected by natural disasters. For example, we support the National Disaster Management Authority in Pakistan with mosquito nets and pest control products to protect the population in flooded areas.

¹ For more information on Starting Ventures, see bASF.com/en/starting-ventures

For more information on societal engagement at our sites, see ludwigshafen.bASF.de

For more information on our societal engagement around the world, see bASF.com/en/engagement

Stakeholder Engagement

GRI

2,3,413

At a glance

- Dialog with various stakeholder groups with a focus on contributing to the U.N. Sustainable Development Goals (SDGs)
- The Stakeholder Advisory Council's focus areas: climate protection, the energy transformation and social responsibility

We leverage the expertise of our stakeholders in our own advisory bodies, global networks and worldwide initiatives and actively engage in dialog, contributing our expertise.

For instance, we have been a member of the **U.N. Global Compact** since its establishment in 2000. BASF consistently supports the U.N. Global Compact's 10 principles of responsible business conduct and the Sustainable Development Goals. In addition, we are participating in the pilot phase of the U.N. Global Compact's new reporting format and are active in 13 local Global Compact networks.

In 2022, we again discussed relevant sustainability topics with our **Stakeholder Advisory Council (SAC)**. Based on this joint dialog, BASF's sustainability management is critically reviewed and systematically enhanced and refined. The tenth meeting focused on the significance and aspects of the societal dimension of sustainable development.

Topics discussed by the **Human Rights Advisory Council** included particular challenges in the battery materials value chain.

For more information on our stakeholder dialog, see bASF.com/en/stakeholder-dialog

For more information on our stakeholder activities, see bASF.com/stakeholder-engagement

We Source Responsibly

As a global business, we have a responsibility to manage our supply chains carefully. We connect with our suppliers to source raw materials responsibly. Our partnerships with suppliers are based on mutual value creation, as well as a reliable supply of raw materials, technical goods and services at competitive prices.

In this section:
Supplier Management
Raw Materials

Supplier Management

GRI 2, 3, 204, 304, 308, 403, 407, 408, 409, 414



BASF sources many raw materials, precursors, technical goods and services. Our suppliers are an important part of our value chain. Our objective is to create competitive advantages through our professional procurement structures, to establish stable and reliable supply chains, and at the same time, meet high ethical and environmental standards. Together with our suppliers, we want to improve sustainability in the supply chain and minimize risks.

At a glance

€54 billion

global procurement spend

85%

of relevant spend¹ covered by sustainability evaluations

- Sustainability-oriented supply chain management
- Global targets to increase sustainability in the supply chain
- Supplier Code of Conduct creates transparency
- Risk-based evaluation with clearly defined follow-up processes

Strategy and governance

Our procurement organization ensures a reliable supply of raw materials, energy, precursors, technical goods and services to BASF. Alongside economic and qualitative criteria, we also take environmental, social and ethical aspects into account in cooperating with our suppliers.²

Our sustainability-oriented supply chain management is an integral part of our risk management. We have defined our standards in a global guideline. We are continually refining and optimizing this guideline and our structures and processes in response to changing conditions, such as the new obligations arising from the German **Supply Chain Due Diligence Act** (SCA), which requires large companies to conduct due diligence on human rights and certain environmental standards in their supply chains from January 1, 2023. In principle, this applies both to our own business operations and to direct and indirect suppliers. Based on a gap analysis of the new statutory due diligence obligations, we have further strengthened existing structures and processes and summarized our human rights positions in a policy statement (see page 109). The head of the legal and compliance organization was appointed Chief Human Rights Officer in 2022 and is responsible in this capacity for overseeing the supply chain risk management system. Our established supply chain management tools, such as our Supplier

Code of Conduct or the systematic risk-oriented assessment and auditing of suppliers, remain important elements and have been updated accordingly.

Procurement guidelines and targets are set centrally by the responsible Corporate Center unit and are binding for all employees with procurement responsibility worldwide. We use a multi-stage control process to ensure compliance with these requirements.

Our risk-based approach aims to identify and evaluate sustainability matters in our value chains as best possible to improve sustainability performance together with our suppliers. We regularly review and document progress based on the risk level. Procurement employees receive regular training in sustainability-oriented supplier management and responsible procurement. In 2022, around 1,400 employees received such training, covering the requirements arising from the SCA.

We depend on reliable and long-term supply relationships. Our expectations of our suppliers are laid down in the global Supplier Code of Conduct. We support suppliers in improving their sustainability performance, for example, through joint projects (see page 119) or by helping them to address shortcomings. Another example is our Supplier CO₂ Management Program launched in 2021, with which we aim to increase the transparency of upstream

¹ We understand relevant spend as procurement volumes with relevant suppliers. We define relevant suppliers as Tier 1 suppliers showing an elevated sustainability risk potential as identified by our risk matrices, our purchasers' assessments or other sources.

² BASF considers all direct suppliers of the BASF Group in the business year concerned as Tier 1 suppliers. These are suppliers that provide us with raw materials, investment goods, consumables and services. Suppliers can be natural persons, companies or legal persons under public law.

greenhouse gas emissions (Scope 3) and reduce the carbon footprint of our value chain together with our suppliers (see page 141).

 For more information on suppliers, see bASF.com/suppliers

Global targets

We actively promote sustainability in the supply chain with our ambitious targets: By 2025, we aim to have conducted sustainability evaluations for 90% of the BASF Group's relevant spend. In addition, we aim to have 80% of suppliers improve their sustainability performance upon re-evaluation by 2025. In 2022, 85% of the relevant spend had been evaluated. Of the suppliers re-evaluated in 2022, 76% had improved. Both global targets are embedded in the target agreements of persons responsible for procurement.

2025 targets

90%

Share of the BASF Group's relevant spend covered by sustainability evaluations

80%

Percentage of suppliers with improved sustainability performance upon re-evaluation

Global procurement

Our more than 70,000 suppliers make an important contribution to our value creation. They supply us with raw materials, energy, precursors, investment goods and consumables, perform a range of services and are innovation partners. We acquired raw materials, goods and services for our own production worth approximately €54 billion in 2022. Of this, around 90% was procured locally.¹ There were no substantial changes to our supplier structure.

What we expect from our suppliers

Together with our suppliers, we want to improve sustainability in the supply chain. Consequently, we require our suppliers to comply with the applicable laws in full and to adhere to internationally recognized environmental, social and governance (ESG) standards. We also expect our suppliers to make an effort to enforce these standards at their suppliers. In addition, we ask our suppliers to support and comply with our Supplier Code of Conduct – or to demonstrate and ensure their commitment to the principles specified in the Code of Conduct, for example in their own code of conduct.

Our global **Supplier Code of Conduct** is founded on internationally recognized guidelines, such as the principles of the United Nations' Global Compact, the U.N. Guiding Principles on Business and Human Rights, the International Labor Organization (ILO) conventions, and the topic areas of the Responsible Care initiative. Topics covered by the Code of Conduct include compliance with human rights, the exclusion of child and forced labor, safeguarding labor and social standards, antidiscrimination and anticorruption policies, and protecting the environment. The Code of Conduct is available in the most relevant languages for our suppliers and integrated into electronic ordering systems and purchasing conditions across the Group. In 2022, we expanded our Supplier Code of Conduct to include requirements from the German Supply Chain Due Diligence Act. Around 5,400 new suppliers committed to the Code of Conduct in 2022.

BASF conducts audits and assessments to ensure that suppliers comply with the applicable laws, rules and standards. BASF reserves the right to discontinue business relationships for non-adherence to international principles. The same applies to failure to correct violations, or for displaying patterns of non-compliance with these standards. Our Code of Conduct expressly points out that potential violations of laws, rules or standards can be reported – including anonymously – to our compliance hotlines. Each case is documented and investigated, and appropriate measures are taken as necessary.

Selection and evaluation of our suppliers

New suppliers are selected and existing suppliers are evaluated not only on the basis of economic criteria, but also ESG standards. As such, selection, evaluation and auditing is an important part of our sustainable supply chain and risk management. Processes and responsibilities are defined in a global guideline. Due to the large number of suppliers, they are evaluated based on risk. We take into account both country and industry-specific risks and the materiality of the supply relationship. We also use observations from our employees in procurement and information from internal and external databases, such as Together for Sustainability (TfS) assessments (see box on page 116).

We have suppliers with a high potential **sustainability risk** evaluated by third parties, either through sustainability evaluations or on-site audits. The list of suppliers to be assessed is updated every year. Sustainability evaluations and on-site audits are mainly conducted according to the TfS framework. A total of 79 raw materials supplier sites were audited on sustainability standards on our behalf in 2022. We received sustainability evaluations for 963 suppliers. We also take into account other certification systems and external audits, such as the Roundtable on Sustainable Palm Oil, when assessing our suppliers. Depending on business requirements, we additionally conduct our own Responsible Care audits at selected suppliers (see page 123).

¹ "Local" means that a supplier is located in the same region (according to BASF's definition) as the procuring company.

Audit results

We carefully analyze the results of our assessments and document them in a central database. Over the past few years, we have identified some need for adjustment at our suppliers with respect to environmental, social and governance standards, for example in waste management, or deviations in occupational health and safety measures and standards under labor law. Follow-up audits performed in 2022 identified improvements in these areas. Again in 2022, none of our audits identified any instances of forced labor, child labor or dangerous work and overtime performed by persons under 18.

We maintained close dialog with our South African platinum supplier **Sibanye-Stillwater**¹ in 2022 on the results of the audit from 2020, the implementation of the resulting action plan, and other relevant topics. This includes working with stakeholders to take a unified approach to local community development. All the needs for adjustment identified in the 2020 audit had been addressed by the end of 2022. BASF and Sibanye-Stillwater have agreed that future audits will follow the Initiative for Responsible Mining Assurance (IRMA) mining standard. Sustainability topics are discussed on a quarterly basis. Sibanye-Stillwater is a member and supporter of the International Platinum Group Metals Association (IPA) sustainability initiative that was co-founded by BASF. Measures include conducting comprehensive sustainability audits and sharing factors for success. The regular dialog with stakeholders continued in 2022. In addition, Sibanye-Stillwater has directly involved relevant stakeholders in Germany and South Africa in its own stakeholder dialog.

In 2022, the war of aggression in Ukraine also impacted the business relationship with our Russian raw materials supplier **Nornickel**. This could not be continued to the extent planned. We nevertheless maintain regular dialog with Nornickel, are monitoring the situation and events from a sustainability perspective, and are in contact with civil society groups. Topics addressed include the findings from the mining-specific TfS audits. TfS audits were carried

out at Nornickel's site in Polar, Russia, in the fourth quarter of 2021. The results of these audits were discussed with Nornickel and follow-up measures were evaluated. Nornickel continues to seek membership in internationally recognized industry initiatives that provide third-party verification of mining and responsible procurement standards, such as IRMA or the International Council on Mining and Metals (ICMM). However, this is only possible to a limited extent in the current environment.

Supplier development

If supplier assessments identify deviations from standards, we ask suppliers to develop and implement corrective measures within a reasonable time frame in a clearly defined follow-up process. We support them in their efforts. In South America, for example, over 300 employees of suppliers participated in a webinar on compliance and human rights in the supply chain. Together with Mercedes-Benz, we also organized a workshop in the region focusing on gender equality, which was attended by 22 logistics service providers. An important part of supplier development in 2022 was also the sustainability webinars held by TfS together with EcoVadis in various languages, with a total of over 1,900 participants. In addition, the new TfS Academy online learning platform is aimed at buyers and suppliers. It covers the entire spectrum of ESG topics. There are currently over 335 courses available in 10 different languages.

We review our suppliers' progress according to a defined time frame based on the sustainability risk identified, or after five years at the latest. In the case of serious violations of the standards defined in our Supplier Code of Conduct or international principles, we reserve the right to impose commercial sanctions. These can go as far as termination of the business relationship. In 2022, this happened in one case.

Good to know

Together for Sustainability (TfS)

BASF is a founding member of Together for Sustainability. The initiative was established in 2011 to improve sustainability in the supply chain. The focus is on the standardization, simplification and mutual recognition of supplier audits and assessments. Suppliers are evaluated by independent experts either in on-site audits or online assessments. The latter are conducted by EcoVadis, a ratings agency specialized in sustainability evaluations. At the end of 2022, TfS had 40 members with a combined procurement spend of around €400 billion. A total of 378 audits and 8,386 online assessments were performed in 2022. As a TfS member, BASF itself is assessed and in 2022 was again ranked among the top 1% companies worldwide in the sustainable procurement category. BASF is involved in the further development of TfS, for example, in activities to standardize the calculation of Scope 3 greenhouse gas emissions in the supply chain (see page 139).

¹ In 2012, an extended strike at a platinum mine in Marikana, South Africa, culminated in a violent confrontation between mine workers and armed South African police. Employees of the former mine operator, Lonmin, were among the fatalities. Ownership of the Marikana mine was transferred to Sibanye-Stillwater in 2019. For more information on the supplier relationship with the Sibanye-Stillwater mine, see basf.com/en/marikana

Raw Materials

GRI 3, 203, 204, 301, 304, 308, 413, 414



In 2022, BASF purchased a total of around 35,000 different raw materials from more than 6,500 suppliers. We want to use these resources efficiently and responsibly. The BASF Verbund and our focus on the circular economy are key strategic building blocks here. We expect our suppliers to source and produce raw materials in line with environmental and social requirements. We support them as part of our supplier management, for example, or with various sustainability projects along the raw materials supply chain.

At a glance

~35,000
different raw materials purchased

1.2 million metric tons
renewable raw materials purchased

- BASF's Verbund concept enables the efficient use of resources
- Recycled and renewable raw materials are gaining in importance
- Numerous projects to improve supply chain sustainability

Strategy and governance

Our strategy covers the entire value chain – from responsible procurement and the efficient use of raw materials in our own processes and recycling by-products to developing resource-saving solutions for our customers. We want to decouple growth from resource consumption with process and product innovations and to accelerate the shift toward **closed-loop systems**.

A Corporate Center unit sets binding, Group-wide purchasing guidelines for raw materials procurement. They are supplemented

by specific internal requirements, for example, on sourcing palm-based raw materials or certain mineral raw materials. We use a multi-stage control process to ensure compliance with these requirements.

Alongside economic, environmental and social criteria, we also consider aspects such as product safety and supply security when selecting suppliers and raw materials. Our expectations of our suppliers are laid down in our Supplier Code of Conduct (see page 115). We take a closer look at suppliers in critical supply chains, for example, mineral raw materials and renewable resources, a number of pigments and highly toxic substances. Upstream stages of the value chain are assessed for serious sustainability risks and, if necessary, suitable remedial measures are identified. In addition, we develop and test approaches to make the supply of raw materials more sustainable in joint initiatives with suppliers and other partners. Examples include our cooperative ventures and investments for recycling lithium-ion batteries (see page 120) and our joint activities on certified sustainable supply chains for renewable raw materials such as palm, palm kernel and castor oil.

BASF's Verbund concept is key to making the use of raw materials in our own processes as efficient as possible: Intelligently linking and steering our plants and processes creates efficient value chains. By-products from one facility are used as feedstocks elsewhere. This saves raw materials and energy. At the same time, the Verbund offers many opportunities to use renewable and recycled raw materials. We want to better leverage this potential going forward and gradually replace fossil resources with renewable energies and alternative feedstocks, both in our energy supply (see page 137) and in our production.

Resource efficiency and stewardship are also becoming increasingly important for our customers. That is why we are constantly working to reduce the resources consumed in the manufacturing of our products, for example through more efficient processes and innovative technologies. This enables us to offer our customers solutions that make a greater contribution to sustainability, like a smaller carbon footprint or better biodegradability. Our products

also improve resource efficiency and sustainability at many points along the value chain. For example, BASF additives increase the service life and mechanical recyclability of plastics, which saves fossil resources, reduces CO₂ emissions and enables a circular economy.

For more information on our supplier management, see page 114 onward

For more information on the circular economy, see page 43

Fossil and petrochemical resources

BASF's most important raw materials (based on volume) include gas and crude oil-based petrochemical products such as naphtha and benzene. We mainly use liquid gas and natural gas as a fuel to generate energy and steam, and as a raw material to produce key basic chemicals such as ammonia or acetylene. Naphtha is mainly fed into our steam cracker, where it is split into products such as ethylene and propylene – both important feedstocks for numerous BASF value chains. We use aromatics such as benzene or toluene to manufacture engineering plastics, among other products. Thanks to a high degree of forward and backward integration, we can produce feedstocks for our value chains efficiently while conserving resources within the BASF Verbund. This increases supply security and strengthens our resilience to fluctuations in the supply chain. We source key raw materials from different suppliers to minimize supply risks.

As part of our efforts to improve sustainability, we are continuously investigating whether fossil and petrochemical resources can be replaced with non-fossil or recyclate-based alternatives. When making decisions, we take into account economic, environmental and social aspects, as well as other important criteria like supply security, and process and product safety.

Good to know



BASF's natural gas supply in Europe

Natural gas is one of BASF's most important feedstocks. We use it as a fuel for energy supply as well as a raw material for the production of basic chemicals. BASF's natural gas demand in Europe was 32 terawatt hours in 2022. The Ludwigshafen site in Germany accounted for around 24 terawatt hours, with around 50% used for central electricity and steam generation.

The supply situation for natural gas in Europe has changed significantly with the war in Ukraine and the progressive loss of Russian gas supplies. Although all of BASF's European sites could be supplied from our Western European suppliers in line with demand in 2022, this was at significantly higher and volatile prices. Compared with 2021, the additional cost of natural gas for BASF's European sites totaled €2 billion; compared with 2020, the increase was as much as €3.4 billion.

Since March 2022, we have reduced our natural gas demand in Europe through various measures. These include technical optimizations in BASF's production network and switching to other

fuels wherever possible. In addition, we reduced production volumes at some plants with a high natural gas demand and purchased raw materials such as ammonia.

We are continuously monitoring the market and political environment and will decide what adjustments we may have to make in supply and production depending on the situation. The same applies in the event of a potential gas shortage, which would result in national gas allocation in Germany. If this were to occur, we currently assume that BASF would receive sufficient natural gas to maintain operations at the Ludwigshafen site at a reduced load.

We are doing everything we can to reduce our dependence on fossil energy, especially natural gas, even faster. Our focus here is on further increasing energy efficiency, a rapid switch to renewable energies in the power supply, and new electricity-based production technologies (see page 135).

Renewable resources

In addition to fossil resources, we employ renewable raw materials, mainly based on vegetable oils, fats, grains, sugar and wood. In 2022, we purchased around 1.2 million metric tons of renewable raw materials. We use these to produce ingredients for the detergent and cleaner industry and natural active ingredients for the cosmetics industry, for example. We also use renewable feedstocks such as biomethane and bio-naphtha in our Verbund as an alternative to fossil resources. The mass balance approach allows us to allocate the amount of renewable resources used to a wide variety of end products (see box on page 121). Examples include biomass balance coating solutions for the automotive industry such as CathoGuard® 800 ReSource and iGloss® matt ReSource, various biomass balance versions of Trilon® and Sokalan® products for the detergent and cleaner industries, or biomass balance styrene as a precursor for numerous styrenics, including the insulating materials Styropor®, Neopor® and Styrodur®.

Our aim is to continuously increase the share of renewable raw materials in our value chains. As for fossil raw materials, we also consider economic criteria, aspects of supply security, and process and product safety, as well as the potential **impact on sustainability** along the value chain. Alongside positive effects like reducing greenhouse gas emissions, these can also have negative effects on areas such as biodiversity, land use or working conditions, depending on the raw material. This is why we carefully weigh up the advantages and disadvantages of using renewable resources, for example with Eco-Efficiency Analyses. At the same time, we seek dialog with our stakeholders to raise awareness of conflicting goals. We also take into consideration recognized certification standards such as the Roundtable on Sustainable Palm Oil (RSPO) in our decisions.

As part of our commitment to greater sustainability, we concentrate on value chains that are relevant quantitatively or that do not yet have certification standards. We are also working on product innovations and on enhancing our production processes to improve the profitability and competitiveness of renewable resources. For

example, we are developing innovative processes such as biocatalysis and fermentation for the production of vitamins and enzymes, and driving forward white biotechnology for the production of chemical components from renewable resources.

Palm oil, palm kernel oil and their derivatives are some of our most important renewable raw materials. We mainly use these raw materials to produce ingredients for the cosmetics, detergent, cleaner and food industries. We aim to ensure that palm-based raw materials come from certified sustainable sources. We have been a member of the RSPO since 2004 and are involved in other national and international initiatives, such as the German Forum for Sustainable Palm Oil and the High Carbon Stock Approach organization. Based on our Group-wide Supplier Code of Conduct (see page 115), we have outlined our expectations of suppliers in the palm-based value chain in an additional sourcing policy (BASF Palm Sourcing Policy). This addresses aspects such as forest and peat conservation, respect of human and labor rights, smallholder inclusion, and certification and traceability standards. As part of our supplier and risk management, we have used the internet platform palmoil.io since 2021 to monitor deforestation activities and other possible breaches of regulations at our suppliers' sites. The annual BASF Palm Progress Report reports on our measures and progress toward more sustainability and transparency in the value chain.

We purchased 191,714 metric tons of palm oil and palm kernel oil in 2022 (2021: 242,946 metric tons). We again met our own voluntary commitment to source only RSPO-certified palm oil and palm kernel oil. This avoided more than 290,000 metric tons of CO₂ emissions compared with the procurement of conventional palm oil and palm kernel oil. We were able to trace 97% of our global palm footprint to oil mill level as of the end of 2022 (2021: 96%). In addition, we maintained the RSPO supply chain certification of our sites for cosmetic ingredients. At the end of 2022, 25 production sites worldwide were certified by the RSPO (2021: 26).

As part of our voluntary commitment, we also aim to procure the main derivatives¹ based on palm oil and palm kernel oil entirely from certified sustainable sources by 2025.

We source most of our palm-based raw materials from Malaysia and Indonesia. Smallholders account for around one-third of the total volumes produced there. We have worked together with The Estée Lauder Companies, the RSPO and the non-governmental organization Solidaridad in Indonesia since 2019 to expand our supplier base for RSPO-certified palm oil products while strengthening smallholder structures and sustainable production methods at local level. The project in the province of Lampung supports around 1,000 independent smallholders in improving their livelihoods and the sustainable production of palm oil and palm kernel oil. The focus is on efficient and sustainable farming practices and health and safety standards. The goal is for at least one-third of program participants to become certified according to the RSPO Smallholder Standard in three years.

Also important for BASF, albeit at a much smaller scale, is **castor oil**. We use castor oil to manufacture products such as plastics and ingredients for paints and coatings, as well as products for the cosmetics and pharmaceutical industries. With the objective of establishing a certified sustainable supply chain for castor oil, we launched the Sustainable Castor Initiative – Pragati in 2016 together with the companies Arkema and Jayant Agro and with Solidaridad. The initiative aims to improve the economic situation of castor bean farmers in India and, at the same time, raise awareness of sustainable farming methods. Over 80% of the world's castor beans are produced in India, mainly by smallholders. As part of Pragati, smallholder farmers receive training on topics such as cultivation methods, efficient water use, health and the safe use of crop protection products based on a specially developed sustainability code, SuCESS. Since the project was initiated, more than 6,200 smallholders and over 19,000 hectares of land have been certified for sustainable castor cultivation. Yields from this land were 22% higher than average amounts for the region published by the

local government for the 2021/2022 harvest cycle. In addition to SuCESS, the Sustainable Castor Association (SCA), which was launched in 2019 by the founders of the Pragati initiative, has also developed a sustainability code for the wider supply chain. This will allow castor beans obtained from the program to be further processed into certified castor oil and derivatives and to be introduced into the downstream supply chain. In 2022, we again sourced certified sustainable castor oil from the program and became the first chemical company in the world to successfully complete the certification process at our Düsseldorf-Holthausen site in Germany. The site supplies customers with the first certified products based on certified sustainable castor oil.

We are also driving the market transformation toward certified, sustainably sourced oleochemicals for another renewable raw material: **coconut oil**. We use coconut oil to manufacture ingredients for products such as detergents, cleaning agents and cosmetics. Following the successful completion of a cooperative project between BASF, Cargill, Procter & Gamble and the German Agency for International Cooperation (GIZ) in 2019 to establish a certified supply chain for coconut oil, our production site in Cassina Rizzardi, Italy, became the first BASF site to successfully undergo certification under the Rainforest Alliance Mass Balance Coconut scheme in 2022. This makes BASF the world's first chemical company to offer certified sustainable ingredients for personal care products based on coconut oil.

