



BASF Factbook

Information for investors and analysts

Published June 2022

 **BASF**

We create chemistry

Cautionary note regarding forward-looking statements

This publication contains forward-looking statements. These statements are based on current estimates and projections of the Board of Executive Directors and currently available information. Forward-looking statements are not guarantees of the future developments and results outlined therein. These are dependent on a number of factors; they involve various risks and uncertainties; and they are based on assumptions that may not prove to be accurate. Such risk factors include those discussed in Opportunities and Risks on pages 151 to 160 of the BASF Report 2021. BASF does not assume any obligation to update the forward-looking statements contained in this publication above and beyond the legal requirements.



R&D center for catalysts, Ludwigshafen, Germany

The pilot plant facility houses highly automated experimental facilities for efficient process development and testing of new process catalysts. Chemical lab technician Melanie Zier (left) and operations manager assistant Dirk Boehm (right) carry out a check at the test facility for gas-phase hydrogenation in the pilot plant.

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BASF Group

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At a Glance

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. Around 111,000 employees contribute to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio comprises six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions.

Smart Verbund concept

applied to production, technology, market, digitalization

With companies in 90 countries

we contribute to our customers' success

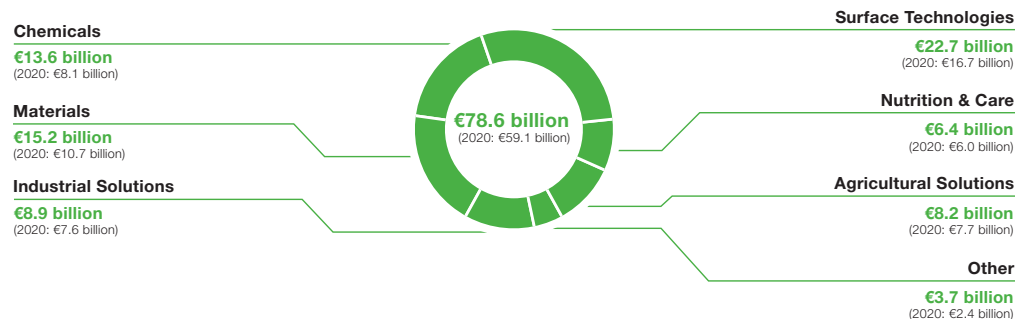
Broad portfolio

6 segments, 11 operating divisions, 75 strategic business units

Organizational development

for greater customer proximity, increased competitiveness and profitable growth

Sales by segment and Other in 2021



Key figures

Million €

	2017	2018	2019	2020	2021
Sales	61,223 ¹	60,220 ²	59,316	59,149	78,598
Income from operations before depreciation, amortization and special items	10,738 ¹	9,271 ²	8,324 ³	7,435	11,348
Income from operations before depreciation and amortization (EBITDA)	10,765 ¹	8,970 ²	8,185 ³	6,494	11,355
Income from operations (EBIT) before special items	7,645 ¹	6,281 ²	4,643 ³	3,560	7,768
Income from operations (EBIT)	7,587 ¹	5,974 ²	4,201 ³	-191	7,677
Net income	6,078	4,707	8,421	-1,060	5,523
Return on capital employed (ROCE)	% 15.4	12.0 ²	7