Plants also form the basis of many other products in our portfolio for cosmetics. These include our biopolymers, which we have been offering under the Verdessence™ brand since 2022, and our bioactives. Through sustainable sourcing practices, we aim to preserve ecosystems and enable sustainable management for the people whose livelihoods depend on them. For example, we have already been combining economic, environmental and social aspects for several years in our holistic procurement initiatives for argan (Morocco), rambutan and galangal (both Vietnam). With the **Responsibly Active program** initiated in 2022, we are bundling our

¹ Fractions and primary oleochemical derivatives and vegetable ester oils

existing activities even more effectively with a focus on three pillars: innovating products that protect natural resources; empowering and respecting people along our value chain; and reducing our climate impact and operational footprint. For instance, the program focuses on climate-neutral production sites and product transportation or full traceability in the plant supply chain.

 For more information on biodiversity, see page 147 onward

 For more information on our voluntary commitment to palm oil products and the Palm Progress Report, see bASF.com/en/palm-dialog

Learn more about the Responsibly Active program at carecreations.bASF.com/responsibly-active

Recycled feedstocks

Recycling is playing an increasingly important role due to limited resources, growing sustainability requirements in the markets, and regulatory developments. That is why we want to increase the use of recycled feedstocks with our Circular Economy Program: From 2025 onward, we aim to process around 250,000 metric tons of recycled and waste-based raw materials every year worldwide, replacing fossil raw materials.

A focal point of our activities here is the **chemical recycling** of plastics. This technology complements mechanical recycling and can help to reduce the amount of plastic waste that is disposed of in landfills or thermally recovered. Chemical recycling breaks down plastics into their building blocks or converts them into basic chemicals. Different methods are used to achieve this.

In our ChemCycling™ project, our technology partners use the pyrolysis process to extract pyrolysis oil from mixed plastic waste or used tires, which are not mechanically recycled as of yet. We feed the pyrolysis oil into the BASF Verbund as a substitute for fossil raw materials and manufacture new products from it using the mass balance principle (see page 121). Our customers can process these mass balance products in the same way as conventional products. Our portfolio of Cycled™ products now comprises more than 200 products, which our customers use for a wide range of applications – from transport cases for temperature-sensitive drugs to high-performance plastics for the automotive industry and functional textiles. In addition to our existing partnerships and to further expand our supply base for pyrolysis oil, we concluded a framework agreement with Arcus Greencycling Technologies in 2022. The company is currently commissioning a process demonstration unit to produce pyrolysis oil from mixed plastic waste that is not recycled mechanically on a commercial scale. The long-term goal of the agreement is to support capacity growth and enable offtake of up to 100,000 metric tons of pyrolysis oil per year.

In a cooperative project with KraussMaffei, Rampf and Remondis launched in 2022, we want to develop a process to chemically

recycle polyurethane rigid foam waste from refrigerators and freezers. Polyurethane is used as an insulation material in these electrical appliances. The project focuses on the depolymerization process and the challenge of recovering high-quality recycled polyols despite high levels of impurities in the waste stream. Initial trials with reground from discarded old appliances have already produced positive results.

In addition, BASF continues to drive forward the recycling of foam from used mattresses. Using a process developed by BASF, monomers can be recovered from the flexible polyurethane and used to produce new mattresses.

We have many years of experience and a high degree of specialization in **recycling precious metals** such as platinum, palladium and rhodium. They are used in automotive catalysts as well as in process and chemical catalysts. We primarily use the precious metals recovered in this way as feedstocks to manufacture new products for the automotive, chemical, electronics and green hydrogen industries. The carbon footprint for recycled precious metals is up to 90% lower than for primary metals from a mine. In 2022, we established a joint venture with Heraeus to enable a local supply of recycled precious metals for the Chinese market. BASF HERAEUS Metal Resource Co., Ltd. is based in Pinghu, China, where a new plant for recovering precious metals from spent automotive catalysts will also be built by 2023.

With the rapidly growing market for electric vehicles, there is also an increasing need for **recycling lithium-ion batteries**. As a leading producer of battery materials with local production capacities in the three main markets – Asia, Europe and North America – BASF has in-depth expertise in battery chemistry and process technology. We are utilizing these competencies to address battery recycling as an additional growth market in cooperation with partners along the value chain (see page 30). In this way, we want to ensure that valuable metals remain in the production cycle for as long as possible. This conserves resources and significantly reduces the carbon footprint of cathode active materials compared with the industry standard. A prototype plant for battery recycling will be

constructed at the Schwarzheide site in Germany in 2023. The prototype plant will allow for the development of new operating procedures and optimization of technology to deliver superior recovery rates of lithium, nickel, cobalt and manganese. The focus is on both spent lithium-ion batteries and products from cell manufacturers and battery material producers that do not meet product specifications. In addition, a new plant for the production of black mass from batteries on a commercial scale will be built in Schwarzheide by 2024. The investments aim to establish the full battery recycling value chain at BASF.

 For more information on the circular economy, see page 43

Mineral raw materials

We procure a number of mineral raw materials, which we use to produce automotive and process catalysts or battery materials for electromobility, among other products. We are continually improving our products and processes to minimize the use of primary mineral raw materials. At the same time, we are driving forward the recycling of mineral raw materials, for example, by recovering and reusing valuable metals from catalysts and lithium-ion batteries (see "Recycled feedstocks").

Sourcing mineral raw materials responsibly is important to BASF. We have implemented the E.U. Conflict Minerals Regulation. This defines supply chain due diligence for tin, tantalum, tungsten, their ores and gold (3TG) imported into the E.U. from conflict-affected and high-risk areas (CAHRAs).

In addition, BASF is committed to responsible and sustainable global supply chains for other mineral raw materials. These include **cobalt**, a key component in the production of battery materials. We have organized our cobalt supply chain according to established sustainability guidelines such as the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals. Our goal is to not purchase cobalt from artisanal mines as long as responsible labor, social and environmental standards cannot be verified.

Good to know



The mass balance approach

Many BASF value chains start in syngas plants or steam crackers, where fossil resources, mostly natural gas and naphtha, are converted into hydrogen and carbon monoxide or important basic chemicals such as ethylene and propylene. These are used to create thousands of products in the BASF Verbund.

Alongside fossil resources, we use bio-based and recycled raw materials such as bio-naphtha, biomethane or pyrolysis oil as feedstocks in the Verbund. Alternatives like these are used in place of fossil feedstocks for our mass balance products. As fossil, bio-based and recycled feedstocks are processed simultaneously, the raw materials cannot be directly physically assigned to resulting derivatives. However, with the help of monitoring and certification by independent third parties such as REDcert² or ISCC PLUS, it can be verified that an adequate amount of alternative raw materials has been used for the amount of mass balance sales product. This ensures that fossil raw materials are saved with every sale of these certified products.

Mass balance products are identical in quality to conventionally produced products but the use of alternative raw materials contributes to sustainability, for example, through fewer CO₂ emissions and lower demand for fossil raw materials. This method has already been applied to over 1,000 BASF products including engineering plastics such as polyamide, superabsorbents, dispersions and intermediates.

We share our expertise in numerous stakeholder platforms, including the European Commission's Circular Plastics Alliance, Together for Sustainability and nova-Institute's Renewable Carbon Initiative, to harmonize and standardize different attribution methods and certification schemes for mass balance products.

 For more information on the mass balance approach, see bASF.com/massbalance

Together with BMW, Samsung SDI, Samsung Electronics, Volkswagen and GIZ, we have been involved in the cross-industry Cobalt for Development initiative since 2018. It aims to improve working and living conditions for artisanal miners in the Democratic Republic of Congo. To achieve this, the initiative offers programs such as training on important environmental, social and governance aspects of responsible mining practices. Since October 2020, 14 mining cooperatives in Kolwezi have participated in training on topics such as occupational safety and environmental management. Cobalt for Development also works closely with the Good Shepherd International Foundation to create additional income opportunities for families and improve access to education.

We are also involved in various German and international initiatives to strengthen sustainability and innovation in the value chain for batteries. For example, we are a partner in a consortium led by Systemiq that has received funding of €8.2 million from the German Federal Ministry of Economics and Climate Action to develop a digital product passport for batteries. This aims to address the requirements of the E.U. Battery Regulation and both capture data that maps information about the origin of raw materials and form the basis for an efficient circular economy. Close cooperation with the Global Battery Alliance (GBA) will also ensure the global compatibility of the digital battery passport. Co-founded by BASF in 2017, the GBA has over 120 members and promotes dialog between business, governments and civil society. It aims to establish a sustainable and responsible circular economy for batteries by 2030 and is developing the tools to steer this. One of these is the Greenhouse Gas Rulebook, which the GBA unveiled in 2022. As the first framework of its kind, it contains around 80 specifications and rules for the globally harmonized – and therefore comparable – measurement of greenhouse gas emissions along the battery value chain.

Together with BMW, Mercedes Benz Group, Fairphone and Volkswagen, we have also been a member of the Responsible Lithium Partnership since 2021. It advocates for the responsible use of natural resources in Chile's Salar de Atacama, home to the world's largest lithium reserves and a significant portion of global production. As a first step, GIZ was commissioned to organize a local

multi-stakeholder platform on the water-related opportunities and risks of lithium and copper mining and other economic activities such as agriculture and tourism. The goal of the platform is to reach a common understanding on the status quo and to develop a vision for the future of the Salar de Atacama watershed together with local interest groups. In addition, potential risks are to be minimized and opportunities promoted through the development and implementation of joint action plans. BASF also participated in a study organized by BMW together with experts from the University of Alaska and the University of Massachusetts to investigate hydrological conditions in the Salar de Atacama. The results of this study are now available and will be incorporated as an important component of the Responsible Lithium Partnership's work.

Another mineral raw material that BASF processes is **mica**. As a base for effect pigments, it is mainly used in the production of coatings and seed coatings. BASF is conscious of its social responsibility with regard to mica sourcing and applies high standards, which, among other things, exclude child labor. Suppliers are asked to source mica in accordance with our Supplier Code of Conduct. As a member of the Responsible Mica Initiative (RMI), we advocate for the eradication of child labor and unacceptable working conditions, specifically in India's mica supply chain. The initiative focuses on labor standards, strengthening local communities and legal frameworks. As RMI's most recent progress report shows, activities in the relevant regions of India have already led to improved income and living conditions. These include improved access to clean drinking water through the installation of pumps and filtration systems and improved access to health care through doctors' visits in villages and enrollment in public health insurance plans.

 For more information on the Cobalt for Development project, see basi.com/cobalt-initiative and cobalt4development.com

For more information on the Global Battery Alliance, see globalbattery.org

For more information on the Responsible Mica Initiative, see responsible-mica-initiative.com

We Produce Safely and Efficiently

Protecting people and the environment is our top priority. Our core business – the development, production, processing and transportation of chemicals – demands a responsible approach. We address environmental, health and safety risks with a comprehensive Responsible Care Management System. We expect our employees and partners to know the risks of working with our products, substances and plants and to handle these responsibly.

In this section:

EHSQ Management Systems

Health and Safety, Emergency Response

Product Safety

Transportation Safety

Energy and Climate Protection

Emissions to Air, Waste and Remediation

Water

Biodiversity

Our EHSQ Management Systems

GRI 2, 3, 303, 403, 418



Safety and quality are our number one priorities. That is why we have established comprehensive management and control systems. Our Responsible Care Management System comprises the global directives, standards and procedures for environmental protection, health and safety (EHS). Our Quality Management System aims to ensure the high quality of our products, processes and services and enable our employees to best meet our customers' needs.

At a glance

115
environmental and safety audits

€270 million
invested in environmental protection plants and facilities^a

- Global EHS guidelines and standards
- Quality management with a focus on customer satisfaction
- Risk-based site audits

^a Investments comprise end-of-pipe measures as well as integrated environmental protection measures.

Responsible Care Management System

BASF is actively involved in the International Council of Chemical Associations' global Responsible Care® initiative. Our Responsible Care Management System covers the environmental protection, health and safety aspects that we have identified as material at different stages of our value chain – from the transportation of raw materials to production at our plants, activities at our sites and warehouses, and distribution of our products down to our customers' application of our products. The Environmental Protection, Health, Safety and Quality unit in the Corporate Center defines Group-wide management and control systems and monitors compliance with internal requirements and legal regulations, while the sites and Group companies implement these requirements locally. Our global network enables information and insights to be shared across the BASF Group on an ongoing basis.

Our policies and requirements are continuously updated. We also maintain dialog with government institutions, associations and international organizations for this reason. We set ourselves ambitious goals for environmental protection, health and safety (see page 36). We regularly review our performance and progress with audits. We assess the potential risks and weaknesses of all our major activities – from research and development and production to logistics – and the potential effects of these on the safety and security of our employees, plants, the environment and our surroundings. We use databases to record accidents, near misses and safety-related

incidents at our sites as well as along our transportation routes. This documentation helps us to continuously improve. Appropriate measures are derived according to specific cause analyses.

 For more information on Responsible Care®, see baf.com/en/responsible-care

Quality Management System

Our Quality Management System comprises our EHSQ policy as well as further standards, guidelines and processes for quality management along the value chain. Our Quality Management System is risk-based, process-oriented and focused on customer satisfaction. Its mandatory elements are set out in a Corporate Requirement. These include core processes such as nonconformance management, the procedure for product recalls, change management and the performance of internal audits. Local implementation of the central requirements defined by the Environmental Protection, Health, Safety and Quality unit in the Corporate Center is the responsibility of our business units and sites.

Responsible Care audits

Regular audits help ensure that our safety, security, health and environmental protection standards are met. We conduct regular audits every three to six years at all BASF sites and at companies in which BASF is a majority shareholder. We take a **risk-based approach** here. An audit database ensures that all sites and plants worldwide are regularly audited. We have defined our regulations for Responsible Care audits in a global Corporate Requirement. The Board of Executive Directors is regularly informed about the results of the audits.

Newly acquired sites and companies are generally audited for the first time after the integration phase is complete, generally within one to two years depending on complexity and size.

During our audits, we create a safety and environmental profile that shows if we are properly addressing the hazard potential. If this is not the case, we agree on corrective measures to be implemented within a certain time frame depending on the identified hazard potential. We monitor this in follow-up audits, among other things.

In the BASF Group in 2022, 115 environmental and safety audits were conducted at 73 sites (2021: 143 audits at 71 sites). The sites were audited based on their individual risk profile. Auditing of the sites acquired from Solvay started as planned in 2022 but will need to continue in 2023 due to local coronavirus restrictions. In addition, 16 sites were audited on occupational medicine and health protection (2021: 13). Online audits were conducted for four of these sites. These remote audits focused on documented processes and management systems.

 For more information on occupational and process safety and health protection, see page 125 onward

External certification

We pursue a **decentralized certification approach** for our business units and Group companies. This takes into account local needs, internal and legal requirements, and our customers' requirements.

Our Responsible Care audit system complies with the ISO 19011 standard and is certified according to ISO 9001. Worldwide, 132 BASF production sites are certified in accordance with ISO 14001 (2021: 130). In addition, 59 sites worldwide are certified in accordance with ISO 45001 (2021: 54). Several BASF sites also have an ISO 17020-accredited inspection body for user inspection or an ISO 17025-accredited analytical laboratory for environmental emissions analyses.

Based on our customers' requirements, quality management at our production sites is generally certified according to external international standards such as ISO 9001, GMP, FAMI QS or IATF 16949.

Costs and provisions

We continually invest in reducing the impact of our actions on the environment. We also establish appropriate provisions for environmental protection measures and the remediation of active and former sites.^a

 For more information, see Notes 9 and 23 on pages 229 and 266

Costs and provisions for environmental protection in the BASF Group

Million €

	2022	2021
Operating costs for environmental protection	1,305	1,133
Investments in new and improved environmental protection plants and facilities ^a	270	239
Provisions for environmental protection measures and remediation ^b	946	926

^a Investments comprise end-of-pipe measures as well as integrated environmental protection measures.

^b Values shown refer to December 31 of the respective year.



Safety is always BASF's number one priority. In addition to conventional precautions, we also use digital plant safety technologies to identify potential risks and further reduce the number of process safety incidents through predictive maintenance, for example.



Material topics in focus:

Occupational Safety, Process Safety and Health Protection

GRI 2, 3, 403, 410, 413

SUPPLIERS → BASF → CUSTOMERS

For occupational and process safety as well as health protection, we rely on comprehensive preventive measures. We count on the active involvement of all employees and contractors here. Our safety concepts are designed to provide the best possible protection for employees, contractors and our sites' neighbors, and to prevent damage to property and the environment.

At a glance

0.3

Lost-time injuries
process safety incidents per
200,000 working hours¹

0.3

Process safety incidents per
200,000 working hours¹

- Global health and safety standards
- Strengthening risk awareness and mindful behavior
- Intensive dialog on safety topics

Strategy and governance

The safety of our employees, contractors and neighbors, and protecting the environment is our top priority. That is why we set binding global standards for occupational and process safety as well as health protection. Our sites and Group companies are responsible for implementing and complying with Group-wide guidelines and local requirements. They are supported in this task by a global network of experts. The Environmental Protection,

Health, Safety and Quality unit in the Corporate Center performs regular audits to ensure compliance with the requirements.

We pursue ambitious targets for occupational and process safety as well as for health protection (see page 36). As part of our continuous improvement process, we regularly monitor progress toward our goals. We critically reviewed our occupational and process safety targets and key performance indicators in 2022. As a result, we will update our targets and report according to a new system in 2023. This will focus on high-severity work-related accidents and incidents and provide greater transparency. Our reporting continues to be based on established industry standards, with a stronger focus on people and our plants.

We document and analyze accidents and incidents as well as their causes and consequences in detail at a global level to learn from these. We see hazard assessments and the risk minimization measures derived from them as an important prevention tool.

With a culture of dealing openly with mistakes, systematic hazard assessments, division and site-specific safety activities, ongoing qualification measures and dialog across BASF's global network, we

¹ Hours worked by BASF employees, temporary employees and contractors

want to strengthen **risk awareness** among our employees and contractors, share examples of good practice and in this way, continually develop our safety culture.

Leaders are important role models for employees, which is why environmental protection, health, safety and security are discussed with newly appointed senior executives. Senior executives with a particular responsibility for such topics, for example, in production, also receive specific further training to be able to meet their responsibilities. Other events and initiatives in 2022 also focused on the high relevance of safety topics and dialog among our leaders. These included regular regional and global employee events and the "Safety call to action" initiative in North America.

Occupational safety

To prevent work-related accidents, we encourage and promote risk-conscious behavior and safe working practices, learning from incidents and regular dialog. That is why we are constantly refining and enhancing our global requirements and training.

In addition to the legally required briefings, BASF requires new employees and contractors to complete compulsory **health and safety training**. Employees at our production sites also receive regular training on the safe handling of chemicals and the correct use of personal protective equipment.

We use the number of lost-time injuries per 200,000 working hours (lost-time injury rate, LTI) as a reporting indicator. Our target is to reduce lost-time injuries to a rate of no more than 0.1 per 200,000 working hours by 2025.¹ In 2022, 0.3 work-related accidents per 200,000 working hours occurred at BASF sites worldwide (2021: 0.3). The share of chemical-related accidents increased to 8% (2021: 4%). Unfortunately, there was one fatal work-related accident in 2022 (2021: 1). At the Dachangsha site in China, an employee suffered fatal injuries while performing cleaning

activities. BASF is assisting the authorities in determining the circumstances and cause of the accident.

We do everything we can to prevent accidents and use our findings to take appropriate measures to prevent these from happening again, as far as possible. These include regular campaigns and informational events to raise employees' awareness.

2025 target¹

Reduce the worldwide
lost-time injuries
per 200,000 working hours

≤ 0.1

We actively share insights to further increase occupational safety and continually improve our processes and methods. For example, we evaluate trends in data, analyze accidents and potential incidents, and share knowledge and best practices within our global network of experts and as part of safety initiatives. We also seek dialog with government institutions and are actively involved in external occupational safety initiatives and networks around the world led, for example, by the European Chemical Industry Council (CEFIC) or national associations such as the German Chemical Industry Association and the American Chemistry Council.

 For more information on occupational safety, see baf.com/occupational_safety

Process safety

Process safety is a core part of safe, efficient and thus sustainable production. We meet high safety standards in the planning, construction and operation of our plants around the world. These meet and, in some cases, go beyond local legal requirements.

Our global requirements provide the framework for the safe construction and operation of our plants as well as the protection of

people and the environment. Our experts develop a **safety concept** for every plant that considers the key aspects of safety, health and environmental protection – from plant design to the end of the production phase – and that sets out specific safety measures.

In order to maintain the highest level of safety at our plants worldwide across their entire life cycles, we carry out implementation checks to verify that our protection concepts, safety reviews and resulting safety measures have been carried out in all our plants at timely intervals based on risk potential. We regularly update our plants' safety and security concepts, taking into particular account new findings, technological opportunities and regulatory developments.

We use the number of process safety incidents (PSI) per 200,000 working hours as a reporting indicator. We have set ourselves the goal of reducing process safety incidents to a rate of no more than 0.1 per 200,000 working hours by 2025.¹ In 2022, we recorded 0.3 process safety incidents per 200,000 working hours worldwide (2021: 0.3). We investigate every incident in detail, analyze causes and use the findings to derive suitable measures. We share the findings in our global network in the interest of continuous improvement.

2025 target¹

Reduction of worldwide
process safety incidents
per 200,000 working hours

≤ 0.1

To reduce process safety incidents, we focus in particular on technical measures, digital solutions (see box on the next page) and on a leadership culture that places even greater emphasis on process safety and dealing openly with mistakes. In addition, we are continually refining and expanding our training methods and offerings to increase risk awareness and strengthen our safety culture.

¹ Hours worked by BASF employees, temporary employees and contractors. In 2023, we will update this target and report according to a new system.

We play an active role in improving process safety around the world in internal and external networks, through our involvement in organizations such as the International Council of Chemical Associations (ICCA), the European Process Safety Centre (EPSC) and the Center for Chemical Process Safety (CCPS), and by fostering dialog with government institutions.

 For more information on process safety, see bASF.com/process_safety

Health protection

BASF's global corporate health management serves to promote and maintain the health and productivity of our employees. The BASF health checks form the foundation of our global health promotion program and are offered to employees at regular intervals. We also raise employee awareness of health topics with offerings tailored to specific target groups. One example of this is the annual Global Health Campaign, which in 2022 was dedicated to the motto "Good morning – regeneration through sleep." The program included a wide range of virtual and in-person seminars and interactive events on the different factors that influence restful sleep. Over 440 sites took part, offering events such as workshops, courses, lectures and exercises.

We measure our **performance in health protection** using the Health Performance Index (HPI). This has five components: recognized occupational diseases, medical emergency drills, first aid, preventive medicine and health promotion. Each component contributes a maximum of 0.2 to the total score, meaning that the highest possible score is 1.0. We aim to reach a value of more than 0.9 every year. With an HPI of 0.96, we once again reached this in 2022 (2021: 0.96).

In 2022, 38 work-related illnesses among BASF employees worldwide were documented as recognized occupational diseases (2021: 36). The main recognized occupational diseases are occupational asthma, hearing loss, skin diseases, musculoskeletal disorders and cancer.

We successfully continued our proven activities to combat the coronavirus pandemic in 2022, adapted in each case to local infection rates and the on-site risk. Measures included vaccination services, for example with our own vaccination center at our largest site in Ludwigshafen, Germany.

Another focus in 2022 was on influenza prevention. BASF employees could be vaccinated against the seasonal flu at many sites around the world. At the Ludwigshafen site in Germany, for example, around 6,200 employees participated in the influenza vaccination campaign.

 For more information on occupational medicine, health campaigns and the HPI, see bASF.com/health

Good to know



Digitalization in production

Numerous digital solutions and applications are used in BASF's production plants to further increase safety, security, availability and efficiency. One example is creating virtual replicas of production facilities using 3D modeling (digital twinning). This enables us to carry out maintenance and servicing work more efficiently and safely, for example, or further improve employee training. More than 30 3D models are in continuous use at BASF around the world, covering all phases of a plant's life cycle.

Digital tools are also used to access large amounts of data from different sources, intelligently link them together and prepare them for further analysis. This data is analyzed using methods like artificial intelligence (AI) and machine learning, for example, to detect and rectify anomalies relating to the plant at an early stage (predictive maintenance). This reduces unplanned repairs and downtime and optimizes the coordination of maintenance and production processes. Data can also be evaluated using AI methods to improve the production process to reduce energy use or emissions.

Emergency Response, Corporate and Cyber Security

GRI 2, 410, 413, 418

SUPPLIERS ➤ BASF ➤ CUSTOMERS

We aim to avoid safety-related incidents as far as possible with comprehensive preventive measures and clearly defined responsibilities. Should an emergency nevertheless arise, we have established structures and processes that enable effective crisis management.

Strategy and governance

We want to be as prepared as possible for crisis situations at global, regional and local level – from process safety incidents and goods spillages to pandemics and cyber attacks – through extensive emergency preparedness and emergency response regulations and measures. That is why our **emergency and crisis management** focuses on the protection of our employees, contractors and neighbors, the safety of our plants and sites, and the protection of our intellectual property. To ensure rapid and effective crisis management, we have defined appropriate structures and processes and laid them down in binding Group-wide guidelines. Our sites and Group companies are responsible for implementing and complying with these internal guidelines and the legal requirements. The Environmental Protection, Health, Safety and Quality unit in the Corporate Center conducts regular audits to monitor this.

Unusual incidents are recorded and reported centrally in accordance with a standard Group-wide procedure (e-Rapid Incident Report). This enables us to identify risks at an early stage and, if necessary, initiate appropriate relief and communication measures. All incidents are carefully followed up on to identify potential for improvement, which is integrated into existing concepts as needed.

Emergency response

Incidents are initially handled by the local crisis organization or local emergency response team. We have implemented **precautionary organizational measures** with clearly defined responsibilities and procedures at all sites for this purpose. The responsible persons receive regular training. This includes safety and emergency drills, which vary in scope and the number of people involved. Depending on the situation, we also involve business partners and our sites' communities, such as local authorities or neighboring companies, both in drills and in the event of an emergency. Additional teams may be called in for emergencies, depending on the extent of the damage and how it develops.

For example, the Global Crisis Management Support Team (GCMS), led by a member of the Board of Executive Directors, was most recently activated in connection with the coronavirus pandemic. It provides the strategic direction for crisis management and is supported by issue-specific and specialist working groups.

We are actively involved in external networks, which quickly provide information and assistance in emergencies. These include the International Chemical and Environmental (ICE) initiative and the German Transport Accident Information and Emergency Response System (TUIS), in which BASF plays a coordinating role. In 2022, we provided assistance to public emergency response agencies and other companies in 131 cases (2021: 138). This included information on chemicals and their proper disposal, on-site operational support for transportation accidents involving hazardous goods, or information on human biomonitoring. We apply the experience we have gathered to improve our own processes and set up similar systems in other countries.

For more information on emergency response, see basf.com/emergency_response

Corporate and cyber security

We protect our employees, sites, plants and company know-how against third-party interference. Cyber security and information security plays an increasingly important role here. BASF applies the "security by design" principle to critically review and optimize IT applications from a cybersecurity perspective as early as the design phase. We are continually improving our ability to prevent, detect and react to security incidents with various measures and training programs. Our global cyber security team is tasked with protecting our IT systems and the data and business processes they handle. We cooperate with experts and partners in a global network to ensure that we can protect ourselves against cyber attacks as far as possible. Our IT security management system is certified according to DIN EN ISO/IEC 27001:2017. It also supports, in particular, our critical infrastructures in meeting additional compliance requirements such as DIN EN ISO/IEC 27019:2020, IT security catalog and corresponding industry-specific standards (B3S).

Around the world, we work to sensitize our employees about protecting information and know-how. In 2022, we continued to raise employees' risk awareness with mandatory, regular online training for all employees and complementary offerings such as seminars, case studies and interactive training. These increasingly addressed aspects of working practices that have changed as a result of the coronavirus pandemic, such as cybersecurity when working from home.

Our global **network of information protection officers** comprises around 600 employees. They support the implementation of our uniform requirements and hold events and seminars on secure behaviors. Around 58,000 employees had been trained on the basics of cyber security and information protection in 2022. Our standardized Group-wide recommendations for the protection of information and knowledge were expanded in 2022 and updated in line with current developments.

Another cornerstone of corporate security is **site security**. The tasks performed by our security teams range from access controls at our sites to defense against industrial espionage. Aspects of human rights relevant to site security are a component of the global code of conduct and qualification requirements for our internal and external security personnel.

We analyze potential safety and security risks for investment projects and as part of strategic plans, define appropriate safety and security concepts. Our guiding principle is to identify risks for the company at an early stage, assess them properly and derive appropriate safeguards.

We inform business travelers and transferees about appropriate protection measures prior to and during travel in countries with elevated security risks. We continuously update our travel recommendations, for example, as a result of the coronavirus pandemic. After any major incident, we can use a standardized global travel system to locate and contact employees in the affected regions.

Product Safety

GRI 2,3,416,417

SUPPLIERS

BASF

CUSTOMERS

We see product safety as an integral part of all business processes, as an element of our risk management, and as an important pillar of our commitment to Responsible Care®. We continuously work to ensure that our products pose no risk to people or the environment when they are used responsibly and in the manner intended.

Strategy and governance

We are committed to continuously minimizing the negative effects of our products on the environment, health and safety and to the ongoing optimization of our products. This commitment to product safety is enshrined in our Responsible Care® charter and the initiatives of the International Council of Chemical Associations (ICCA). Our products should not pose any risk to humans or the environment when used responsibly and in the manner intended. We aim to comply with all relevant national and international laws and regulations.

Our global requirements define rules, processes and responsibilities, for example, to ensure uniformly high product safety standards worldwide. Our sites and Group companies are responsible for implementing and complying with internal guidelines and legal requirements. The Environmental Protection, Health, Safety and Quality unit in the Corporate Center conducts regular audits to monitor this. BASF's global network of experts shares information, insights and best practices around product safety on an ongoing basis.

Before our products are launched on the market, they undergo various tests and assessments – depending on legal requirements and their application profile. Our aim here is to identify potential hazard characteristics as well as health and environmental risks at an early stage. Based on these results, we derive precautionary and

protective measures and develop recommendations for safe handling – from production to application and disposal.

We maintain and evaluate environmental, health and safety data for all of our substances and products in a **global database**. This information is continuously updated. The database forms the basis for communicating this information in our safety data sheets, which we make available to our customers in around 40 languages. These include information on the physical/chemical, toxicological and ecotoxicological properties of products, potential hazards, first aid measures, measures to be taken in the case of accidental release, and disposal. Our global emergency hotline network enables us to provide information around the clock. To ensure that people who buy, sell, use, transport or dispose of our products can quickly find out about our products and the risks associated with them, we use the Globally Harmonized System (GHS) to classify and label our products around the world, provided this is legally permissible in the country concerned. We take into account any national or regional modifications within the GHS framework, such as the E.U.'s regulation on the classification, labeling and packaging of substances and mixtures (CLP Regulation).

If necessary, we advise our customers on product safety. We set guidelines on the safe transport of dangerous goods for our logistics service providers worldwide (see page 134). We also train our employees worldwide on the proper handling and use of selected products with particular hazard potential.

In associations and together with other manufacturers, BASF supports the establishment of voluntary global commitments to prevent the misuse of chemicals. We are also involved at national and international level in various initiatives to further develop risk assessments, such as that of the European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC).

Global chemicals regulations

Most of the products we manufacture are subject to statutory chemicals regulations. We are bound by the relevant regional and national chemicals regulations, which continue to grow in number worldwide. Examples include REACH in the E.U., UK REACH in the United Kingdom, KKDIK in Turkey, K-REACH in South Korea and TSCA in the United States. BASF Group companies work closely together with a global network of experts to ensure that BASF complies with the applicable regulations.

In Europe, the European Commission has developed a roadmap that will bring about far-reaching changes to the regulation of chemicals in Europe in the coming years: the European Green Deal and, as a part of this, the Chemicals Strategy for Sustainability (CSS). BASF supports the objectives of the Green Deal in principle but sees a need for adjustment, greater clarity and predictability, particularly in regulatory matters, to strike a balance between achieving the ambitions of the CSS and safeguarding the long-term competitiveness and future viability of the European chemical industry. As part of the ongoing clarification process, we are therefore seeking dialog with all relevant stakeholders and are advocating for a science-based and innovation-driven development of the regulatory framework.

Animal welfare in environmental and toxicological testing

Before launching products on the market, we subject them to a variety of tests, including environmental and toxicological tests using state-of-the-art knowledge and technology. If these tests include animal studies, this is generally required by law and necessary to reliably evaluate the safety and efficacy of our products. If we employ animal studies, we adhere to the specifications laid down by the German Animal Welfare Act as well as the requirements of the Association for Assessment and Accreditation of Laboratory Animal Care – the highest standard for laboratory animals in the world. We develop and are continuously optimizing alternative methods to experimentally assess the safety and tolerance of our products

without animal studies. In addition, we are involved in networks such as the European Partnership for Alternative Approaches to Animal Testing to further develop alternative methods across sectors.

Our aim is to replace, reduce or refine animal studies to minimize the impact on them. For example, we use an OECD-certified alternative testing strategy developed jointly with Givaudan for animal-free testing of allergic skin reactions. We also use other alternative methods. In 2022, BASF SE's Experimental Toxicology and Ecology became the first institute in the world to be certified for Good In Vitro Method Practices (GIVIMP). GIVIMP is a standard published by the OECD. It increases the quality of data generated by in vitro test methods and confidence in newly developed non-animal test methods.

Management of nano- and biotechnology

Nanotechnology and biotechnology offer solutions for key societal challenges – such as environmental and climate protection and health and nutrition. For example, nanomaterials can improve battery performance and biocatalytic methods can improve process resource efficiency. We want to harness the potential of both technologies. Using them safely and responsibly is our top priority. Safe handling of nanomaterials is stipulated in our Nanotechnology Code of Conduct, for instance. Two European Union-sponsored projects on assessing nanosafety – GRACIOUS and PATROLS – were completed with BASF's assistance. The results were documented and communicated in 2022 in numerous publications with BASF's involvement.

 For more information on the GRACIOUS project, see h2020gracious.eu

For more information on the PATROLS project, see patrols-h2020.eu



Drones can be used to increase safety and productivity in agriculture. The main advantages compared with conventional backpack spraying are optimized use of crop protection products, reduced risk of product contact and high efficiency in application and collection of field information.

Material topics in focus:

Product Stewardship for Crop Protection Products and Seeds

GRI 2

SUPPLIERS

BASF

CUSTOMERS

Around the world, farmers are facing enormous challenges: Under changing climatic conditions, they are expected to produce healthy and affordable food for a growing world population – and at the same time, reduce carbon emissions, minimize land consumption and preserve biodiversity. Our products and technologies help them master this complex task.

As global demand for agricultural products and solutions grows, so does the pressure on farmers. They need to produce more and are expected to simultaneously reduce their environmental footprint. With our integrated offer, we help farmers find the right balance between economic, environmental and societal demands. High-performance seeds from BASF offer benefits such as a higher yield, better quality and greater resilience against environmental influences like drought. Our innovative crop protection products reduce crop losses caused by insect pests, weeds and fungal diseases. Our digital solutions enable, among other things, better soil management and more targeted use of fertilizers and crop protection products by taking important parameters such as plant health, weed density or weather data directly into account during application.

In 2022, we invested €944 million in research and development in the Agricultural Solutions segment, which represents 9% of segment sales. Our well-filled innovation pipeline has a peak sales potential of more than €7.5 billion for products launched by 2032. The main focus here is sustainability, with four key areas: climate-smart farming, sustainable solutions, digital farming and smart stewardship (see box on page 34).

Strategy

We are continuously improving our farming solutions. Alongside aspects such as efficacy and productivity, this also includes safe application by our customers and impact on the environment.

Crop protection products and seeds are highly regulated at national and international level, which brings with it strict requirements for registering and re-registering active ingredients and crop systems. Regulatory approval is only granted when extensive documentation can be provided showing that our products are safe for people, animals and the environment when used in the manner intended.

As a member of the CropLife International industry association, we are committed to complying with the standards on the research, registration and distribution of crop protection products set out in the International Code of Conduct on Pesticide Management issued by the Food and Agriculture Organization (FAO). In our use of biotechnology, we are guided by the code of conduct set out by EuropaBio, the European biotechnology association, and adhere to the relevant standards and legal regulations governing production and marketing.

Potential risks of our products are assessed and minimized throughout the research, development and registration process, and on an ongoing basis following market registration. We regularly conduct scientific studies and tests, including on modes of action, (eco)toxicological properties and possible residues. This ensures that, as far as possible, our registration dossiers address all questions on potential environmental and health effects.

We adapt our portfolio to the specific requirements of regional markets as customer requirements, crops, soils, climate conditions, plant diseases and farming practices vary around the world. Consequently, product approvals differ from country to country. Distribution generally requires registration and approval of our products in accordance with the respective national regulations.

Crop protection

BASF adheres to the International Code of Conduct issued by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) for the distribution of crop protection products. These are only marketed once they have been approved by the relevant authorities. We no longer sell WHO Class 1A or 1B products (high acute oral and dermal toxicity), even if formal approvals exist. Depending on availability, we offer our customers alternatives.

All of BASF's crop protection products can be used safely under local farming conditions if the information and directions on the label are followed. If they have any questions, complaints or issues, our customers can contact us through various channels, for example, by calling the telephone number printed on all product labels, using the contact forms on our websites or by approaching our sales employees directly. We record all product incidents relating to health or the environment that come to our attention in a global database. If necessary, we take appropriate measures on the basis of this information to minimize preventable incidents. These include updating the instructions for use on product labels. We communicate

these changes and general recommendations on the safe use of our products through channels such as our Farmer Field School initiatives in Asia and in training programs such as the On Target Application Academy in the United States.

One of the ways we meet our **commitment to product stewardship** is by offering a wide range of courses and training on the safe storage, handling, use and disposal of our products. This ranges from on-site events to handouts and digital offerings and is aimed at farmers, retailers, consultants and other users. In India, for example, BASF launched the Suraksha Hamesha program. Suraksha Hamesha means "safety all the time." The program creates a platform for educating farmers and other users of crop protection products about the nine steps of responsible use of crop protection products and personal protection. Through Suraksha Hamesha, BASF has trained over 189,000 agricultural workers and around 39,000 users across India since 2016. BASF also involves government agencies and the central government's farm extension teams in these meetings to support and promote farm safety. In addition, digital initiatives reached around 17 million farmers in India and informed them about safety in agriculture.

BASF also promotes new application technologies: In China, for example, more than 1,000 drone pilots were trained in the safe use of crop protection products as part of the Fly with BASF program in 2022.

We also work closely together with associations such as CropLife International and CropLife Europe to promote the safe and proper use of crop protection products. For example, we support stewardship initiatives of both associations and various programs on the proper disposal and recycling of product containers. Technological innovations developed together with industry partners also help to make using crop protection products easier and safer. Examples include the closed transfer systems easyconnect in Europe and the Wisdom system in South America.

Seeds

Our biotechnology activities and our research and development capabilities comprise advanced breeding techniques, analytics, technology platforms and trait validation. To offer tailor-made, more sustainable crop solutions, our gene identification work focuses on those plant characteristics that enable higher yield and better quality, disease resistance and tolerance of environmental factors such as drought. We apply state-of-the-art scientific methods here such as genetic engineering and selective genome editing.

BASF is a member of Excellence Through Stewardship (ETS), a global industry initiative for seeds. This initiative promotes the adoption of quality management systems for seeds and product stewardship programs covering the entire life cycle. It also has independent auditors verify compliance with its guidelines. In 2022, BASF successfully passed ETS audits on laboratory operations, contained biotech facilities, general stewardship, incident response management and product handling at the Research Triangle Park and Pikeville sites in the United States, Trindade and Primavera do Leste in Brazil, and Bogotá in Colombia.

 For more information on our Agricultural Solutions segment, see page [88](#) onward

 For more information on biodiversity, see page [147](#) onward

 For more information on risks from litigation and claims, see Note 24 to the Consolidated Financial Statements on page [268](#)

Transportation Safety

GRI

2,306



Our regulations and measures for transportation safety are part of our Responsible Care Management System. These cover the delivery of raw materials, the handling and distribution of chemical products between BASF sites, warehouses and customers, and the transportation of waste.

At a glance

Zero

Transportation incidents with significant impact on the environment

- Risk minimization along the entire transportation chain
- Risk assessment based on national and international dangerous goods regulations
- Regular review of logistics service providers

Strategy and governance

Whether by road, rail, ship or air, we want to ensure that our products are loaded, transported and handled in accordance with the relevant regulations and their hazard potential. That is why we depend on global standards, an effective organization, training and reliable logistics partners. Our goal is to **minimize risks** along the entire transportation chain.

All BASF products intended for transport must be clearly identifiable, classified, securely packaged and labeled. The transportation of dangerous goods is subject to mandatory national and international dangerous goods regulations as well as our global guidelines. Our sites and Group companies are responsible for implementing

transportation safety regulations and guidelines. Compliance is regularly monitored by the Environmental Protection, Health, Safety and Quality unit in the Corporate Center using globally standardized transportation safety reviews. External logistics partners are evaluated based on risk either through assessments or on-site audits.

Our global network of BASF experts trains the responsible leaders and their employees on transporting dangerous goods. This network also ensures that information, insights and best practices are shared on an ongoing basis.

Preventive safety measures

National and international dangerous goods regulations are based on an assessment of transportation risks and define rules and measures for safely transporting dangerous goods. We use various tools to minimize transportation risks. For example, for every dangerous good to be transported, we check in each case whether the packaging has been approved for that product and is suitable for the type of transport. We conduct digital dangerous goods checks before shipping orders are released. In addition, vehicles are subjected to a thorough dangerous goods check prior to loading and rejected if there are any issues.

Above and beyond this, we use our global requirement to specifically assess the safety and environmental risks of transporting and handling raw materials and sales products with high hazard potential. This is based on the Guidance on Safety Risk Assessment for Chemical Transport Operations published by the European Chemical Industry Council (CEFIC).

We stipulate worldwide requirements for our logistics service providers and assess them in terms of safety and quality. Our experts use our own tools as well as internationally approved schemes for evaluation and monitoring. These include the ship

inspection reports issued by the Chemical Distribution Institute (CDI) and the Oil Companies International Marine Forum (OCIMF).

Transportation incidents

To evaluate transportation safety, we systematically record transportation incidents according to defined criteria. We use the number of transportation incidents¹ as a reporting indicator. In 2022, we recorded 25 transportation incidents worldwide (2021: 21).

A particular focus is incidents involving goods spillages that could lead to significant environmental impacts. These include dangerous goods leaks in excess of 200 kilograms on public traffic routes, provided transport was arranged by BASF. We recorded one incident in 2022 with spillage of more than 200 kilograms of dangerous goods² (2021: 3). This incident did not have a significant impact on the environment (2021: 0).

For more information on transportation safety, see basf.com/distribution_safety

¹ Data is collected based on the International Council of Chemical Association's (ICCA) guidance for reporting performance and includes road, rail and container shipping incidents.

² Hazardous goods are classified in accordance with national and international hazardous goods regulations.

Energy and Climate Protection

GRI 2, 3, 201, 302, 304, 305



As an energy-intensive company, we take responsibility for the efficient use of energy and global climate protection. We are committed to the Paris Climate Agreement. Our products and solutions enable a reduction in greenhouse gas emissions in many areas. At the same time, we are working to significantly reduce our own carbon footprint.

At a glance

18.4 million metric tons

Greenhouse gas emissions¹

2.3 TWh

Renewable electricity

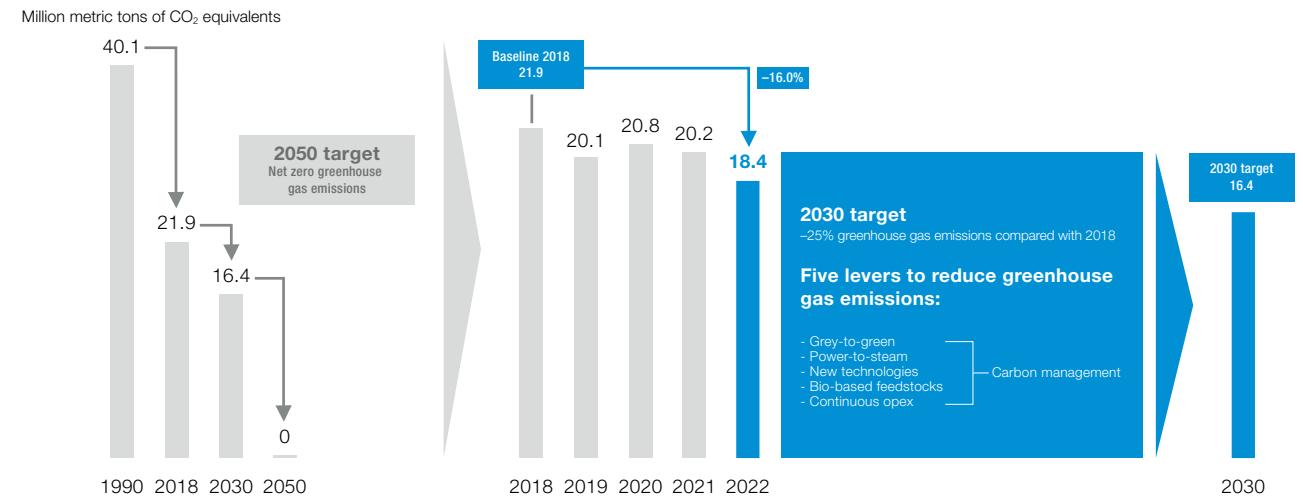
- Corporate and Product Carbon Footprints create transparency
- Ambitious emission reduction targets
- Net Zero Accelerator unit bundles and accelerates projects
- Supplier CO₂ Management Program

Strategy and governance

Climate protection is very important to us and is an important part of our corporate strategy. We are pursuing ambitious climate protection targets (see "Global targets"), which we aim to achieve with comprehensive carbon management. This includes **five levers to reduce our greenhouse gas emissions and demand for fossil fuel:**

- **Grey-to-green:** We are increasingly meeting our electricity needs from renewable sources (see "Energy supply").

Schematic overview: Development of the BASF Group's greenhouse gas emissions (Scope 1 and 2)¹



– **Power-to-steam:** In the future, we will increasingly rely on electrical steam generation and in this way, also tap previously unused waste heat potential (see "Energy supply").

– **New technologies:** We are developing completely new carbon-free and low-carbon processes and technologies for climate-smart chemistry (see box on page 141).

– **Bio-based feedstocks:** We are increasingly replacing fossil resources with alternative raw materials (see "Raw Materials").

– **Continuous opex:** Our operational excellence activities continually improve the energy and process efficiency of our plants (see "Energy efficiency").

We only consider external offsetting measures as a temporary stop-gap if our activities do not make the desired contribution to reducing emissions.

By 2030, we plan to invest up to €4 billion to achieve our climate protection targets.

We have established **organizational structures** to implement our climate protection targets and carbon management activities with even greater focus and speed: The Environmental Protection, Health, Safety and Quality unit in the Corporate Center develops Group-wide guidelines and requirements for collecting emissions and energy data and for energy management. It conducts regular audits to monitor the implementation of and compliance with internal guidelines and legal requirements by our sites and Group companies. The Corporate Strategy & Sustainability unit develops and tracks the BASF Group's climate targets and strategic levers for achieving them based on our corporate carbon footprint. The Net Zero Accelerator unit, which was established in early 2022, focuses on the accelerated implementation of existing and new cross-divisional projects to reduce emissions. The emphasis is on carbon-free and low-carbon production technologies (see page 141), the circular economy (see page 43) and renewable energies (see "Energy

¹ Scope 1 and Scope 2 (excluding the sale of energy to third parties, including offsetting). The target includes greenhouse gases according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents (CO₂e).

supply"). Both Corporate Strategy & Sustainability and Net Zero Accelerator report to the Chairman of the Board of Executive Directors. This integrates climate protection-relevant aspects into strategic decision-making processes and core business activities (see page 47). In parallel, our operating divisions are working on divisional-specific projects to reduce emissions. They are supported here by the global service units.

We report on greenhouse gas emissions in accordance with the Greenhouse Gas Protocol as well as the sector-specific standard for the chemical industry. We consistently align our actions with our climate protection targets, based on a comprehensive analysis of our emissions. Group-wide CO₂ emissions are anchored in the BASF Group's steering and compensation systems as a most important nonfinancial key performance indicator, giving them even more weight. Steering also includes assessing investments and acquisitions with regard to their impact on our climate protection targets.

We are gradually integrating our suppliers into the management of greenhouse gas emissions along the value chain. To this end, we launched the Supplier CO₂ Management Program in 2021 (see "Product Carbon Footprints").

We offer our customers solutions that help prevent greenhouse gas emissions, and improve energy and resource efficiency. To increase transparency for our customers and target our CO₂ reduction measures to those areas where they bring the greatest added value, we continuously determine the Product Carbon Footprint for around 45,000 sales products (see "Product Carbon Footprints").

We continuously analyze potential risks to our business operations arising in connection with the topics of energy and climate protection and derive appropriate measures. We support the recommendations of the **Task Force on Climate-related Financial Disclosures** (TCFD). Since the 2019 reporting year, BASF's annual report has included an overview showing the sections and subsections in

which TCFD-relevant information can be found (see page 19). We also participate in the program established by the international nonprofit organization **CDP** for reporting on data relevant to climate protection and have done so since 2004. BASF again achieved a score of A- in CDP's 2022 climate change questionnaire, maintaining its Leadership status. Companies on the Leadership level are distinguished by factors such as the completeness and transparency of their reporting. They also pursue comprehensive approaches in managing the opportunities and risks associated with climate change as well as strategies to achieve company-wide emission reduction goals.

All parts of society must work together to effectively protect the climate. This is why we support various national and international initiatives and are involved in partnerships. For example, in 2022 we provided funding to help the Science Based Targets (SBTi) initiative launch a project to derive science-based climate protection targets for the chemical sector, in which we are also involved as a member of an advisory group. As part of Together for Sustainability, in 2022 we were involved in the creation of a uniform guideline for calculating the carbon footprint of products in the chemical industry (see "Product Carbon Footprints").

 For more information on climate protection and carbon management, see bASF.com/climate_protection

For more information on the CDP climate change questionnaire, see bASF.com/en/cdp

Global targets

Compared with the 2018 baseline, we want to reduce greenhouse gas emissions from our production sites and our energy purchases by 25% by 2030.¹ This means that we aim to reduce greenhouse gas emissions from 21.9 million metric tons to 16.4 million metric tons – despite our growth plans and the construction of a new Verbund site in southern China. This corresponds to a decrease of around 60% compared with 1990. Our long-term goal is net zero greenhouse gas emissions by 2050.¹

2030 and 2050 targets

-25%

Reduction in our absolute
greenhouse gas emissions
by 2030 compared with 2018
(Scope 1 and 2)^a

Net zero

Greenhouse gas emissions
by 2050
(Scope 1 and 2)^a

a BASF operations excluding sale of energy to third parties, including offsetting

The BASF Group's emissions reported under these targets in 2022 amounted to 18.4 million metric tons of CO₂ equivalents (2021: 20.2 million metric tons). The increase in natural gas prices in Europe due to the war in Ukraine, weaker demand due to a slowing economy over the course of the year and several lockdowns in China led to a significant reduction in production volumes and, as a result, emissions in 2022. This particularly affected the emissions-intensive ammonia value chain. The share of electricity from renewable sources was kept roughly constant compared with the previous year and, together with measures to increase energy and process efficiency, made a relevant contribution to reducing emissions.

 For more information on climate protection, see page 27

A projection of greenhouse gas emissions in 2023 can be found in the forecast from page 154 onward

¹ Scope 1 and Scope 2 (excluding the sale of energy to third parties, including offsetting). The target includes greenhouse gases according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents (CO₂e).

Energy supply

Our total energy consumption was 52.9 million MWh in 2022 (2021: 58.8 million Mwh), significantly below the prior-year figure due to the lower production levels. Total energy consumption includes fuel demand in our own central power and steam generation plants, primary energy requirements in our process plants, and net power and steam imports.

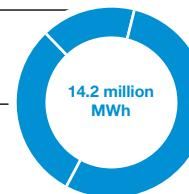
To generate our own steam and power, we mainly use natural gas (77.4%) and substitute fuels (17.5%). The latter are residues from chemical production plants that cannot be reused in the BASF Verbund. In 2022, we covered more than 54% of our electricity demand with our own gas and steam turbines in highly efficient combined heat and power plants. Combined heat and power generation reduces the carbon footprint of our energy production and simultaneously ensures that fuels are used as efficiently as possible: For instance, compared with separate methods of generating steam and electricity, we saved 12.0 million MWh of fossil fuels and avoided 2.4 million metric tons of carbon emissions in 2022. To achieve the highest possible energy yield with the lowest possible greenhouse gas emissions, we continuously invest in our combined heat and power plants. In 2022, internally generated power in the BASF Group had a carbon footprint of around 0.25 metric tons of CO₂ per MWh of electricity and was below the national grid factor at most BASF sites.

The **Verbund system** is also key to carbon-optimized energy supply at our sites. It helps us realize synergies and manage value chains in a resource-efficient way. For example, waste heat from one plant's production process is used as energy in other plants. The Verbund saved us around 19.0 million MWh in 2022, which translates to 3.8 million metric tons less CO₂ released into the environment. With combined power and steam generation as well as our continuously optimized Energy Verbund, we were thus able to avoid a total of 6.2 million metric tons of carbon emissions in 2022. That is why we will continue to invest in the creation and optimization of Verbund structures and drive forward the consolidation of production at highly efficient sites.

Energy supply of the BASF Group 2022

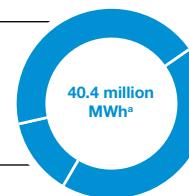
Electricity supply^a

16%	Renewable (internally generated + purchased)
30%	Nonrenewable (purchased)
54%	Nonrenewable (internally generated)



Steam supply

44%	Waste heat
13%	Purchased (nonrenewable)
43%	Internally generated



^a Conversion factor: 0.75 MWh per metric ton of steam

A core component in reducing our greenhouse gas emissions is the gradual conversion of our energy supply from fossil to renewable sources as part of our carbon management. This mainly affects our electricity supply (**grey-to-green lever**). In 2022, electricity from renewable sources as a share of total electricity consumption could be kept constant at 16% (2021: 16%). Our electricity requirements will increase significantly in the coming years due to the planned electrification of our steam generation and the gradual switch from natural gas-based to electricity-based, low-carbon production processes, for example in our steam crackers (see page 141). We aim to source more than 60% of our power needs from renewable sources by 2030. Based on our growth forecast, this is roughly equivalent to our total power demand in 2021.

In the transformation of our power supply, we are pursuing a **make & buy approach**. Firstly, BASF is investing in its own

Fossil fuels and residual fuels used in the BASF Group's central power and steam generation plants

77.4% Natural gas
26.1 million MWh

2.4% Heating oil
0.8 million MWh

2.7% Coal
0.9 million MWh

17.5% Substitute fuels
5.9 million MWh

Total: 33.7 million MWh

renewable power assets, particularly offshore wind farms. Secondly, BASF will purchase green power on the market through long-term supply agreements with plant operators, green power agreements or renewable energy certificates, depending on the region and market regulations. A key purchasing criterion is the "additionality" of the electricity purchased. This means that electricity is primarily sourced from new renewable energy facilities.

In 2022, we successfully drove forward the transformation of our power supply. Work on the Hollandse Kust Zuid offshore wind farm, a joint project with Vattenfall and Allianz, is proceeding according to plan. The offshore wind farm should be fully operational in 2023. With 140 turbines and a capacity of 1.5 gigawatts, Hollandse Kust Zuid will then be one of the largest subsidy-free offshore wind farms in the world. Our new solar power plant at the Schwarzeide site in Germany went online at the end of August 2022. We operate it

Additional indicators for energy and climate protection in BASF operations

	2022	2021	2018 (baseline)
Specific greenhouse gas emissions ^a (metric tons of CO ₂ equivalents per metric ton of sales product ^b)	0.577	0.564	0.577
Primary energy demand ^c (million MWh)	54,206	57,627	60,586
Energy efficiency (kilograms of sales product ^b per MWh)	589	621	626

^a Scope 1 and Scope 2 (market-based) according to the GHG Protocol, excluding emissions from the generation of steam and electricity for sale to third parties, including offsetting.

^b Sales product volumes include sales between BASF Group companies; merchandise is not taken into account.

^c Primary energy used in BASF's plants as well as in the plants of our energy suppliers to cover energy demand for production processes. Purchased renewable energy has a primary energy conversion efficiency rate of 100%.

jointly with envia Mitteldeutsche Energie AG (enviaM). Most of the electricity generated (expected electricity production: 25 GWh per year) will be used to supply the Schwarzeide site and cover around 10% of the site's current annual electricity demand on average.

In addition to these cooperative ventures, in 2022 we concluded further long-term supply agreements for green power. In North America, for example, we have secured around 250 megawatts of wind and solar generation capacity through virtual power purchase agreements with Dawn Solar and EDF Energy Services. BASF has also signed a 12-year supply agreement with X-ELIO to supply 48 megawatts of solar power to the Freeport site in Texas. In China, we initiated further long-term supply agreements for green power with the State Power Investment Corporation and Brookfield, including for our new Verbund site in Zhanjiang, which is currently under construction. Our aim is to supply the site entirely with electricity from renewable sources from the start-up phase of the large-scale plants in 2025 – much earlier than originally planned.

In some regions, we have also acquired green power certificates. The aim is to gradually replace these temporary measures with our own power assets or long-term supply agreements.

In total, over 108 sites worldwide were already partially or fully powered by renewable energy at the end of 2022 (2021: 88). The carbon footprint of purchased electricity in 2022 was around

0.24 metric tons of CO₂/MWh (market-based approach), slightly above the previous year's level (0.21 metric tons CO₂/MWh).

The second lever for reducing greenhouse gas emissions in our energy supply starts with the production of steam (**power-to-steam lever**). In the future, new technologies should make a significant contribution to reducing CO₂, for example by recovering energy from the waste heat of our production and infrastructure facilities. To explore the potential of various technologies, in 2022, for example, we initiated a joint feasibility study with MAN Energy Solutions on the construction of an industrial-scale heat pump at the Ludwigshafen site in Germany. This could generate up to 150 metric tons of steam per hour from previously unused wastewater heat, reducing the site's CO₂ emissions by up to 390,000 metric tons per year.

Energy efficiency and specific greenhouse gas emissions

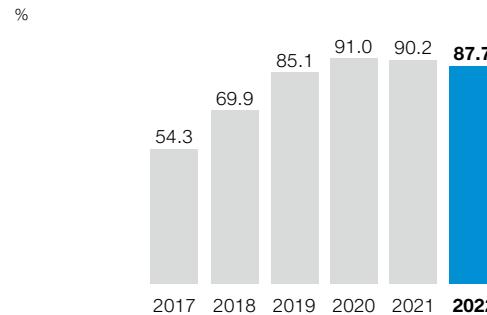
Energy use and greenhouse gas emissions are closely linked to capacity utilization at our plants as well as our product portfolio. Specific greenhouse gas emissions in 2022 amounted to 0.577 metric tons of CO₂ equivalents per metric ton of sales product,¹ an increase of 2.3% compared with the previous year (2021: 0.564 metric tons of CO₂ equivalents per metric ton of sales product). This was mainly due to lower and less uniform capacity utilization at our plants compared with the previous year, which led

to reduced plant efficiency. By contrast, the use of renewable energy had a positive impact on specific greenhouse gas emissions.

Since 1990, we have been able to lower our overall greenhouse gas emissions from BASF operations by 54.1% and even reduce specific emissions (per metric ton of sales product) by 74.8%.

As part of our carbon management, we aim to make our plants and processes even more efficient and resource saving (**continuous opex lever**). Certified energy management systems according to DIN EN ISO 50001 at all relevant production sites² play a particularly important role here. These help us 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 our competitiveness. In 2022, 76 production sites worldwide had certified energy management systems, representing 87.7% of our primary energy demand.

Certified energy management systems (ISO 50001) at BASF Group sites worldwide, in terms of 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 examples of best practices.

¹ Sales product volumes include sales between BASF Group companies; merchandise is not taken into account.

² Relevant sites are selected based on the amount of primary energy used and local energy prices.

In 2022, we implemented more than 500 measures to reduce energy and resource consumption and increase our competitiveness. At the Chongqing site in China, for example, modifications to the wastewater treatment process reduced heat demand and the resulting emissions by more than 2,500 metric tons of CO₂ per year. At a plant at the Kuantan site in Malaysia, an optimized control system allowed existing flash steam to be fully utilized, reducing additional steam demand. This enables an emissions reduction of over 1,500 metric tons of CO₂ per year. At the Ludwigshafen site in Germany, the innovative design of a new residue incineration line enables the more efficient use of combustion heat to produce steam. This avoids more than 5,000 metric tons of CO₂ emissions every year.

Our employees' ideas are an important source of optimization. Award-winning suggestions for improvements implemented in 2022 will enable us to save around 9,000 metric tons of CO₂ per year at the Ludwigshafen site in Germany alone.

Corporate carbon footprint

BASF has published a comprehensive corporate carbon footprint every year since 2008. This reports on all emissions along the value chain – from raw materials extraction to production and disposal. We are continually working to reduce greenhouse gas emissions both in our own production and, together with our partners, along the value chain (see "Strategy and governance").

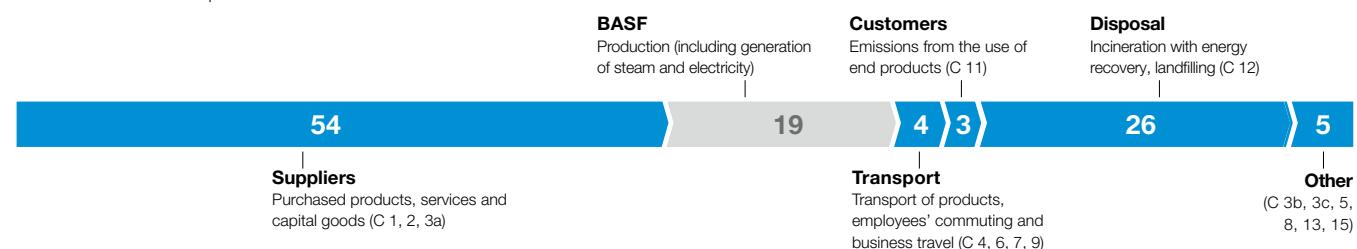
In 2022, our greenhouse gas emissions according to the Greenhouse Gas Protocol, including **Scope 1 and Scope 2** emissions (market-based approach, including sales of energy to third parties) were 19.185 million metric tons of CO₂ equivalents (2021: 21.131 million metric tons). Of this amount, 86% were Scope 1 emissions (2021: 88%) and 14% were Scope 2 emissions (2021: 12%). Carbon dioxide was by far the largest component and accounted for 98% of emissions (2021: 98%).

Scope 3 greenhouse gas emissions arising upstream and downstream of our operations in the value chain are calculated in accordance with the Corporate Value Chain (Scope 3) Accounting and Reporting Standard published by the Greenhouse Gas Protocol and the WBCSD Guidance for Accounting and Reporting Corporate GHG Emissions in the Chemical Sector Value Chain (WBCSD Chemicals). Both standards involve the use of values from general databases. For 2022, we calculated Scope 3 emissions of around 92 million metric tons of CO₂ equivalents (2021: 101 million metric tons). There was a significant reduction in total emissions along the BASF value chain in 2022 due to lower production volumes.

Our supply chain made the largest contribution to Scope 3 in 2022, with 54 million metric tons of CO₂ equivalents (2021: 59 million metric tons). To calculate these upstream greenhouse gas emissions, we used information on the carbon footprint of raw materials, primarily from external databases. We intend to gradually replace this with data from our Supplier CO₂ Management Program. In 2022, we were involved in the creation of new Together for Sustainability (TfS) recommendations for determining supply chain emissions to improve reporting transparency and consistency across the industry (see page 141).

Scope 3 emissions along the BASF value chain in 2022^a

Million metric tons of CO₂ equivalents



BASF Group's greenhouse gas emissions according to the Greenhouse Gas Protocol^aMillion metric tons of CO₂ equivalents**BASF operations**

	2022	2021	2018 (baseline)
Scope 1 ^b			
CO ₂ (carbon dioxide)	15.434	17.234	17.025
N ₂ O (nitrous oxide)	0.306	0.418	0.677
CH ₄ (methane)	0.025	0.032 ^c	0.027
HFC (hydrofluorocarbons)	0.031	0.035 ^c	0.091
SF ₆ (sulfur hexafluoride)	0.001	0.001	0
Scope 2 ^d			
CO ₂	2.629	2.464	4.067
Total	18.426	20.184 ^c	21.887
Offsetting	0	0	0
Total after offsetting	18.426	20.184^c	21.887
Sale of energy to third parties (Scope 1) ^e			
CO ₂	0.759	0.947	0.773
Total	19.185	21.131^c	22.660
Use of biomass^f			
CO ₂	0.084	0.091	n/a

^a BASF reports separately on direct and indirect emissions from the purchase of energy. Scope 1 emissions encompass both direct emissions from production and generation of steam and electricity, as well as direct emissions from the generation of steam and electricity for sale. Scope 2 emissions comprise indirect emissions from the purchase of energy for BASF's use.

^b Emissions of N₂O, CH₄ and HFC have been translated into CO₂ emissions using the Global Warming Potential, or GWP, factor. GWP factors are based on the Intergovernmental Panel on Climate Change (IPCC) 2007, errata table 2012 for the 2018 reporting year, and IPCC 2014 for the 2021 and 2022 reporting years. HFC (hydrofluorocarbons) are calculated using the GWP factors of the individual components.

^c The comparative figure for 2021 has been adjusted to reflect updated data.

^d Market-based approach. Under the location-based approach, Scope 2 emissions were 3.670 million metric tons of CO₂ in 2021 and 3.588 million metric tons of CO₂ in 2022.

^e Includes sales to BASF Group companies; as a result, emissions reported under Scope 2 can be considered twice in some cases.

^f Emissions are reported separately from Scope 1 and Scope 2 in accordance with the Greenhouse Gas Protocol.

The disposal of our products accounted for 26 million metric tons of CO₂ equivalents (2021: 28 million metric tons), the second-largest share of our Scope 3 emissions. This figure is based on assumptions about the disposal of products at the end of the value chain.

For more information on our emissions reporting, see bASF.com/corporate_carbon_footprint

For more information on Product Carbon Footprints, see bASF.com/en/pcf

Product Carbon Footprints

In 2020, we developed a digital solution to make our product-specific greenhouse gas emissions more transparent and have since determined the carbon footprints of around 45,000 sales products. These Product Carbon Footprints (PCFs) include all greenhouse gas emissions – from raw materials extraction to the finished product leaving the factory gates ("cradle-to-gate"). PCFs provide us with important information for assessing the climate impact of our products and guidance for implementing mitigation

measures so that our customers can benefit from reduced carbon emissions in the value chain.

In 2022, we further expanded our portfolio of products with a certified reduced carbon footprint, including engineering plastics and polyurethanes, intermediates and aroma ingredients. We already offer some of our products, such as the intermediates neopentyl glycol (see page 72) and propionic acid, and the isocyanate MDI, with a net zero carbon footprint. These lower PCFs are mostly made possible by the substitution of fossil raw materials. For instance, we use climate-neutral electricity from renewable sources instead of electricity from fossil fuels to produce **low-PCF and zero-PCF products**. We also use – in whole or in part – renewable, waste-based or recycled raw materials such as palm oil, castor oil, biomethane or pyrolysis oil from plastic waste. These alternative resources have a better carbon footprint than fossil raw materials. The alternative resources are allocated to the end product using the mass balance approach (see box on page 121).

The digital methodology we have developed to calculate PCFs meets general life cycle analysis standards such as ISO 14040, ISO 14044 and ISO 14067, as well as the Greenhouse Gas Protocol Product Standard, and has been certified by TÜV Rheinland. We make our automated PCF calculation approach available to interested industry players through partnerships. At the same time, we are involved in various initiatives to drive transparency, harmonization and standardization across the industry. One example is Together for Sustainability (see box on page 116). In September 2022, the members of the initiative agreed on a globally uniform guideline for calculating cradle-to-gate PCFs in the chemical industry. This will enable the climate impact of products to be directly compared and evaluated in the future based on a standardized approach. A technical solution for sharing PCF data between companies is under development and should be implemented by the end of 2023.

Harmonizing the methodological approaches used to calculate PCFs also makes an important contribution to the more accurate measurement of the greenhouse gas emissions that arise in the

supply chain, for example, during the extraction of raw materials or the manufacture of precursors. These upstream Scope 3 emissions account for the largest share of our corporate carbon footprint (see page 139).

We currently use industrial averages and values from commercial databases as the basis for calculating upstream Scope 3 emissions. To obtain a more accurate data base and better manage and reduce emissions in the supply chain in the long term, we launched our global **Supplier CO₂ Management Program** in 2021. In a first step, we have since requested the PCFs of our raw materials and support our suppliers in determining these, for example, by sharing our knowledge of valuation and calculation methods with them. Since the start of the program, we have asked more than 1,300 suppliers, covering around 60% of our raw materials-related greenhouse gas emissions. In a second step, we want to work with our suppliers on solutions to reduce product-related emissions and establish the PCF as a criterion for purchasing decisions.

For more information on the Supplier CO₂ Management Program, see baf.com/suppliers

Good to know



Low-carbon and carbon-free processes for climate-smart chemistry

We are also developing completely new technologies for carbon-free and low-carbon production as part of our carbon management (new technologies lever). The main focus here is on basic chemicals, which are often still emissions-intensive to produce. One example is steam reforming, the most common way of obtaining hydrogen. We are already testing an alternative process – methane pyrolysis – in Ludwigshafen, Germany. This is virtually carbon-free if renewable energy is used and extremely energy efficient compared with other methods. Together with Siemens Energy, and depending on funding from the German Federal Ministry for Economic Affairs and Climate Action (BMWK), we are also planning to build a proton exchange membrane (PEM) water electrolyzer in Ludwigshafen with an output of 54 megawatts for carbon-free hydrogen production.

Another example is steam crackers. Steam crackers split petroleum into olefins and aromatics for further processing – both important groups of substances for numerous chemical value chains. The cracking reaction requires high temperatures of around 850 degrees Celsius, which are achieved in conventional plants by burning methane. Heating concepts that use electricity from renewable sources instead could reduce process-related emissions by at least 90% in the future. To test the feasibility of this new process and two different heating concepts, in September 2022 we started construction of a demonstration plant at the

Ludwigshafen site in Germany together with our partners SABIC and Linde. The project has been granted €14.8 million from the BMWK under the Decarbonization in Industry funding program. It is scheduled for start-up in 2023.

We also want to break new ground in steam supply, which we need for many chemical processes and have so far mainly produced in our central gas-fired power plants. Here, too, green power-based technologies such as heat pumps or electric boilers offer enormous potential. For instance, we want to recover the thermal energy produced by our production and infrastructure facilities in the future and use it for carbon-optimized steam generation. In this context, we initiated a feasibility study with MAN Energy Solutions in July 2022 on the construction of an industrial-scale heat pump at the Ludwigshafen site in Germany (see page 138).

Another focus area is carbon capture and storage (CCS). For example, we are part of an industrial CCS project at the Antwerp site in Belgium (Kairos@C) as the first phase of the Antwerp@C project, which will enable BASF to avoid the emission of up to 1 million metric tons of CO₂ into the atmosphere every year from production.



In 2022, a new residue incineration line was commissioned in Ludwigshafen, Germany. It makes an important contribution to reliable waste disposal and is also interesting from a technological point of view: An upright, cooled combustion chamber increases the efficiency by 10%. This means that the additional steam fed into the Verbund does not have to be generated by burning natural gas.

Material topics in focus:

Emissions to Air, Waste and Remediation

GRI 2, 3, 305, 306



We want to continuously reduce emissions to air, prevent waste and protect the soil. That is why we are committed to operating our plants safely and efficiently, and to using resources responsibly. We are consistently reducing the environmental impact of our plants and processes with our Operational Excellence Program.

At a glance

2.2 million metric tons
BASF Group waste

47.4%
share of our waste recycled or thermally recovered

- Improvements based on continuous monitoring of emissions to air and waste streams
- Circular concepts an important part of our activities
- Systematic management of contaminated sites

Strategy and governance

The safe and efficient operation of our plants and the responsible management of resources and waste are core elements of our Responsible Care Management system. We have defined our global standards for emissions to air, waste and contaminated sites in Group-wide guidelines, the implementation of which is the responsibility of the sites and Group companies. The Environmental Protection, Health, Safety and Quality unit in the Corporate Center conducts regular audits to monitor compliance with legal requirements and internal guidelines.

BASF's global network of experts shares information, insights and best practices on an ongoing basis to further reduce our emissions to air, manage waste and responsibly handle contaminated sites.

Continuous documentation and monitoring of emissions to air, waste streams and contaminated sites as well as the implementation of measures for improvement are an integral part of our environmental management. In addition to greenhouse gases (see page 135 onward), we also measure and analyze other air pollutants to prevent the emission of potentially harmful substances.

Our waste management is based on the systematic tracking of our material flows and follows a clear hierarchy: We aim to avoid waste as far as possible, for example, by continuously optimizing our processes or developing new production methods. BASF's Verbund structure with its networked plants and value chains is key here: The by-products of one plant serve as feedstock elsewhere in the BASF Verbund, avoiding waste and enabling us to use raw materials as efficiently as possible.

If these cannot be used within BASF's Verbund structures, we assess whether they can be recycled or thermally recovered. We have established processes for the safe, proper and environmentally responsible disposal of materials that we cannot recycle or where recycling is not legally permitted. If we use external waste disposal companies, we conduct regular audits to verify that waste is disposed of properly. In this way, we also contribute to preventive

soil protection and keep today's waste from becoming tomorrow's contamination. If soil and groundwater contamination occurs at active, acquired or former sites, we review and implement appropriate remediation measures.

We are committed to reducing the impact on air and soil and minimizing disposal volumes and material consumption along our value chains. We expect suppliers to comply with internationally recognized environmental standards. This is assessed as part of our supplier management. We support our suppliers in developing and implementing measures for improvement, for example in waste management (see page 116). We offer our customers a wide range of products that can reduce air pollutants or waste – from industrial process catalysts, fuel additives and catalysts for the automotive sector to additives and track-and-trace technologies to extend the useful life of plastics or improve mechanical recycling of plastic waste.

We are increasingly aligning our actions with the **circular economy principle**. For example, we are increasingly using recycled and waste-based raw materials in our production, recycling operating supplies, and expanding our capacities for recovering precious metals from spent automotive and industrial catalysts. We are also developing product-specific recycling technologies and are involved in cross-industry networks and initiatives to avoid plastic waste (see page 51) and strengthen the circular economy.

 For more information on the circular economy, see page 43

Emissions to air

Total emissions of air pollutants from our production plants amounted to 23,360 metric tons in 2022 (2021: 25,869 metric tons¹). Emissions of ozone-depleting substances as defined by the Montreal Protocol totaled 14 metric tons in 2022 (2021: 18 metric tons¹). Emissions of heavy metals² in 2022 amounted to 4 metric tons (2021: 2 metric tons).

¹ The comparative figure for 2021 has been adjusted to reflect updated data.

² Heavy metals are included in the figure for dust (see the table "Emissions to air").

Emissions to air			
Metric tons		2022	2021
Air pollutants from BASF operations			
CO (carbon monoxide)	3,833	3,951	
NO _x (total nitrogen oxides)	9,326	11,088 ^a	
NMVOC (nonmethane volatile organic compounds)	4,621	4,817 ^a	
SO _x (total sulfur oxides)	1,553	1,908 ^a	
Dust	2,060	2,154	
NH ₃ (ammonia) and other inorganic substances	1,965	1,951	
Total	23,360	25,869^a	

^a The comparative figure for 2021 has been adjusted to reflect updated data.

We want to further reduce emissions with various measures. For instance, we use catalysts to reduce nitrogen oxides or feed waste gases back into the production process.

Waste

BASF generated 2.21 million metric tons of waste in 2022 (2021: 2.41 million metric tons¹). Of this, 52.6% was disposed of (2021: 52.4%). Hazardous waste accounted for 75.2% of the total disposed waste (2021: 76.9%). Based on the concept of the circular economy, we are continuously examining options for material or thermal recycling for all waste (see "Strategy"). In this way, we were able to find new uses for 47.4% of our waste in 2022 (2021: 47.6%). We continuously identify and evaluate the safest and most environmentally sound disposal routes for non-recyclable waste. In 2022, most of our hazardous waste was incinerated (75.1%), where possible with energy recovery. 8.0% of hazardous waste was disposed of in landfill. This was mainly contaminated construction waste that cannot be recycled due to legal requirements.

Waste generation in the BASF Group	Million metric tons			
	Hazardous waste ^a	Nonhazardous waste ^a	2022	2021
Recycled	0.14	0.14	0.31	0.37
Thermally recovered	0.49	0.52	0.11	0.12 ^c
Waste recovered	0.63	0.66	0.42	0.49^c
Through incineration (without energy recovery)	0.64	0.73 ^c	0.05	0.06 ^c
In surface landfills	0.12	0.12	0.22	0.21 ^c
Other ^b	0.12	0.12 ^c	0.02	0.02
Waste disposed of	0.87	0.97	0.29	0.29^c
Total waste generation	1.50	1.63	0.71	0.78^c

^a Waste is classified as hazardous or nonhazardous waste according to local regulations.

^b Physical/chemical and biological treatment, underground disposal

^c The comparative figure for 2021 has been adjusted to reflect updated data.

Contaminated sites

We have binding global standards for managing contaminated sites. A worldwide network of experts ensures these are implemented. We develop remediation measures designed to balance nature conservation, climate protection concerns, costs and social responsibility. These solutions take into account the legal framework and current technological standards. Contaminated sites are documented in a database. Ongoing remediation work around the world continued on schedule in 2022 and planning was concluded for further measures.¹

 For more information, see Notes 9 and 23 on pages 230 and 266



The BASF wastewater treatment plant at the Ludwigshafen site in Germany is one of the largest in Europe. Around 86 million cubic meters of production wastewater are treated here every year, plus around 18 million cubic meters of wastewater from surrounding communities. In recent years, we have continuously increased the energy efficiency and effectiveness of the plant.

Material topics in focus:

Water

GRI 3, 303, 304



Water is of fundamental importance in chemical production. It is used as a coolant, solvent and cleaning agent, and to make our products. Waterways are used to transport goods. At the same time, water is a scarce commodity in an increasing number of regions. That is why we promote the responsible use of this resource with sustainable water management.

At a glance

1,590 million
cubic meters total water abstraction

79%
of water demand covered by reuse

- Responsible use is a core part of our strategy
- Sustainable water management introduced at 61.6% of relevant sites
- Top rating of "A" in the annual CDP assessment

Strategy and governance

The responsible use of water as a resource is a core element of our Responsible Care Management System and our risk management, as well as an important part of our commitment to the United Nations' Sustainable Development Goals (SDGs). This is also reflected in our **position paper on water protection**, which we published in 2021.

Our global standards and requirements for water are defined in Group-wide guidelines. Among other things, these stipulate that water protection concepts must be implemented at all production

sites. The guidelines also cover aspects such as process and transportation safety (see pages 126 and 134) in order to prevent production and transportation-related product spillages into water bodies as far as possible. Our sites and Group companies are responsible for implementing and complying with internal guidelines and legal requirements. The Environmental Protection, Health, Safety and Quality unit in the Corporate Center conducts regular audits to monitor this. BASF's global network of experts shares information, insights and best practices around the responsible use of water on an ongoing basis.

Introducing and implementing **sustainable water management** has been a cornerstone of our strategy for many years now. Our focus here is on our Verbund sites and on production sites in water stress areas.¹ The aim is to protect water as a resource, to use it as efficiently as possible through recirculation, and to continuously reduce wastewater and emissions. We consider the quantitative, qualitative and social aspects of water use.

We pursue our goal by applying the European Water Stewardship standard, which rests on four principles: sustainable water abstraction, maintaining good water quality, preserving conservation areas, and ensuring continuous improvement processes.

¹ We define water stress areas as regions in which more than 40% of available water is used by industry, households and agriculture. Our definition is based on the Water Risk Atlas (Aqueduct 3.0) published by the World Resources Institute. For more information, see wri.org/aqueduct.

We advocate the **responsible use of water as a resource** along the entire value chain. We audit supplier compliance with environmental standards in our regular supplier assessments (see page 114). Where improvement is necessary, we support suppliers in developing and implementing appropriate measures, such as the correct handling of wastewater. In addition, we are involved in a wide range of initiatives to promote sustainability in the supply chain. For example, efficient water use is a core part of the Pragati project to improve sustainability in castor bean farming (see page 119).

We offer our customers solutions that help purify water and use it more efficiently, and minimize pollution. These include high-performance plastics to produce ultrafiltration membranes, intermediates to produce flocculants for water treatment, or seeds with higher drought and heat tolerance.

We work with numerous partners along the value chain and from civil society to protect water as a resource. For instance, BASF is a member of the Alliance for Water Stewardship, a global multi-stakeholder organization that promotes the responsible use of water. In addition, we are involved in networks to effectively prevent plastic waste from entering water bodies (see page 51).

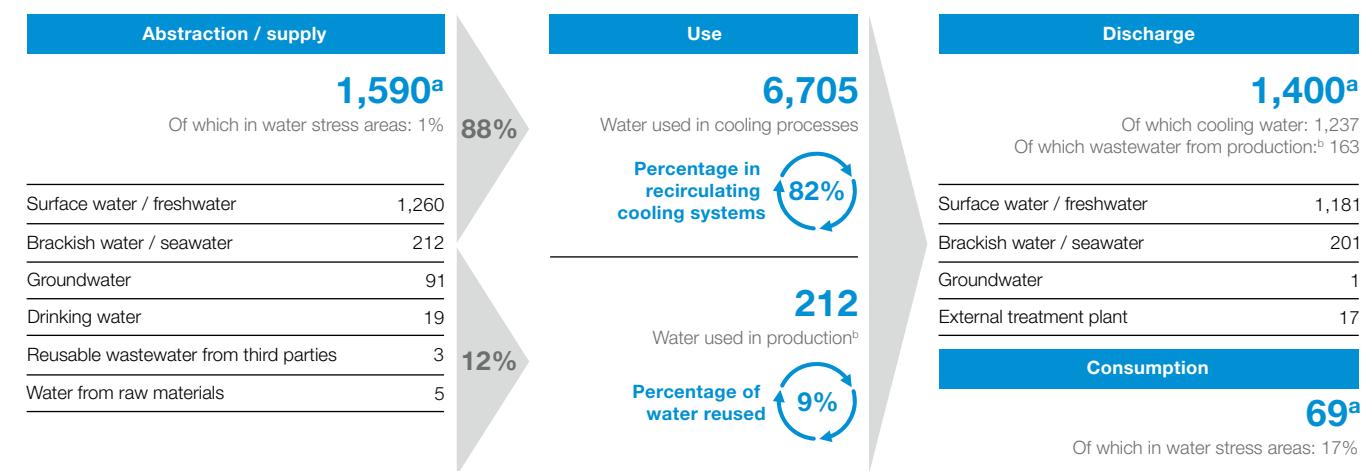
We report transparently and comprehensively on water. For instance, we again provided detailed answers to the 2022 water questionnaire from the nonprofit organization CDP. BASF again achieved Leadership status with a top rating of "A" in the final assessment. CDP evaluates how transparently companies report on their water management activities and how they reduce risks such as water scarcity. The assessment also considers the extent to which product developments can also contribute to sustainable water management at the customers of the evaluated companies.

 For more information on our position paper on water protection, see baf.com/water

For more information on the CDP water questionnaire, see baf.com/en/cdp

Water in the BASF Group 2022

Million cubic meters per year



^a The difference between water abstraction and discharge is due to water consumption and limited measurement accuracy in water discharge.

^b Sum of production processes, sanitary facilities, rinsing and cleaning in production

Global target and measures

Our goal is to introduce sustainable water management at our Verbund sites and at all production sites in water stress areas by 2030, covering 89% of BASF's total water abstraction. We achieved 61.6% of our target in 2022 (2021: 53.5%).¹ Sustainable water management was introduced at seven further sites in 2022 (2021: 7).

As part of sustainable water management, our sites regularly assess the water situation in the catchment area. This raises awareness of potential risks and impacts for the population such as water scarcity. Based on the assessments conducted until the end of 2022, we did not identify any activities with a significant impact on water availability and quality at any site.

2030 target

Introduction of sustainable water management at our production sites in water stress areas and at our Verbund sites

Another important part of our sustainable water management is the continuous analysis and **implementation of measures for improvement**. For example, changes in the production process (transesterification process) at the Caojing site in China reduce the need for feedstocks, steam and water. This can save 25% of the wastewater from this process step each year. At the Camaçari site in Brazil, an improvement in the recirculation of cooling water and the reuse of condensate saves around 49,000 cubic meters of water every year. The team received the Bahia Sustainable Industries Award for its successful water management. Depending on the

¹ Our water target also continues to take into account the sites that we identified as water stress sites in accordance with Pfister et al. (2009) prior to 2019.

local situation, we also implement measures together with other stakeholders. One example is the Lake Winnipeg Basin Water Stewardship Project in the Canadian province of Manitoba, which was launched in 2022.

Water balance

Our **water abstraction** totaled 1,590 million cubic meters in 2022 (2021: 1,695). This demand was covered for the most part by freshwater such as rivers and lakes (86% of water abstraction). At some sites, we use alternative sources such as treated municipal wastewater, brackish water or seawater. A small part of the water we use reaches our sites as part of raw materials and steam, or is released in our production processes. We abstract most of the water we need for cooling and production ourselves. In 2022, 5% of our total water demand was covered by third parties (2021: 5%).

Water use in 2022 totaled 6,917 million cubic meters (2021: 7,110 million cubic meters). Put in relation to total water abstraction, this means that we use every liter we abstract around four times, or cover 79% of our water demand with reuse. We predominantly use water for cooling purposes (88% of water abstraction), after which we discharge it back to our supply sources with no product contact. We reduce our water abstraction for cooling purposes mainly by using recooling plants. Around 12% of our total water abstraction is used in production plants, for example, for extraction or dissolution processes or for cleaning. Here, too, we reduce our demand for water by recycling wastewater. Most of the water used for production purposes is discharged back to water bodies after being treated in our own or third-party wastewater treatment plants.

The BASF Group's **water consumption** describes the amount of water that is not discharged to a water body, meaning that it is no longer available to other users. Consumption is mainly attributable to the evaporation of water in recirculating cooling systems. A smaller amount is from the water contained in our products. Water

consumption in 2022 amounted to around 69 million cubic meters (2021: 72 million cubic meters).

In 2022, around 25% of our production sites were located in water stress areas (2021: 25%). These sites accounted for 1% of BASF's total water abstraction (2021: 1%).¹ In water stress areas, we mainly source water from third parties (81%) and largely cover our demand with freshwater. Water consumption in water stress areas accounted for 17% of BASF's total water consumption in 2022 (2021: 16%) and was primarily attributable to evaporation in cooling processes. Wastewater in water stress areas accounted for less than 1% of BASF's total wastewater. The share of wastewater from cooling processes in water stress areas is lower than for the BASF Group as a whole. Cooling water is rarely used for once-through cooling here. Instead, it is generally recirculated to reduce water demand. Production wastewater in water stress areas is primarily treated at third-party facilities.

The supply, treatment, transportation and recooling of water is associated with a high energy demand. We are constantly working to optimize our energy consumption and the amount of water we use, and to adapt to the needs of our business and the environment.

Emissions to water

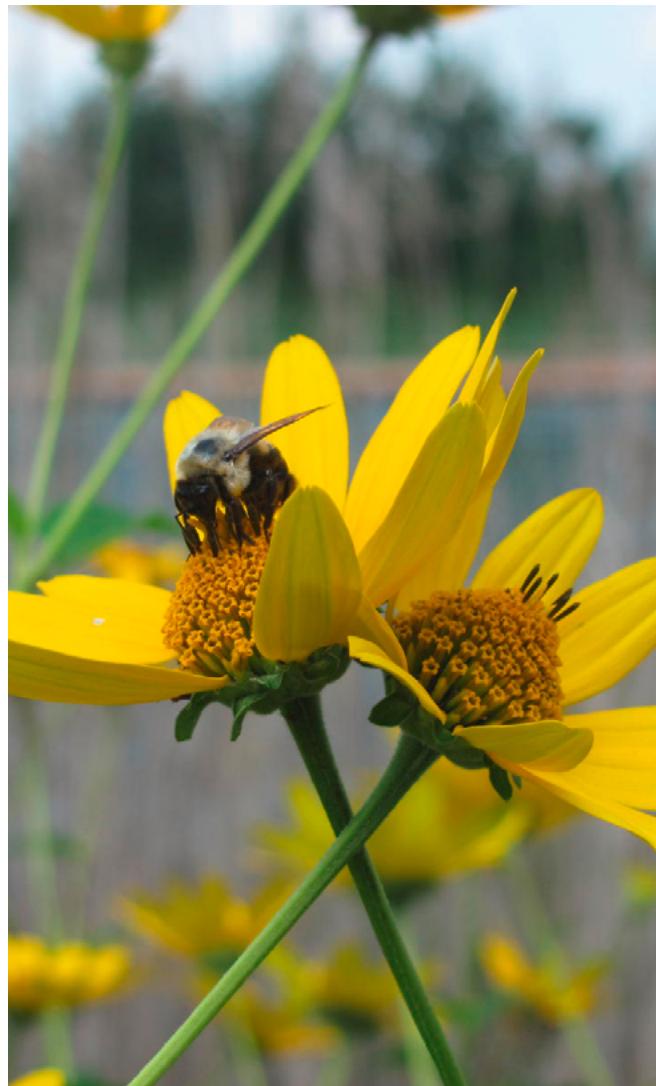
Our wastewater is subject to strict controls and we carefully assess the impact of wastewater discharge in accordance with the applicable laws and regulations. Both internal audits and the responsible local authorities regularly assess whether the analyses and safety precautions at our sites comply with internal guidelines and legal requirements. A total of 1,400 million cubic meters of water were discharged from BASF production sites in 2022 (2021: 1,503), including 163 million cubic meters of wastewater from production. Emissions of nitrogen to water amounted to 2,600 metric tons in 2022 (2021: 3,000). Around 10,600 metric tons of organic substances were emitted in wastewater (2021: 12,500). Our wastewater

contained 16 metric tons of heavy metals (2021: 17). Phosphorus emissions amounted to 240 metric tons (2021: 340).

Our approach is to reduce wastewater volumes and contaminant loads at the source in our production processes and to reuse wastewater and material flows internally as far as possible. To treat wastewater, we use both central measures in wastewater treatment plants and the selective pretreatment of individual wastewater streams before these are sent to the wastewater treatment plant. We use different methods depending on the type and degree of contamination – including biological processes, chemical oxidation, membrane technologies, precipitation or adsorption. In order to avoid unanticipated emissions and the pollution of surface water or groundwater, we have water protection concepts for our production plants in place. This is mandatory for all production plants as part of our Responsible Care Management System (see page 123). The wastewater protection plans involve evaluating wastewater in terms of risk and drawing up suitable monitoring approaches. We use audits to check that these measures are being implemented and complied with.]

For more information, see basf.com/water

¹ Aqueduct 3.0 was used to identify sites in water stress areas to determine pro rata water abstraction and water consumption.



BASF is committed to preserving biodiversity at different sites. At the former Rensselaer manufacturing site in upstate New York, for example, a biodiversity project is improving ecological conditions and providing space for indigenous plants such as the oxeye sunflower, as well as foraging and nesting areas for a variety of animals.

Material topics in focus:

Biodiversity

GRI 3,304



Biodiversity describes the variety of life forms on Earth. The loss of this diversity weakens ecosystems' ability to withstand changes such as climate change and poses a global challenge. As a chemical company, we depend on ecosystem services like the availability of renewable resources and high air, water and soil quality, while also influencing them. Protecting biodiversity is a key element of our commitment to sustainability.

At a glance

- Strategic alignment of our biodiversity measures based on impact assessments
- Commitment to preserving biodiversity along the entire value chain, for example, with strategic partnerships

Strategy

Our specific measures along the entire value chain help to preserve biodiversity and meet our responsibility to the environment and society. Our corporate sustainability goals on climate protection, the circular economy, water management and responsible procurement also help to protect biodiversity. The United Nations' Convention on Biological Diversity and the Sustainable Development Goals (SDGs) – including Life below water (SDG 14) and Life on land (SDG 15) – serve as important orientation and reference frameworks for BASF.

We align our biodiversity measures with the impact of our business activities along the value chain. Our focus here is on three areas: sites and production, product impact and supply chains. The five drivers of biodiversity loss defined by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services are land-use change, climate change, pollution, overexploitation and

invasive species. We counteract climate change – and in this way, help to preserve biodiversity – with our climate protection measures (see page 135). We are committed to combating habitat loss, over-exploitation and environmental pollution with activities along various value chains, including palm and palm kernel oil.

To be able to take the right measures, we need to understand how our actions affect the biodiversity of the affected ecosystems. Measuring biodiversity is a challenge, as a global indicator – like greenhouse gas emissions for climate change – does not yet exist. This is because the local context also has to be taken into account when assessing impact.

We use various methods to measure our **sustainability performance** that implicitly and explicitly consider relevant risks and opportunities for biodiversity. These include the Eco-Efficiency Analysis, SEEbalance®, Sustainable Solution Steering as well as AgBalance® with its biodiversity calculator. We use indicators such as nitrogen emissions to water to measure drivers of biodiversity loss, and indicators such as species occurrence to assess the status of ecosystems. In addition, we regularly test various analysis tools available on the market. Newly developed assessment methods help us to understand further influences on biodiversity. On the basis of this understanding, we seek dialog with partners and enter into strategic partnerships, through which we drive forward measures to protect biodiversity around the world.

An internal working group addresses company-wide governance and the systematic identification of risks and opportunities arising from biodiversity.

Responsibility to our sites and production

Preservation of biodiversity is taken into consideration in the management of our sites. We strive to operate our facilities in a responsible manner and minimize negative effects on the environment (**driver of biodiversity loss: pollution**) by keeping air, water and soil emissions as low as possible and reducing and avoiding waste (see page 142 for more information).

Conservation areas play a valuable role in preserving biodiversity and natural habitats. In 2021, we added an indicator to our environmental database: proximity of production site to internationally recognized protected areas. We use databases such as the Integrated Biodiversity Assessment Tool (IBAT) here. This allows us to raise awareness of biodiversity at local level and assess and, if necessary, reduce potential impacts of our sites on these areas. In 2022, 5% of our production sites were adjacent to a Ramsar site¹ and 1% were adjacent to a category I, II or III protected area as defined by the International Union for Conservation of Nature.² None of our production sites were adjacent to a UNESCO protected area.

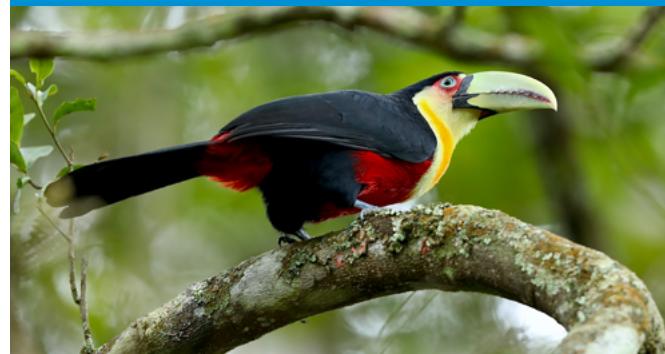
We have adopted biodiversity as a criterion in processes such as our risk management. In addition, we systematically consider sustainability aspects when deciding whether to invest in the construction of new sites or expand existing ones. Aspects assessed include the potential impacts on forests and biodiversity.

We are also implementing local measures to protect biodiversity at a number of sites. For example, at 13 sites in North America, biodiversity projects are regularly audited and certified by the NGO Wildlife Habitat Council (WHC). At the former Rensselaer production site in New York state, for example, BASF has been investing in

sustainable land use for over 10 years. The 90-hectare site on the Hudson River includes a LEED Platinum-certified environmental education classroom, a combined heat and power plant and a 10-hectare wildlife habitat. The wildlife habitat was created as part of the Hudson River legacy remediation and ecological restoration project, for which BASF received the Environmental Excellence Award for Environmental Dredging from Western Dredging Association in 2021. The biodiversity project improves site ecology, providing space for indigenous plants, foraging and nesting areas for a variety of animals, a way-station for migratory birds, and a habitat for aquatic species, amphibians and reptiles. For example, the aquatic turtle population in the freshwater wetland area could be restored.

We also take biodiversity conservation into account in our production. In addition, we are committed to complying with the provisions of international environmental agreements such as the Nagoya Protocol. The supplementary agreement to the U.N.'s Convention on Biological Diversity regulates access to genetic resources and benefit sharing. It sets out obligations (for example, compensation payments) for the users of genetic resources such as plant-based raw materials. We use internal control mechanisms to monitor compliance with these standards.

Good to know



Biodiversity reserve in Brazil

BASF has been involved in the conservation and regeneration of the forests of the Atlantic Rainforest for more than 30 years. An eight-month biodiversity survey in collaboration with the Brazilian Espaço ECO Foundation found a diversity of more than 200 animal and plant species in the 30-hectare Suviril Reserve on the Brazilian paints and coatings industrial complex in São Bernardo do Campo (São Paulo state). This section of the Atlantic Rainforest, which accounts for almost half of the total area of the BASF site, shows how industry and the environment, productivity and sustainability can coexist. The Suviril reserve is part of the Brazilian BASF Demarchi + Ecoefficient program, which achieves more efficient use of natural resources and improves products and processes.

¹ Wetland of international importance in accordance with the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)

² We have defined "adjacent" as the area within a 3 km radius.

Management of our product impact

BASF offers products and solutions for a wide range of industries. We want to ensure that our products meet our customers' standards in quality and, through appropriate use, pose no risk to humans, animals or the environment. Our commitment to the objectives set forth by the Responsible Care® charter of the International Council of Chemical Associations (ICCA) obligates us to continuously minimize the negative effects of our products on the environment, health and safety and to optimize our products on an ongoing basis. It is important to consider the potential impacts of product use on biodiversity, for example, with regard to pollution.

For example, we evaluate our products and solutions in crop protection and seeds throughout the entire research, development and registration process. After they have been approved for the market, we continue assessing them regularly for potential risks and impact to the ecosystems in which they are used. We have initiated various projects and offer training to prevent misuse of our products (see page 132).

All types of land development, such as agriculture and forestry, play a role in changing biodiversity (**driver of biodiversity loss: land-use change**). Activities such as tillage, drainage, fertilization and the use of crop protection products can affect flora and fauna, for example, by influencing food sources. Minimizing these impacts while ensuring the necessary productivity is one of the biggest challenges farmers are facing.

Our Agricultural Solutions segment focuses on four areas to help farmers to find the right balance between productivity and sustainability. Focus areas are climate-smart farming, sustainable solutions, digital farming and smart stewardship (see box on page 34). In this context, we work with farmers to create balanced agricultural systems which enable productive and efficient farming of high-quality food products and at the same time promote biodiversity in the field. For example, we advise them on soil cultivation practices and look for suitable ways to improve biodiversity in farmlands. Our many years of experience in sustainability measurement

and evaluation in agriculture are particularly useful here. Our modern seed solutions also enable better yield on existing farmlands and thus help protect natural habitats.

Our AgBalance® method and the biodiversity calculator enable a scientifically sound assessment of the impact of agricultural practices on biodiversity. Based on these assessments, we issue recommendations for measures such as planting flower strips or establishing nesting places to benefit pollinators like wild bees and farmland birds.

In 2021, BASF initiated the approval process for a new, more environmentally friendly insecticidal active ingredient and has since submitted registration dossiers in all major markets. The active ingredient, Axalon™, enables farmers to control a wide range of piercing and sucking pests that are harmful to crops. At the same time, it is highly compatible with beneficial insects such as pollinators. This supports farmers in managing the challenges they face around productivity, protecting the environment and societal demands.

Animal farming is essential to meeting growing global demand for products of animal origin such as meat, eggs and milk. This in turn leads to high demand for agricultural land for growing feed, which has implications for the share of forest areas and biodiversity. BASF offers a range of feed additives such as enzymes, vitamins, glycines and organic acids that improve nutrient utilization from feed. Better feed conversion and more sustainable livestock production mean that less land is needed, preserving natural ecosystems.

Responsibility to our supply chains

Some of the business activities of our raw materials suppliers involve land uses that can influence biodiversity (**driver of biodiversity loss: land-use change**). We have laid down our expectations of our suppliers with regard to environmental, labor and social standards in the supply chain as well as our commitment to preserving biodiversity in the Supplier Code of Conduct (see page 115).

BASF procures various renewable raw materials. As for fossil raw materials, we also consider how renewable resources impact aspects of sustainability along the value chain. Alongside positive effects like avoiding greenhouse gas emissions, these can also have negative effects on areas such as biodiversity or land use, depending on the raw material.

For palm and palm kernel oil in particular, there is an elevated risk of deforestation to create farmland. To improve sustainability in procurement, we established the BASF Palm Commitment in 2011, which was updated in 2015 and is implemented with our Palm Sourcing Policy. Third-party certification with standards such as the Roundtable on Sustainable Palm Oil (RSPO) standard enables us to take biodiversity criteria into account when purchasing raw materials (see page 118).

Our **position on forest protection** sets out our commitment to preserving biodiversity in areas of High Conservation Value such as High Carbon Stock forest areas and peatlands in the procurement of renewable raw materials. BASF again participated in the "Forests" assessment conducted by the international organization CDP in 2022 and achieved a score of A-, once more giving it Leadership status. The assessment is conducted based on detailed insights into the palm value chain and activities that impact ecosystems and natural habitats.

We are also committed to the environmental sustainability of other supply chains through our own, targeted initiatives. One example is our rambutan program. This was launched in 2014 in close collaboration with partners in Vietnam to source botanical ingredients for cosmetic products from certified organic rambutan gardens. In cooperation with local farmers and NGOs, BASF's program promotes the preservation of biodiverse habitats, as well as good agricultural practices, gender equity and fair working conditions.

 For more information on the CDP forests questionnaire, see bASF.com/en/cdp

Strategic partnerships to promote biodiversity

Engaging in ongoing dialog with a variety of stakeholders is important to BASF. That is why we seek out partnerships with relevant interest groups and organizations worldwide to raise awareness of biodiversity and drive forward the action needed to preserve natural habitats. This enables us to firstly share the knowledge gained from our biodiversity activities and secondly learn from others to improve our own practices.

We cooperate with a number of organizations including the Roundtable on Sustainable Palm Oil, the Sustainable Palm Oil Forum, the Brazilian Coalition on Climate, Forests and Agriculture and the High Carbon Stock Approach Steering Group. The Taskforce on Nature-related Financial Disclosures (TNFD) is working to provide a framework for reporting on nature-related risks and related activities. In 2021, BASF joined the newly established TNFD Forum, a consultative network, to support this development. Our involvement in organizations such as the Alliance to End Plastic Waste and the Alliance for Water Stewardship (see page 144) help to preserve biodiversity in bodies of water.

Together with international partners and based on dialog with stakeholders in the food value chain, we are driving forward measures to promote sustainable agriculture. In the United States, for example, BASF is a member of the Honey Bee Health Coalition, which aims to achieve healthy honey bee populations and support healthy populations of native and managed pollinators in productive agricultural systems and thriving ecosystems. BASF France is part of the Entreprises pour l'Environnement (EpE) network, which launched the Act4nature campaign with the main objective of protecting and enhancing biodiversity.

Since 2013, we have also been working with different farmers and experts from the BASF FarmNetwork Sustainability, an association of farms in Europe, to integrate more connected biodiversity areas into agricultural production. By creating and maintaining new habitats and linking habitats for living, breeding and feeding with each other, biodiversity can be sustainably promoted in a modern,

conventional agriculture. Based on the insights gained from working together, an advisory board of experts from agriculture, nature conservation and environmental protection developed a biodiversity checklist and published it in 2021. This summarizes 10 ecologically effective measures to promote biodiversity. Since 2021, BASF has supported farmers participating in its #wirzahlenBiodiversität (“We pay biodiversity”) program financially and with professional advice. [\[1\]](#)

 For more information on our responsible management of resources, see page [43](#)

 For more information on product stewardship, see pages [130](#) and [132](#)

 For more information on our commitment to biodiversity, see [basf.com/biodiversity](#)

 For more information on our position on forest protection, see [basf.com/forestprotection](#)

Forecast

We expect the global economy to grow only weakly by 1.6% in 2023 (2022: +3.0%). High raw materials costs, rising consumer prices and higher interest rates will depress demand worldwide. We are also assuming that the positive post-pandemic effects have already run their course. We expect growth of only 1.8% for global industrial production (2022: +2.5%) and 2.0% for global chemical production (2022: +2.2%). Uncertainty about future developments remains high.

In this section:
Economic Environment in 2023
Outlook 2023
Opportunities and Risks

Economic Environment in 2023¹

At a glance

- Stagnation expected in Europe and the United States
- Moderately higher growth in Asia
- Fragile recovery in the automotive industry
- Moderate growth in the industry as a whole
- Weak growth in global chemical production
- Further decline in European chemical production

In the European Union, gross domestic product is expected to stagnate on the back of high energy costs. High regional natural gas prices will continue to weigh heavily on production in energy-intensive industries. Consequently, we anticipate a significant decrease in chemical production in the E.U. at a similar rate to 2022. In North America, too, we expect gross domestic product to stagnate and chemical production to decline slightly. For China, we are forecasting slightly higher GDP growth compared with the previous year, while growth in other emerging Asian economies will probably weaken. Growth in chemical production in the Asian region as a whole is likely to remain stable overall.

Uncertainty about future developments remains exceptionally high. The future development of the war in Ukraine and its impact on economic growth is virtually impossible to predict. Our forecast assumes that the conflict does not escalate further. We are assuming that an acute gas shortage with regulatory cuts in natural gas supply to energy-intensive industries in Europe can be avoided. Moreover, we do not expect China's departure from its zero-COVID strategy to have any adverse effects that would significantly reduce China's growth or that of its trading partners.

Trends in the global economy in 2023

We expect GDP to stagnate in the **European Union (E.U.)** (2023: +0.1%, 2022: +3.6%). The support measures taken by many E.U. countries to mitigate the impact of the sharp rise in gas and electricity prices on households and small and medium-sized enterprises will help to prevent a stronger decline. The E.U. countries with a comparatively high industrial share of value added and a high share of natural gas in energy supply are likely to suffer further losses. As a result, we expect gross domestic product to decrease by 0.7% in Germany and by 0.4% in Italy. French GDP will presumably stagnate. The only major E.U. country expected to see slight

growth is Spain (+1.0%). Average GDP in the Eastern E.U. countries will probably stagnate (+0.3%).

In the **United Kingdom**, we expect GDP to decline by 1.2% (2022: +4.1%) due to sharp increases in the cost of living and interest rates, which will depress private consumption and investment.

GDP in the **United States** is expected to stagnate in 2023. U.S. monetary policy is steering a restrictive course in order to further reduce the high inflation rate, which is already declining slightly. High interest rates are slowing construction activity, credit-financed purchases of durable goods and capital expenditures. Offsetting factors include good labor market data and government growth stimulus under the infrastructure program and the Inflation Reduction Act. Low gas prices by international standards will also improve the international competitiveness of energy-intensive industries in the United States.

In the **emerging markets of Asia**, we expect growth to be slightly higher overall (+4.4%) than in 2022 (+3.8%). This is solely due to higher expected growth in **China** (+4.5% in 2023 compared with +3.0% in 2022). For the other emerging markets in Asia, we expect growth to decline overall from 5.5% in 2022 to 4.3% in 2023. In

¹ Our assumptions account for current estimates by external institutions, including economic research institutes, banks, multinational organizations and consulting firms.

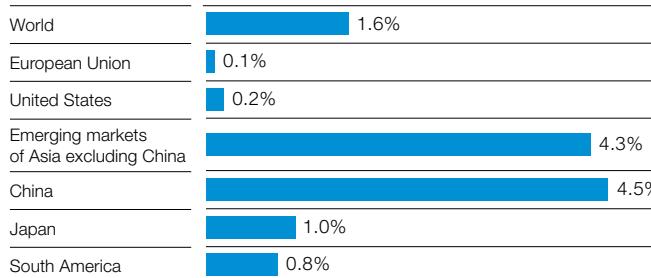
India, growth is expected to slow to 5.2% (2022: +7.0%). Western trading partners' weak performance will negatively impact the emerging Asian economies. At the same time, their currencies have depreciated significantly against the U.S. dollar in the past year, making energy imports in particular more expensive. We assume that this will be countered by a recovery in domestic demand in China following the lifting of the zero-COVID strategy.

In **Japan**, growth is also expected to slow due to weaker export demand from Western trading partners and the weaker yen, which will make imports more expensive. Conversely, higher growth in China, reduced bottlenecks for semiconductors for the Japanese automotive industry and the continued accommodative course of Japanese monetary policy will support the Japanese economy. We therefore expect only a slight decline in growth overall (2023: +1.0%, 2022: +1.2%).

In **South America**, growth is expected to weaken significantly in 2023. Private consumption in Brazil will no longer be supported by fiscal measures as in the previous year. Given the generally weak global economy, export demand is not expected to provide any additional strong stimulus either. The Argentinian economy is suffering from very high and rising inflation rates. In addition, the scope for additional government spending is severely restricted by the debt restructuring program. The global economic slowdown will also put pressure on raw materials prices. South America is unlikely to benefit from significantly rising export prices for industrial and agricultural commodities in 2023. Overall, we expect GDP in the region to grow by 0.8% in 2023 (2022: +3.7%).

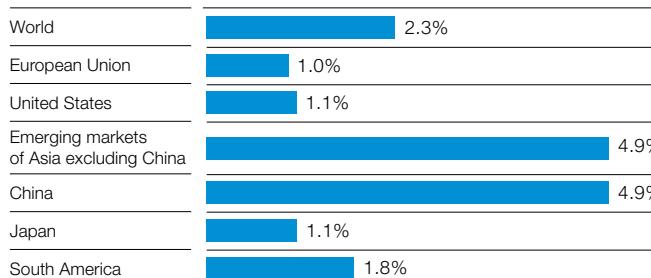
Outlook for gross domestic product 2023

Average annual real change compared with previous year



Trends in gross domestic product 2023–2025

Average annual real change



Outlook for key customer industries

Overall, we anticipate growth of 1.8% (2022: +2.5%) in global industrial production. Industrial production is expected to contract in the advanced economies (2023: -0.3%, 2022: +0.9%). Growth in the emerging markets will probably remain at a similar level to the previous year (2023: +3.5%, 2022: +3.8%).

For the **transportation industry**,¹ we are forecasting lower growth of 2.8% in 2023 compared with the previous year (+5.7%). Although supply bottlenecks in the automotive industry, especially

semiconductor shortages, are expected to ease further, demand for motor vehicles will cool due to declining purchasing power and rising interest rates. We expect global production volumes of passenger cars and light commercial vehicles to rise to around 84 million units in the coming year (2022: 82 million units). This means that the total number of vehicles produced is still almost 9% below pre-pandemic levels (around 92 million vehicles produced annually on average from 2015 to 2019). We expect the expansion of electromobility to progress rapidly and the share of total production volumes attributable to purely battery-electric vehicles to rise significantly from 10% in 2022 to almost 14% in 2023.

The catch-up effects in the European and North American automotive markets following the pandemic-related disruptions to supply chains are expected to slowly taper off. For both markets, we are assuming further but slower growth than in 2022. Following the significant increase in production in the previous year, we also anticipate weaker market growth in China. We also expect growth rates to decline overall in the other emerging markets of Asia. For Japan, on the other hand, we are forecasting a recovery in growth from a low baseline.

In the **energy and raw materials** sector, we expect lower growth in output overall due to the macroeconomic slowdown, mainly as a result of weaker growth in demand for oil and gas. Regional growth rates will vary considerably. Oil and gas production should continue to grow strongly in the United States but decline in Asia. In Europe, production will probably stagnate. By contrast, production of other non-agricultural commodities will grow at high, stable rates in Asia, stagnate in the United States and decline in Europe.

Growth in the **construction industry** is expected to continue to slow. Residential construction is likely to contract due to higher mortgage rates in Europe and the United States and the further cooling of the housing market in China. For other building construction, we expect weak growth roughly at the level of the previous year. By contrast, we are forecasting higher year-on-year growth for

¹ The transportation industry includes the production of motor vehicles, motor vehicle parts and the construction of other vehicles (especially ships and boats, trains, air and spacecraft, and two-wheelers).

the infrastructure segment, which should benefit from rising public spending in both the E.U. and the United States.

Consumer goods production is expected to grow only slightly faster than global GDP. The declining purchasing power of private households will have a particularly negative impact on demand for durable consumer goods, for example from the furniture industry. After production declined in 2022, we expect only slight growth for the textile industry, exclusively in the emerging markets. Growth in production of consumables, particularly in care products, will presumably weaken in line with GDP growth.

The **electronics industry** is also expected to grow at a slower pace in 2023 than in the previous year as private demand for PCs, personal communication devices and consumer electronics is dampened by high consumer price inflation, and many major purchases with long service lives were brought forward during coronavirus lockdowns. However, growth will be supported by the ongoing digitalization trend, meaning that growth rates should significantly outpace global GDP.

In the **health and nutrition** sector, we expect growth to be slightly higher and above GDP. The pharmaceutical industry is expected to return to slightly stronger growth after low growth in 2022 due to the vaccine boom in the previous year. Overall, food production will also increase at a slightly stronger rate than in the previous year but with wide regional differences. We expect lower growth for the advanced economies but slightly stronger year-on-year growth for the emerging markets due to the gradual recovery in China.

Agricultural production is expected to grow at a similar rate in 2023 to the average for recent years. Around 80% of growth will come from Asia, which is responsible for two-thirds of global agricultural production. Agricultural production in Asia and South America will outpace world production. For North America and Europe, we are only assuming slight growth.

Outlook for the chemical industry

Global chemical production (excluding pharmaceuticals) is expected to grow by 2.0% in 2023, slower than in the previous year (2022: +2.2%). We again anticipate a decline in production in the advanced economies (2023: -3.0%, 2022: -2.9%). Growth in the emerging markets is expected to slow slightly (2023: +4.4%, 2022: +4.8%).

In **China**, the world's largest chemical market, we are forecasting slightly weaker growth in chemical production of 5.9% (2022: +6.6%). We expect the opening of the Chinese economy to bring with it higher growth in Chinese domestic demand, especially in the consumer goods industries and the health and nutrition sector, as well as positive contributions to growth from the automotive and electronics industries.

Chemical production in the **E.U.** should again decrease by 5.2% (2022: -5.8%), well below the overall industrial development forecast for Europe. Due to the high energy costs, no major catch-up effects are expected in energy-intensive basic chemicals following the already strongly negative prior year. Growth should mainly be driven by demand from the automotive industry. By contrast, consumption of durable and non-durable consumer goods is not likely to increase. We also expect chemical production in the **United Kingdom** to continue to decline (2023: -5.5%, 2022: -5.0%).

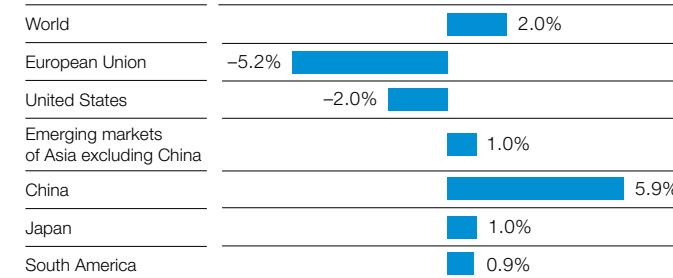
In the **United States**, the positive base effects that supported growth in 2022 will come to an end. Domestic demand will largely stagnate, with the exception of the automotive industry, the energy sector and the electronics industry. Demand from the construction industry is expected to decline on the back of high interest rates. Export demand for chemicals from Europe should provide positive momentum given the lower raw materials and energy prices. Overall, we expect a slight decline in chemical production (2023: -2.0%, 2022: +2.3%).

For **Japan**, we are forecasting a weak recovery after the decline in the previous year (2023: +1.0%, 2022: -3.0%). Growth stimulus here is expected to come primarily from the automotive sector.

South America will presumably see much lower growth in chemical production (2023: +0.9%, 2022: +2.6%). Demand from the consumer goods industries is expected to grow at a similarly weak rate to GDP. By contrast, we expect demand from the agricultural sector to increase more strongly and demand from the automotive industry to remain solid but with weaker growth than in the previous year.

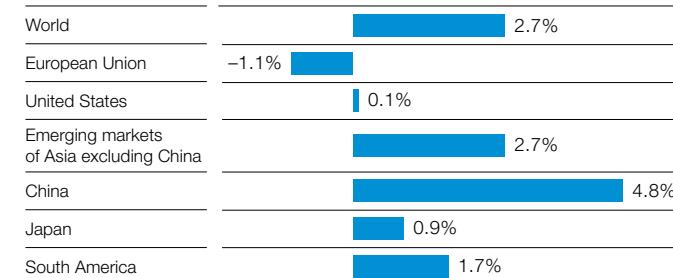
Outlook for chemical production 2023 (excluding pharmaceuticals)

Real change compared with previous year



Trends in chemical production 2023–2025 (excluding pharmaceuticals)

Average annual real change



Outlook 2023

The high level of uncertainty that arose over the course of 2022 due to the war in Ukraine, high raw materials and energy costs in Europe, rising prices and interest rates, inflation and the development of the coronavirus pandemic will continue in 2023. All of these factors will negatively impact global demand, which is why we only expect moderate growth for the global economy in 2023.

Outlook for 2023 at a glance

- Sales of between €84 billion and €87 billion
- EBIT before special items of between €4.8 billion and €5.4 billion
- ROCE of between 7.2% and 8.0%
- CO₂ emissions of between 18.1 million metric tons and 19.1 million metric tons
- Capex of around €6.3 billion

We anticipate moderate growth in the majority of our customer industries and expect the slight recovery in the automotive industry in particular to continue. Our forecast assumes that the war in Ukraine will continue but not escalate further, although the further development of the war in Ukraine and its effects on economic growth are still subject to a high degree of uncertainty. In addition, we are assuming that an acute gas shortage with regulatory cuts in natural gas supply to energy-intensive industries in Europe will not materialize. We expect China's departure from its zero-COVID strategy to have a positive impact on the development of demand.

The global economy is expected to grow by only 1.6% in 2023 (2022: 3.0%). We expect growth of 1.8% for global industrial production (2022: 2.5%), while global chemical production is likely to expand by 2.0% in 2023 (2022: 2.2%). Our planning assumes an average oil price of \$90 for a barrel of Brent crude and an exchange

rate of \$1.05 per euro. We anticipate elevated and very volatile gas prices in Europe.

 For more information on our expectations for the economic environment in 2023, see page 151 onward

For more information on the material opportunities and risks that could affect our forecast, see page 157 onward

Sales, earnings and ROCE forecast for the BASF Group¹

The BASF Group is expected to generate **sales** of between €84 billion and €87 billion in 2023. Planned volume growth in all segments will contribute here. We anticipate slight sales growth in the Agricultural Solutions and Materials segments, mainly driven by higher prices and volumes in both segments. Sales in Other should be slightly higher. We are forecasting sales at prior-year level in the Nutrition & Care segment. We anticipate lower price levels, especially for basic chemicals and precious metals, which will lead to a slight sales decrease in the Chemicals and Surface Technologies segments. The Industrial Solutions segment is also expected to see slightly lower sales due to the sale of the kaolin minerals business.

The BASF Group's **EBIT before special items** is expected to decline to between €4.8 billion and €5.4 billion. Our planning for the Agricultural Solutions segment assumes a slight increase in EBIT before special items. In the Nutrition & Care, Surface Technologies and Industrial Solutions segments, we expect slightly lower EBIT before special items. We anticipate significantly lower contributions from the Chemicals and Materials segments and from Other. We expect a weak first half of 2023 followed by an improved earnings

environment in the second half of the year due to recovery effects, especially in China.

Based on the weaker earnings performance and slightly higher cost of capital basis forecast for the BASF Group in 2023, we expect a **ROCE** of between 7.2% and 8.0%. ROCE should increase slightly in the Agricultural Solutions segment. In the Industrial Solutions and Surface Technologies segments, ROCE is likely to decline slightly. Compared with the previous year, we anticipate a considerable decrease in ROCE in the Chemicals, Materials and Nutrition & Care segments.

CO₂ emissions forecast for the BASF Group

CO₂ emissions are expected to be between 18.1 million metric tons and 19.1 million metric tons in 2023. We anticipate additional emissions from moderate growth in production and slightly higher capacity utilization at emissions-intensive plants. For example, the ammonia plants in Europe will probably see higher capacity utilization compared with 2022 but will continue to run at low levels due to sustained high gas prices. We will counteract this increase with targeted measures to reduce emissions, further increase energy efficiency and optimize processes and, above all, continue the shift to electricity from renewable energies.

¹ For sales, "slight" represents a change of 0.1%–5.0%, while "considerable" applies to changes of 5.1% and higher. "At prior-year level" indicates no change (+/-0.0%). For earnings, "slight" means a change of 0.1%–10.0%, while "considerable" is used for changes of 10.1% and higher. "At prior-year level" indicates no change (+/-0.0%). For ROCE, we define a change of 0.1 to 1.0 percentage points as "slight," a change of more than 1.0 percentage points as "considerable" and no change (+/-0.0 percentage points) as "at prior-year level."

Forecast by segment

Million €

	Sales		EBIT before special items		ROCE	
	2022	2023 forecast	2022	2023 forecast	2022	2023 forecast
Chemicals	14,895	↗	1,956	↘	15.6%	↘
Materials	18,443	↗	1,840	↘	14.9%	↘
Industrial Solutions	9,992	↘	1,091	↗	16.0%	↗
Surface Technologies	21,283	↘	902	↘	3.9%	↘
Nutrition & Care	8,066	↗	618	↗	7.5%	↘
Agricultural Solutions	10,280	↗	1,220	↗	7.1%	↗
Other	4,368	↗	-749	↘	-	-
BASF Group	87,327	€84 billion–€87 billion	6,878	€4.8 billion–€5.4 billion	10.0%	7.2%–8.0%

↗ At prior-year level: no change (+/-0.0%)

↗↘ Slight increase/decrease: "slight" represents a change of 0.1%–5.0% for sales; 0.1%–10.0% for earnings; 0.1 to 1.0 percentage points for ROCE

↑↘ Considerable increase/decrease: "considerable" represents a change of 5.1% or higher for sales; 10.1% or higher for earnings; more than 1.0 percentage points for ROCE

Sales and earnings forecast for the segments

Sales in the **Chemicals** segment are expected to decrease slightly in 2023 due to lower prices in both operating divisions. This will be driven by pressure on prices caused by higher product availability overall as new production capacities come on stream and supply chain problems ease. An expected recovery in demand, especially in China, will lead to volume growth in the segment. This will presumably not be able to fully compensate for the negative price effects. The lower prices will also put pressure on margins. Consequently, we are forecasting a considerable decline in EBIT before special items in both operating divisions. In addition, earnings performance will be negatively impacted by significantly higher fixed costs, mainly from investments in the construction of the new Verbund site in Zhanjiang, China, and in the expansion of the ethylene oxide plant in Antwerp, Belgium.

We are forecasting slight sales growth for the **Materials** segment. Given the continued volatile market environment, we anticipate higher prices driven by raw materials costs in the Monomers division. Slight volume growth overall will contribute to the sales increase. However, we are seeing diverging trends within the segment: The Performance Materials division will presumably record volume growth in all customer industries. By contrast, we anticipate slightly lower sales volumes in the Monomers division. We are forecasting a considerable decrease in the segment's EBIT before special items due to earnings development in the Monomers division. The division's EBIT before special items is expected to decline considerably as a result of lower margins, after strong margins in 2022. In the Performance Materials division, by contrast, we anticipate considerable growth in EBIT before special items due to the positive development of sales volumes amid stable margins.

Our planning for the **Industrial Solutions** segment assumes slightly lower sales in both divisions in 2023. The volume growth targeted for the Performance Chemicals division will only partially offset the effect on sales of the divestiture of the kaolin minerals business as of September 30, 2022, and expected price declines due to lower demand. The slight sales decrease in the Dispersions & Resins division will mainly reflect lower volumes on the back of softer demand. We are forecasting a slight decline in the segment's EBIT before special items. This will primarily result from considerably lower EBIT before special items expected in the Dispersions & Resins division due to weaker margins. This will only be partially offset by considerable earnings growth in the Performance Chemicals division, mainly from higher volumes.

In the **Surface Technologies** segment, we are forecasting a slight sales decrease compared with 2022. This will primarily be driven by a significant decline in precious metal prices expected in the Catalysts division. Sales will be boosted by higher prices in the Coatings division and forecast volume growth in both divisions. The segment's EBIT before special items is expected to decline slightly. We expect considerably higher EBIT before special items in the Coatings division as a result of higher margins and volumes. In the Catalysts division, by contrast, we anticipate a considerable decrease due to weaker margins caused by high raw materials prices and lower precious metal prices.

We expect sales in the **Nutrition & Care** segment to be at prior-year level. Prices are expected to be lower overall as a result of declining raw materials prices. This will be compensated by volume growth in both operating divisions due to improved product availability and an easing of global supply chains. The segment's EBIT before special items should be slightly below the prior-year figure.

In the **Agricultural Solutions** segment, we expect slight sales growth in 2023. This will be mainly driven by higher prices while demand for agrochemicals and seeds will remain on a continuously high level. Based on the sales increase and a positive margin development, we are forecasting slightly higher EBIT before special items.

Sales in **Other** are expected to be slightly above the prior-year level in 2023. This should mainly result from higher sales from other activities, primarily driven by price increases. We anticipate a considerable decline in EBIT before special items compared with the previous year. This will largely reflect lower gains from hedging transactions, among other factors.

Capital expenditures (capex)

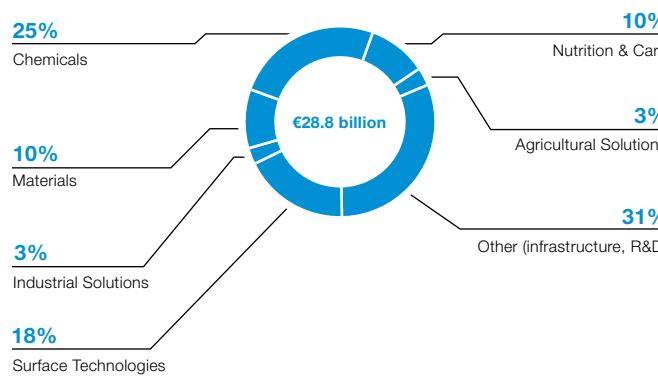
We are planning capital expenditures (additions to property, plant and equipment excluding acquisitions, IT investments, restoration obligations and right-of-use assets arising from leases) of around €6.3 billion for the BASF Group in 2023. For the period from 2023 to 2027, we have planned capital expenditures totaling €28.8 billion, including €13.6 billion for our major growth projects – the new Verbund site in Zhanjiang, China, and the expansion of the battery materials business. The investment volume in the next five years will thus be above that of the planning period 2022 to 2026 (€25.6 billion).

Projects currently being planned or underway include:

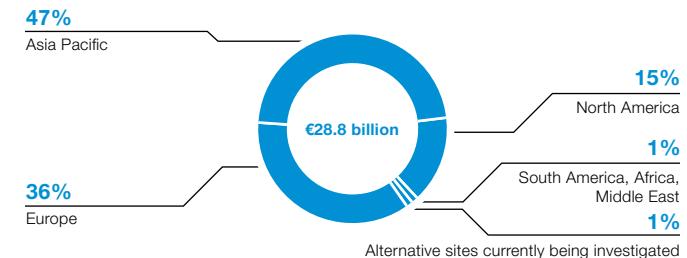
Capex: selected projects

Location	Project
Chalampé, France	Construction of a production plant for hexamethylenediamine
Geismar, Louisiana	Capacity expansion at MDI plant
Ludwigshafen, Germany	Modernization of chloroformates and acid chlorides production
Schwarzheide, Germany	Construction of a production plant for battery materials
Zhanjiang, China	Construction of a smart Verbund site

Capex by segment 2023–2027



Capex by region 2023–2027



Dividend

We have an ambitious dividend policy and offer our shareholders an attractive dividend yield. We aim to increase our per-share dividend each year.

Information on the proposed dividend can be found on page 13

Financing

In 2023, we expect cash outflows in the equivalent amount of around €2.1 billion from the scheduled repayment of bonds. To refinance maturing bonds and to optimize our maturity profile, we continue to have medium to long-term corporate bonds and our global commercial paper program at our disposal.

Information on our financing policies can be found on page 64 onward

Events after the reporting period

There have been no significant changes in the company's situation or market environment since the beginning of the 2023 business year.

Opportunities and Risks

GRI

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The goal of BASF's risk management is to identify and evaluate opportunities and risks as early as possible and to take appropriate measures in order to seize opportunities and limit risks. The aim is to avoid risks that pose a threat to BASF's continued existence and to make improved managerial decisions to create value. We define opportunities as potential successes that exceed our defined goals. We understand risk to be any event that can negatively impact the achievement of our short-term operational or long-term strategic goals.

At a glance

- Integrated process for opportunity and risk identification, assessment and reporting
- Decentralized management of specific opportunities and risks: aggregate reporting at Group level
- Material opportunities and risks for 2023 arise from overall economic developments and margin volatility

Where appropriate, we measure and manage opportunities and risks in terms of probability and economic impact in the event they occur. Where possible, we use statistical methods to aggregate opportunities and risks into risk factors. In addition, we use a qualitative evaluation scale for opportunities and risks to assess both business and sustainability aspects that cannot be quantified. In this way, we achieve an overall view of opportunities and risks allowing us to aggregate risks at Group level and take effective risk management measures.

Overall assessment

For 2023, we expect global economic growth to weaken as a result of high energy prices and inflation rates, rising interest rates and the phasing out of catch-up effects from the coronavirus pandemic. General economic uncertainty will remain exceptionally high.

A further escalation of geopolitical conflicts, for example in China, could lead to disruptions in global supply chains and greater

restrictions on the supply of energy, industrial raw materials and intermediates. The war in Ukraine poses significant risks for market development in Europe.

Weaker growth in China as a result of ongoing pandemic-related disruptions may give rise to risks for supply chains as well as the development of global demand.

In addition, there is considerable uncertainty surrounding consumers' reaction to the sharp rise in energy prices, inflation and the resulting loss of purchasing power. Opportunities will arise in particular from stronger growth in demand resulting from an improved overall economic environment.

Due to the exceptionally volatile markets, especially in Europe, the risks arising from European gas price developments and the availability of natural gas cannot currently be reliably estimated. The assumptions in our planning for 2023 are based on European gas prices that significantly exceed the 2019–2021 average. The overall assessment therefore does not include any additional opportunities or risks that could arise from the volatility of European gas prices.

The gas price brake in Germany and measures taken by other E.U. countries mean that these risks are partially mitigated by the state.

Furthermore, BASF will take internal measures, such as adjustments to production processes, if energy prices remain high. We are also responding to structurally higher energy costs with cost reduction measures.

We are continually monitoring the further development of natural gas prices. In the event of regulatory changes or changes in the market environment, we will adjust the overall assessment of opportunities and risks accordingly.

According to our assessment, there continue to be no significant individual risks that pose a threat to the continued existence of the BASF Group. The same applies to the sum of individual risks, even in the case of a global economic crisis.

Ultimately, however, residual risks (net risks) remain in all entrepreneurial activities that cannot be ruled out, even by comprehensive risk management.

As a non-integral shareholding, income from Wintershall Dea AG is reported in net income from shareholdings. The opportunities and risks resulting from the shareholding in Wintershall Dea are therefore not included in the outlook for the EBIT of the BASF Group. Opportunities and risks that have an impact on net income from shareholdings and cash flow from the shares in Wintershall Dea are monitored and tracked through BASF's involvement in the relevant governing bodies.

 For more information on the non-integral, equity-accounted shareholding in Wintershall Dea, see Note 10 to the Consolidated Financial Statements from page 231 onward

Potential short-term effects on EBIT of key opportunity and risk factors subsequent to measures taken^a

Possible variations related to:	Outlook – 2023 +
Business environment and sector	
Market growth	
Margins	
Competition	
Regulation/policy	
Company-specific opportunities and risks	
Procurement	
Supply chain	
Investments/production	
Acquisitions/divestitures/cooperations	
Personnel	
Information technology	
Compliance/legal	
Tax	
Financial	
Exchange rate volatility	
Other financial opportunities and risks	
 	< €100 million ≥ €100 million < €500 million ≥ €500 million < €1,000 million ≥ €1,000 million < €1,500 million ≥ €1,500 million < €2,000 million ≥ €2,000 million < €2,500 million

^a Using a 95% confidence interval per risk factor based on planned values; summation is not permissible.
Excludes European gas price volatility.

Risk management process

The BASF Group's risk management process is based on the international risk management standard, COSO II Enterprise Risk Management – Integrated Framework and comprises the risk management system, internal control systems and compliance management. Its key features are as follows:

Organization and responsibilities

- Risk management and the internal control system is the responsibility of the Board of Executive Directors. It defines the basic requirements and processes as well as the organization of the risk management system. It also determines the processes for approving investments, acquisitions and divestitures.
- The Board of Executive Directors is supported by the Corporate Center. Corporate Finance and Corporate Development, which are units within the Corporate Center, and the Chief Compliance Officer (CCO) coordinate the risk management process at a Group level, examine financial and sustainability-related opportunities and risks, and provide the structure and appropriate methodology. Opportunity and risk management is thus integrated into the strategy, planning and budgeting processes.
- BASF's risk committee reviews the BASF Group's risk portfolio at least twice a year to evaluate any adjustments to risk management measures and informs the Board of Executive Directors of these. Members of the risk committee are the president of Corporate Finance (chair), the president of Corporate Development, the president of Corporate Legal, Compliance & Insurance and the heads of the Corporate Audit, Corporate Environmental Protection, Health, Safety & Quality, Corporate Treasury, and Group Reporting & Performance Management departments.
- The management and control of specific opportunities and risks is largely delegated to the divisions, the service and research units and the regions, and is steered at a regional or local level. This also applies to sustainability-related topics relevant to BASF including the impact of climate change on BASF. A network of risk managers in the divisions, service and research units as well as in the regions advances the implementation of appropriate risk management practices in daily operations. Financial risks are an exception. The management of liquidity, currency and interest rate risks is conducted in the Corporate Finance department. The management of commodity price risks takes place in the Global Procurement unit or in authorized Group companies.
- The BASF Group's management is informed of short-term operational opportunities and risks that fall within an observation period of up to one year in the monthly management report produced by Corporate Finance. In addition, Corporate Finance provides information twice a year on the aggregated opportunity/risk exposure of the BASF Group. Furthermore, any arising individual risks which have an impact of more than €10 million on earnings or risks qualitatively evaluated to have a material impact, such as reputational risks, must be reported immediately.
- As part of strategy development, the Corporate Development department additionally conducts strategic opportunity/risk analyses with a 10-year assessment period. These analyses are annually reviewed as part of strategic controlling and are adapted if necessary. Scenarios were also developed to map possible impacts beyond the ten-year horizon, for example from climate-related developments.
- We also regularly consider exceptional situations at global, regional and local level – from process safety incidents and goods spillages to pandemics and cyberattacks – which occur very rarely but can have a fundamental impact. In addition, a crisis organization exists to proactively create contingency plans where necessary and appropriate. The crisis management organization is activated in the event of a sudden crisis.
- BASF's CCO manages the implementation of our Compliance Management System, supported by additional compliance officers worldwide. The CCO regularly reports to the Board of Executive Directors on the status of implementation as well as on any significant results and provides a status report to the Supervisory Board's Audit Committee at least once a year, including any major developments. The Board of Executive

For more information on health and safety and emergency response, see page 125 onward

Directors immediately informs the Audit Committee about significant incidents.

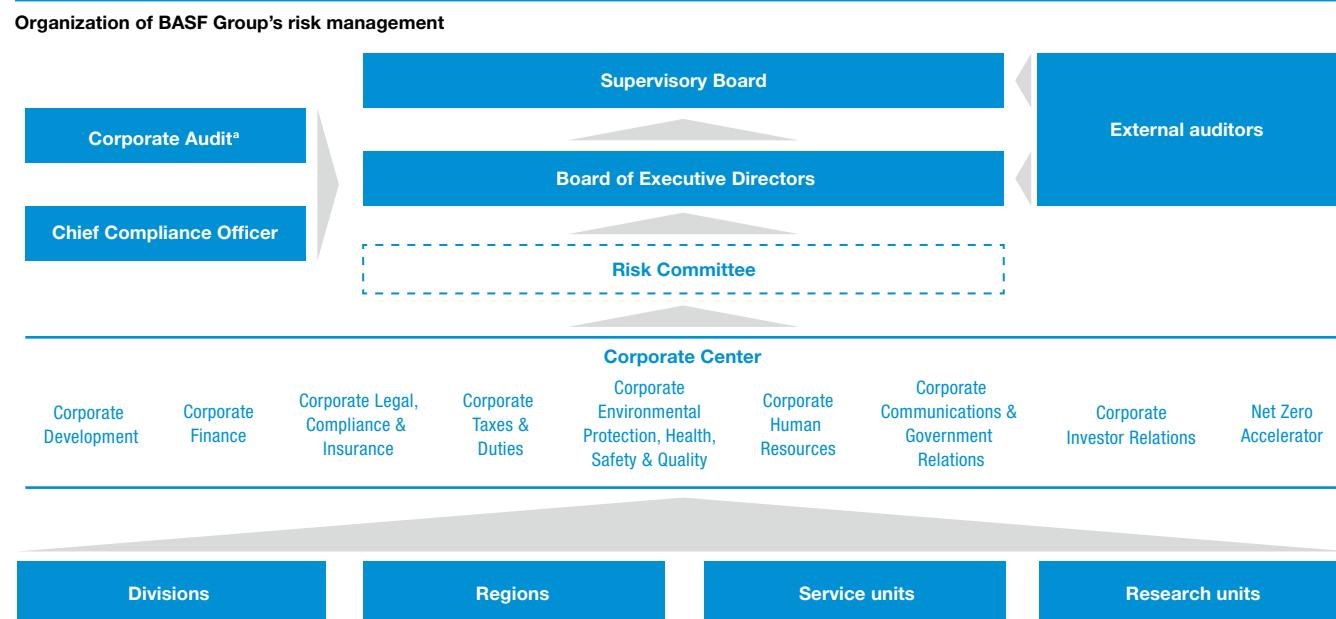
 For more information on compliance, compliance management and monitoring adherence to our compliance principles, see page 179 onward

- Risk-specific monitoring and control systems, some of which are decentralized, have been set up for each area identified in the risk portfolio. The results of the monitoring processes are incorporated into regular risk reporting to the Risk Committee and the Board of Executive Directors. Compared with internal control systems in financial reporting, these monitoring systems have a lower degree of formalization.
- The Corporate Audit department is responsible for regularly auditing the effectiveness and appropriateness of the risk management system, internal control systems and the compliance management system. In addition, the Supervisory Board's Audit Committee addresses the effectiveness and appropriateness of these systems as part of its monitoring activities. The suitability of the early risk detection system set up by the Board of Executive Directors in accordance with section 91(2) of the German Stock Corporation Act is assessed and evaluated by the auditors.

Tools

- The Governance, Risk Management, Compliance (GRC) Policy, applicable throughout the Group, forms the framework for risk management and is implemented by the operating divisions, the service and research units and the regions according to their specific business conditions.
- A catalog of opportunity and risk categories helps identify all relevant financial and sustainability-related opportunities and risks relating to our targets as comprehensively as possible. Here, we take into account topics identified by the materiality analysis that we have an impact on and that have an impact on us, in line with the principle of double materiality.

 For more information on the materiality analysis, see page 46 onward



a The Corporate Audit department is part of the Corporate Center.

- We also systematically assess opportunities and risks with effects that cannot yet be measured in monetary terms, such as climate and reputational risks. To reflect these, risks for companies in connection with the transition to a low-carbon economy (transition risks) as well as physical risks as defined by the Task Force on Climate-related Financial Disclosures (TCFD), among others, were added to this catalog.
- Because global climate policy ambitions and the implementation of the relevant measures play a decisive role in the ongoing growth of the chemical industry and its customer industries, we defined and quantified global long-term scenarios (up to 2050) with various global warming paths. To assess the impact of different global climate policy approaches on our business units, the scenarios were discussed by the business units in workshops. Feedback was incorporated into the ongoing development of the scenarios. A dataset of scenario-specific macroeconomic

parameters will be provided to test the economic feasibility of investments and business strategies.

 For more information on our sustainability management processes, see page 45 onward

- We use standardized evaluation and reporting tools for the identification and assessment of risks. The aggregation of opportunities, risks and sensitivities at division and Group level using a Monte Carlo simulation helps us to identify effects and trends across the Group. We also aggregate qualitatively assessed risks at Group level using a risk portfolio.
- Our Group-wide Compliance Program aims to ensure adherence to legal regulations and the company's internal guidelines. Our global employee Code of Conduct firmly embeds these mandatory standards into everyday business. Members of the Board of Executive Directors are also expressly obligated to follow these principles.

 For more information on our Group-wide Compliance Program, see page 179 onward

- Based on the reviews and findings of the risk management process, the Board of Executive Directors has no indication that BASF's risk management system, including the internal control system, is not adequate or effective in its entirety.

Significant features of the internal control and risk management system with regard to the Group financial reporting process

The Group Management's Report and the Consolidated Financial Statements are prepared by a unit in the Corporate Finance department. The Consolidated Financial Statements are derived from the separate financial statements of the subsidiaries and joint operations, taking into account the relevant data for the joint ventures and associated companies accounted for using the equity method. The BASF Group's accounting process is based on a uniform accounting guideline that, alongside accounting policies based on the International Financial Reporting Standards applicable in the European Union, defines the significant processes and deadlines for the Group. There are binding directives for the internal reconciliations and other accounting operations within the Group. Standard software is used to carry out the accounting processes for the preparation of the individual financial statements as well as for the Consolidated Financial Statements. There are clear rules for the access rights of each participant in these processes.

Employees involved in the accounting and reporting process meet the qualitative requirements and participate in training on a regular basis. There is a clear assignment of responsibilities between the specialist units, companies and service units involved. We strictly adhere to the principles of segregation of duties and dual control or the "four-eyes principle." Complex actuarial reports and evaluations are produced by specialized service providers or specially qualified employees.

An internal control system for financial reporting continuously monitors these principles. To this end, methods are provided to ensure that evaluation of the internal control system in financial

reporting is structured and uniform across the BASF Group. They also work in accordance with the international risk management standard, COSO II Enterprise Risk Management – Integrated Framework.

Material risks for the BASF Group regarding a reliable control environment for proper financial reporting are reviewed and updated on an annual basis. Risks are compiled into a central risk catalog.

Moreover, a centralized selection process identifies companies that are exposed to particular risks, that are material to the Consolidated Financial Statements of the BASF Group, or that provide service processes. The selection process is conducted annually. Persons responsible for implementing the requirements for an effective control system in financial reporting are appointed at the relevant companies.

The process for identifying, evaluating, managing and controlling risks related to preparing the Consolidated Financial Statements as well as monitoring these processes in the selected companies comprises the following steps:

– Evaluation of the control environment

Adherence to internal and external guidelines that are relevant to the maintenance of a reliable control environment is checked by means of a standardized questionnaire.

– Identification and documentation of control activities

In order to mitigate the risks to the financial reporting processes listed in our central risk catalog, critical processes and control activities are documented.

– Assessment of control activities

After documentation, a review is performed to verify whether the described controls are capable of adequately covering the risks. In the subsequent test phase, spot checks are carried out to test whether, in practice, the controls were executed as described and effective.

– Monitoring of control weaknesses

The responsible leaders receive reports on any control weaknesses identified and their resolution, and an interdisciplinary committee investigates their relevance to the BASF Group. The

Board of Executive Directors and the Audit Committee are informed if control weaknesses with a considerable impact on financial reporting are identified. Only after material control weaknesses have been resolved does the company's managing director confirm the effectiveness of the internal control system.

– Internal confirmation of the internal control system

All managing directors and chief financial officers of each consolidated Group company must confirm to the Board of Executive Directors of BASF SE every half-year and at the end of the annual cycle, in writing, that the internal control system is effective with regard to accounting and reporting.

Operational opportunities and risks

Market growth

The development of our sales markets is one of the strongest sources of opportunities and risks. For more details on our assumptions regarding short-term growth rates for the global economy, regions and key customer industries, such as the chemicals, automotive and construction sectors, see Economic Environment in 2023 on pages 151 to 154.

We also consider opportunities and risks caused by deviations in assumptions. Macroeconomic opportunities arise from an easing of geopolitical conflicts and the resulting reduction in bottlenecks in the supply of energy, industrial raw materials and other intermediate goods. The complete reversal of restrictions to contain the coronavirus pandemic in China and the rapid opening up of the country may also boost global demand more than assumed in our baseline forecast.

Conversely, a significant macroeconomic risk arises from prolonged lockdowns again being imposed to contain the coronavirus, impacting global supply chains and supply and demand. Further increases in energy prices caused, for example, by the war in Ukraine, and the even higher inflation rates resulting from this for manufacturer and consumer prices also pose a risk to the economy. Additional macroeconomic risks result from the escalation of

geopolitical conflicts and a further intensification of the trade conflict between the United States and China.

Weather-related influences can result in positive or negative effects on our business, particularly in the Agricultural Solutions segment.

Margins

Opportunities and risks for the BASF Group primarily result from higher or lower margins in the Chemicals and Materials segments in particular. Further increases in energy and raw materials prices and raw materials shortages for a number of products and value chains, mainly due to the war in Ukraine, could further increase pressure on margins. This would have a negative effect on our EBIT.

The year's average oil price for Brent crude was \$101 per barrel in 2022, compared with \$71 per barrel in the previous year. For 2023, we anticipate an average oil price of \$90 per barrel.

There is high uncertainty, especially surrounding the development of gas prices and the availability of natural gas in Europe in particular. The overall assessment therefore does not include any opportunities and risks that could arise from the volatility of European gas prices (see "Overall assessment").

Competition

We continuously enhance our products and solutions in order to remain competitive. We monitor the market and the competition, and try to take targeted advantage of opportunities and counter emerging risks with suitable measures. Aside from innovation, key components of our competitiveness are our ongoing cost management and continuous process optimization.

Regulation/policy

Risks for us can arise from intensified geopolitical tensions, new trade sanctions, stricter emissions limits for plants, and stricter energy and chemicals legislation in the E.U.

Political measures could also give rise to opportunities. For example, we view measures around the world to increase energy efficiency

and reduce greenhouse gas emissions as a strategic opportunity for increased demand for products such as our insulation foams for buildings, catalysts, battery materials for electromobility, or our solutions for wind turbines.

Procurement

We minimize procurement risks through our broad portfolio, global purchasing activities and the purchase of raw materials on spot markets. We avoid sourcing raw materials from a single supplier wherever possible by creating and leveraging competition. We continually monitor all risks on the procurement markets, for example, the risk of default by important business partners. We take measures to avoid risks or minimize their effects.

Supply chain

We address the risk of supply interruptions on the procurement and sales side caused, for example, by extreme weather conditions (such as high/low water levels on rivers, heat/cold waves and hurricanes), the frequency and intensity of which are increasing as a result of climate change, by switching to alternative transportation solutions and the possibility of falling back on other sites within our global Verbund.

Investments/production

We try to prevent unscheduled plant shutdowns by adhering to high technical standards and by continuously improving our plants. We reduce the effects of an unscheduled shutdown on the supply of intermediate and end products through diversification within our global production Verbund.

In the event of a production outage – caused by an accident, for example – our global, regional or local emergency response plans and crisis management structures are engaged, depending on the scope of impact. Every region has crisis management teams on a local and regional level. They not only coordinate the necessary emergency response measures, they also initiate immediate measures for damage control and resumption of normal operations as quickly as possible.

Crisis management also includes dealing with extreme weather conditions such as hurricanes (for example, at the sites on the Gulf of Mexico in Freeport, Texas, and Geismar, Louisiana) or significantly elevated water temperatures in rivers due to extended heat waves, which limit the available cooling capacity. Appropriate precautions are taken at the sites in the case of a potential change in risk associated with climate change. For example, due to an increase in heat waves, we have implemented several measures at the Verbund site in Ludwigshafen, Germany, and at the Geismar site in Louisiana in recent years to increase cooling capacity, such as expanding and optimizing the central recooling plants and optimizing cooling water flows. These optimization measures are designed to prevent production outages due to extreme heat waves.

Short-term risks from investments can result from, for example, technical malfunctions or schedule and budget overruns. We counter these risks with stringent project management and controlling.

Acquisitions/divestitures/cooperations

We constantly monitor the market in order to identify possible acquisition targets and develop our portfolio appropriately. In addition, we collaborate with customers and partners to jointly develop new, competitive products and applications.

Acquisitions and divestments entail both opportunities and risks. These arise in connection with the conclusion of a transaction, or it being completed earlier or later than expected. They relate to the regular earnings contributions gained or lost as well as the realization of gains or losses from divestitures if these deviate from our planning assumptions.

 For more information on opportunities and risks from agreed transactions, see page [40](#)

Personnel

Due to BASF's worldwide compensation principles, the development of personnel expenses is partly dependent on the amount of variable compensation, which is linked to the company's success, among other factors. The correlation between variable compensation and the success of the company has the effect of minimizing risk. Another factor is the development of interest rates for discounting pension obligations. Furthermore, changes to the legal environment of a particular country can have an impact on the development of personnel expenses for the BASF Group. For countries in which BASF is active, we therefore constantly monitor the relevant developments in order to identify potential risks at an early stage and enable suitable measures to be taken.

 For more information on our compensation system, see page [105](#)

For more information on risks from pension obligations, see page [164](#)

Information technology

BASF employs a large number of IT systems. We use technologies such as big data and the Internet of Things to develop new business models, corporate concepts and strategies and to respond appropriately to changing customer behavior. The global cyber security team is tasked with protecting these IT systems and the data and business processes they handle. In a connected, ever-evolving world, the challenge of protecting BASF against attackers is becoming ever greater and more complex.

The threat environment has changed in recent years, as attackers have become better organized, use more sophisticated technology and have far more resources available. This development reflects the fact that internet-based cyberattacks are extremely lucrative: A variety of vulnerabilities in software and hardware products constantly provide new incentives to develop malware, and anonymization technologies make it almost impossible to trace and punish attacks.

A successful attack can, for example, negatively affect plant availability, delivery quality or the accuracy of our financial reporting. Unauthorized access to sensitive data, such as personnel records or customer data, competition-related information or research results, can result in legal consequences or jeopardize our competitive position. This could also cause monetary losses, a potential loss of reputation and even a loss of customers' and partners' confidence in the security of our products and services.

To minimize such risks, BASF uses globally uniform processes and systems to ensure IT availability and IT security. These include stable and redundantly designed IT systems, backup processes, virus and access protection, encryption systems, and integrated and standardized IT infrastructure and applications. The systems used for information security are constantly tested, continuously updated, and expanded if necessary. In addition, our employees receive regular training on information and data protection. IT-related risk management is conducted using Group-wide regulations for organization and application, as well as an internal control system based on these regulations.

We employ modern security concepts to keep pace with advanced attackers. These range from efficient detection and professional response to defense against attacks and minimizing their potential impact. Strong cyber security alliances are also crucial here. BASF works closely with security authorities and security associations, for example as a founding member of the German Cyber Security Organization (DCSO) and the Cyber Security Sharing and Analytics (CSSA) platform in Berlin, Germany.

BASF has also established an information security management system and is internationally certified according to DIN EN ISO/IEC 27001:2017.

Compliance/legal

We constantly monitor current and potential legal disputes and proceedings, and regularly report on these to the Board of Executive Directors and Supervisory Board. In order to assess the risks from current legal disputes and proceedings and any potential need to recognize provisions, we prepare our own analyses and assessments of the circumstances and claims considered. In addition, in individual cases, we consider the results of comparable proceedings and, if needed, independent legal opinions. Risk assessment is particularly based on estimates as to the probability of occurrence and the range of possible claims. These estimates are the result of close cooperation between the relevant operating and service units together with Corporate Legal and Corporate Finance. If sufficient probability of occurrence is identified, we recognize a provision for the proceeding concerned. Should a provision be unnecessary, we continue to assess whether these litigations nevertheless represent a risk for the BASF Group's EBIT as part of general risk management.

We use our internal control system to limit risks from potential infringements of rights or laws. For example, we try to avoid patent and licensing disputes whenever possible through extensive clearance research. As part of our Group-wide Compliance Program, our employees receive regular training.

Tax

The recognized tax-related opportunities and risks only concern taxes that impact the BASF Group's EBIT in the short term. These arise when BASF has taken a position that differs from the opinion of a competent administrative authority. If a tax payment has already been made and could be reclaimed, we present this as an opportunity. If, on the other hand, a potential payment is outstanding in accordance with the administrative opinion, this is a risk. We primarily evaluate opportunities and risks with regard to their probability of occurrence and, if necessary, set up a provision for the relevant risk. If a provision is not necessary, we take this into account in determining EBIT-relevant risks for the BASF Group.

Financial opportunities and risks

Detailed guidelines and procedures exist for dealing with financial risks. Among other things, they provide for the segregation of financial instrument trading and back office functions.

We continuously monitor activities in countries with transfer restrictions as a part of risk management. This includes, for example, regular analysis of the macroeconomic and legal environment, shareholders' equity and the business models of the operating units. The chief aim is the management of counterparty, transfer and currency risks for the BASF Group.

Exchange rate volatility

Our competitiveness on global markets is influenced by fluctuations in exchange rates. For BASF's sales, opportunities and risks arise in particular when the U.S. dollar exchange rate fluctuates. A full-year appreciation of the U.S. dollar against the euro by \$0.01 would increase the BASF Group's EBIT by around €30 million, assuming other conditions remain the same. On the production side, we counter exchange rate risks by producing in the respective currency zones.

Financial currency risks result from the translation of receivables, liabilities and other monetary items in accordance with IAS 21 at the closing rate into the functional currency of the respective Group company. In addition, we incorporate planned purchase and sales transactions in foreign currencies into our financial foreign currency risk management. If necessary, we hedge these risks using derivative instruments.

Interest rate risks

Interest rate risks result from potential changes in prevailing market interest rates. These can cause a change in the fair value of fixed-rate instruments and fluctuations in the interest payments for variable-rate financial instruments, which would positively or negatively affect earnings. To hedge these risks, we use interest rate swaps and combined interest rate and currency derivatives in individual cases.

In addition to market interest rates, BASF's financing costs are determined by the credit risk premiums to be paid. These are mainly influenced by our credit rating and the market conditions at the time of issue. In the short to medium term, BASF is largely protected from the possible effects on its interest result thanks to the balanced maturity profile of its financial indebtedness.

Risks from metal and raw materials trading

Some of BASF's divisions are exposed to strong fluctuations in raw materials prices. BASF uses commodity derivatives to hedge these market price risks. In addition, BASF holds limited unhedged precious metal and oil product positions for trading on its own account. The value of these positions is exposed to market price volatility. Adverse changes in market prices negatively affect the earnings and equity of BASF. These risks are continuously monitored by a central risk management system and limited by strict guidelines.

Liquidity risks

Risks from fluctuating cash flows are recognized in a timely manner as part of our liquidity planning. We have access to extensive liquidity at any time thanks to our good ratings, our unrestricted access to the commercial paper market and committed bank credit lines.

In the short to medium term, BASF is largely protected against potential refinancing risks by the balanced maturity profile of its financial indebtedness as well as through diversification in various financial markets.

Risk of asset losses

We limit country-specific risks with measures based on country ratings, which are continuously updated to reflect changing environment conditions. We selectively use investment guarantees to limit specific country-related risks. We lower credit risks for our financial investments by engaging in transactions only with banks with good credit ratings and by adhering to fixed limits. We continuously monitor creditworthiness and adjust limits accordingly. We reduce the risk of default on receivables by continuously monitoring the creditworthiness and payment behavior of our customers and by setting appropriate credit limits. Risks are also limited through the use of credit insurance and individual hedging strategies, such as guarantees. Due to the global activities and diversified customer structure of the BASF Group, there are no major concentrations of credit default risk.

Impairment risks

Asset impairment risk arises if the assumed interest rate in an impairment test increases, the predicted cash flows decline, or investment projects are suspended. We currently consider the risk of further impairment for assets such as property, plant and equipment, goodwill, technologies and trademarks to be immaterial. This could change if European gas prices remain at a high level in the longer term.

We are resolutely pursuing our path to climate neutrality. This includes the construction of one of the world's largest heat pumps in Ludwigshafen, Germany, the increased use of green electricity and investments in offshore wind energy. For this reason, current developments and measures relating to sustainability do not lead to fundamentally changed expectations with regard to useful lives or recoverability of our assets.

Climate policies are also causing fundamental changes in the automotive industry, one of BASF's key customer industries. The transition to electromobility will have a long-term negative impact on the emissions catalyst business. This development was accounted for in the adjustment of the growth rate for the goodwill impairment test and did not lead to an impairment. Other BASF businesses will benefit from this transformation; for example, demand for innovative lightweight components and battery materials will grow.

Long-term incentive program for senior executives

Since 2020, BASF has offered its leaders the opportunity to participate in a long-term incentive program (LTI program) in the form of a performance share plan. The LTI plan incentivizes the achievement of strategic growth, profitability and sustainability targets and takes into account the development of the BASF share price and the dividend. The need for provisions for this program varies according to assumptions on the degree of strategic target achievement, the development of the BASF share price and the dividend. This leads to a corresponding increase or decrease in personnel costs.

Until 2020, BASF offered leaders the opportunity to participate in a share price-based compensation program. The need for provisions for this program varies according to the development of the BASF share price and the MSCI World Chemicals Index; this leads to a corresponding increase or decrease in personnel costs.

Risks from pension obligations

BASF grants most employees company pension benefits from either defined contribution or defined benefit plans. We predominantly finance company pension obligations externally through separate plan assets. This particularly includes BASF Pensionskasse WaG and BASF Pensionstreuhand e.V. in Germany, in addition to the large pension plans of our Group companies in North America, the United Kingdom and Switzerland. To address the risk of underfunding due to market-related fluctuations in plan assets, we have investment strategies that align return and risk optimization to the structure of the pension obligations. Stress scenarios are also simulated regularly by means of portfolio analyses. Adjustments to the interest rates used in discounting pension obligations leads immediately to changes in equity. To limit the risks of changing financial market conditions as well as demographic developments, BASF has, for a number of years now, offered its employees almost exclusively defined contribution plans for future years of service. Some of these contribution plans include minimum interest guarantees. If the pension fund cannot generate this, it must be provided by the employer. A sustained low interest rate environment could make it necessary to recognize pension obligations and plan assets for these plans as well.

Strategic opportunities and risks

Long-term demand development

We assume that growth in chemical production (excluding pharmaceuticals) will be higher than that of the global gross domestic product over the next five years and about as strong as the five-year average prior to the coronavirus pandemic. Through our market-oriented and broad portfolio, which we will continue to strengthen in the years ahead, for example, through investments in new production capacities, research and development activities or acquisitions, we aim to achieve volume growth that slightly exceeds this market growth. Should global economic growth see unexpected, considerable deceleration, for example, because of prolonged restrictions due to the coronavirus pandemic, an ongoing weak period in the emerging markets, protectionist tendencies, geopolitical conflicts or bottlenecks in the energy markets leading to permanently elevated energy prices (particularly for natural gas in Europe), the expected growth rates could prove too ambitious.

Moreover, the ambitions of global climate policy and its implementation will significantly impact the structure of demand from our customer industries. This is shown by a comparison of a climate policy scenario (global warming of no more than two degrees Celsius in 2100 compared with pre-industrial times) with an alternative scenario that allows for more warming. In an ambitious climate policy scenario, the structure of demand changes due to the use of alternative energy sources and raw materials, high investment in resource-conserving technologies, and changing customer preferences. By contrast, macroeconomic growth rates typically vary little compared with a scenario with a higher warming path.

Market opportunities in such a scenario include, for example, additives that make plastics easier to recycle, alternative surface coatings for wind and solar modules, stronger demand for insulation materials for buildings, increased electromobility with changed demand for plastics, insulation materials, coolants and battery materials, and more alternative proteins in agriculture. By contrast,

fossil feedstocks and the production technologies and product segments based on fossil feedstocks will become less important.

For more information on the corporate strategy, see page 26 onward

Development of competitive and customer landscape

We expect competitors from Asia, North America and the Middle East in particular to gain increasing significance in the years ahead, especially as a result of advantageous raw materials and energy prices. Furthermore, we predict that many producers in countries rich in raw materials will expand their value chains in consumer-oriented sectors. In addition, the proliferation of large-scale digital marketplaces for chemicals could impact existing customer and supplier relationships.

We expect a continuous rise in customer demand for sustainable solutions, for example, products with a low carbon footprint, made from recycled, circular, or bio-based raw materials that are biodegradable, or products with other measurable sustainability benefits. However, an increase in customer demand for sustainable solutions is also highly dependent on regulation. Companies with a proven track record of providing more sustainable solutions will be able to achieve higher growth and profitability as a result. The expansion of sharing economy business models could have a long-term impact on demand in individual customer industries. At the same time, higher demands on product features can also create opportunities for innovation. We are therefore addressing these topics in research and investment programs for the sustainable transformation of BASF.

To strengthen our competitiveness, we are continuously improving our production processes, streamlining our administration and simplifying workflows and processes. Our research and business focus is on highly innovative businesses and differentiation through sustainability advantages to make our customers and BASF more successful.

Regulation/policy

We expect continued regulatory and societal pressure to achieve climate-neutral energy production, climate-neutral energy consumption, and a climate-neutral resource and raw material base. The political approaches to address these issues will vary greatly from region to region. However, particularly in Europe, we expect measures with a continuously high level of detailed regulation, including changes to chemical and industry-related regulations, that have the potential to significantly impact the competitiveness of BASF's operations and product portfolio as well as that of our customers.

We see the risk of the current geopolitical shift in balance of power leading to the establishment of uncoordinated or divergent global legislative standards and regulatory systems, not just in relation to chemicals or the regulatory framework for digitalization, but also to environmental, social and corporate governance criteria. We also see risks, but also opportunities, in the setting of international standards for specific product categories or technologies.

We explain our strategy in meetings with political decision-makers and social stakeholders. In doing so, we also inform ourselves of the changes we must undergo and advocate for a favorable and stable regulatory framework at both the national and international levels. We consider BASF to be in a strong position to contribute solutions toward achieving U.N. development goals, particularly regarding climate neutrality, through new technologies, innovative products and processes and our broad product portfolio.

Innovation

We expect the trend toward increased sustainability requirements in our customer industries to continue. Our aim is to leverage the resulting opportunities in a growing market with even more sustainable innovations. The key areas are products with a lower carbon footprint or even a carbon footprint of net zero, circular economy solutions, and safe and sustainable products. To be successful in these fields, we have launched specific research and investment

programs for the sustainable transformation of BASF. Furthermore, in order to steer our innovation portfolio toward increased sustainability, we began applying the Sustainable Solution Steering method to the evaluation of innovation projects and integrated it at an early stage of our research and development processes.

There are technical and commercial risks of failure associated with every single research and development project. We also address this by maintaining a balanced and comprehensive project portfolio as well as through professional, milestone-based project management.

Further risks may arise from increasing state protectionism and the demand for localization of intellectual property in order to achieve technological independence. Through our Know-how Verbund in research and development, we ensure that critical intellectual property is generated and protected in countries with high intellectual property standards.

We expect that the digital disruption of established processes will lead to a sharp increase in efficiency and effectiveness in some fields. BASF is therefore committed to taking a leading role in the digital transformation of the chemical industry. Possible applications of digital technologies and solutions are evaluated along the entire value chain and implemented throughout the company, for example, in production, logistics, research and development, business models and corporate governance.

For more information on innovation, see page 49 onward

Procurement and supply chain

Supply security for raw materials, energy and services is increasingly affected by trade disputes, protectionism, sanctions and geopolitical conflict. As far as the current energy price level in Europe is concerned, we expect the supply situation to ease in the mid- to long term. Furthermore, our accelerated transformation toward renewable energy will make the company less dependent on fossil energy sources. In addition, supply chains are increasingly threatened by disruptions such as suppliers' production bottlenecks, interrupted logistics chains, extreme weather events and longer-lasting effects from the coronavirus pandemic. Climate change and extreme weather events are impacting the availability of renewable resources.

Transportation is significantly affected by structural capacity constraints (for example, a lack of truck drivers, traffic jams due to inadequate logistics infrastructure, worker shortages at ports) and increased transportation costs.

We are seeing an ongoing expansion of the regulatory framework affecting us and our suppliers (for example, the German Supply Chain Due Diligence Act). Potential non-compliance by our suppliers may lead to a reduced supplier base. Moreover, the use of renewable energies depends largely on favorable prices and framework conditions.

All risks are continuously analyzed and appropriate strategies and measures developed to avert risks or minimize the impact on BASF.

Investments/production/infrastructure

We expect growth in chemical production in emerging markets to remain above the global average in the years to come. This will create opportunities that we want to exploit by expanding our local presence. In addition, regional value chains help mitigate risks from trade conflicts and barriers that pose a challenge to global markets and supply chains.

Decisions on the type, scope and location of our investment projects are made on the basis of established comprehensive assessment processes. They take into account long-term forecasts for the market, margin and cost development, and raw materials availability, as well as country, currency, sustainability and technology risks. Opportunities and risks arise from potential deviations in actual developments from our assumptions. Mitigation plans are in place where risks are substantial.

Investments in more sustainable technologies represent a long-term opportunity, even though they may not be competitive or profitable in the short term, depending on the market and the prevailing regulatory framework.

To assess the changing risks for our sites from climate change, climate data based on the latest scenarios of the Intergovernmental Panel on Climate Change (IPCC) were compiled for our sites in cooperation with an external partner. This enables the sites to assess the potential impact of climate change in the coming decades. Here, we focus on a climate protection scenario, supplemented by two scenarios with medium and high levels of global warming.¹ The most common potential impact is an increase in heat and drought. The sites are supported by this information in the development of their strategies.

The availability of our production plants and infrastructure can be negatively affected by system downtime, confidentiality breaches or manipulation of data in critical IT systems and applications. The threat environment has changed in recent years, as attackers have become better organized, use more sophisticated technology and have far more resources available.

 For more information on our investment projects, see page 156

Acquisitions/divestitures/cooperations

In the future, we will continue to expand and refine our portfolio through smaller, bolt-on acquisitions that promise above-average profitable growth, are innovation-driven or offer a technological differentiation and help achieve a relevant market position, and make new, sustainable business models possible.

The evaluation of opportunities and risks plays a significant role during the assessment of acquisition targets. A detailed analysis and quantification is conducted as part of due diligence. Examples of risks include increased staff turnover, delayed realization of synergies, or the assumption of obligations that were not precisely quantifiable in advance. If our expectations in this regard are not met, risks could arise, such as a need for impairment. Opportunities could also arise, for example, from additional synergies. Furthermore, business carve-outs and divestitures play a key role in the development and optimization of our portfolio. In this context, risks could arise as a result of potential warranty claims or other contractual obligations, such as long-term supply agreements.

 For more information on our acquisitions and divestitures, see page 40

Personnel

BASF anticipates growing challenges in attracting qualified employees in the medium and long term due to demographic change, especially in North America and Europe. As a result, there is an increased risk that job vacancies may not be filled or only after a delay. We address these risks with measures to integrate diversity, employee and leadership development, and intensified employer branding. At local level, demographic management includes succession planning, knowledge management and offerings to improve the balance between personal and professional life, and promote healthy living. This increases BASF's appeal as an employer and retains our employees in the long term.

 For more information on individual initiatives and our targets, see page 101 onward

¹ The assessment model was based on the IPCC climate change scenario SSP1-2.6, supplemented by SSP2-4.5 (medium global warming scenario) and SSP5-8.5 (high global warming scenario).

Sustainability

The positive contributions and negative impacts of our business activities on sustainability topics along the value chain, and the impact of sustainability topics on our business were assessed in a new materiality analysis carried out in 2022. Opportunities and risks for our business activities that could arise from material sustainability topics, or for sustainability topics that could arise from our business activities, can only rarely be measured in specific financial terms and mainly have a medium to long-term impact. We are already seizing business opportunities, for example, through products with specific sustainability attributes (such as raw materials based on biomass or recycled content) or intensified customer relations based on common sustainability ambitions. Relevant sustainability topics are systematically integrated into our strategic risk management.

We reduce potential risks in the areas of environmental protection, safety and security, health protection, product stewardship, compliance, supplier relationships and human rights (including labor, social and quality standards) by setting ourselves globally uniform requirements. These sometimes go beyond local legal requirements. Our globally applicable Code of Conduct defines a binding framework for the activities of all BASF employees, leaders and members of the Board of Executive Directors. To ensure compliance with our internal and external standards, we have global management systems in place and monitor their implementation internally by means such as global surveys and audits. These also cover human rights topics in line with statutory regulations such as the German Supply Chain Due Diligence Act. Our measures are regularly reviewed and adapted as necessary to ensure the protection of human rights in our value chains and consequently, the continuity of our business relationships.

Expectations of suppliers are laid down in our global Supplier Code of Conduct. We have suppliers with a high potential sustainability risk evaluated by third parties, either through sustainability evaluations or on-site audits. The monitoring systems are complemented by grievance mechanisms that are open to all stakeholders, such as our compliance hotlines.

Ongoing climate change also poses opportunities and risks for BASF. As an energy-intensive company, climate-related risks arise particularly from regulatory changes, such as in carbon prices through emissions trading systems, taxes or energy legislation. In addition, BASF's emissions footprint and intensity could lead to a negative perception and reduced appeal among external stakeholders such as customers or investors. We counter these risks with our carbon management measures and by transparently disclosing our positions on and contributions to climate protection, for example, in the form of political demands or through progress in the implementation of our climate strategy, in publicly accessible sources such as this annual report or on the BASF website, and in direct dialog with external stakeholders.

In addition to climate-related risks, there are also opportunities. Our broad product portfolio includes solutions for the circular economy and climate protection (such as insulation foams for buildings, materials for electromobility and bio-based products). Increased social awareness offers additional market opportunities for these products. We are working with numerous scientific and public organizations and initiatives on solutions for sustainable agriculture that meet economic, environmental and social demands over the long term.

Our decentralized specialists use a central decision tree to document reportable sustainability risks within the meaning of section 289b et seq. of the German Commercial Code. No reportable residual net risks within the meaning of section 289b et seq. of the German Commercial Code were identified for 2022.

 For more information on sustainability management, see page [45](#) onward

For more information on energy and climate protection, see page [135](#) onward

For more information on opportunities and risks from energy policies, see page [161](#)

 For more information on our positions on and contributions to climate protection, see bASF.com/climateprotection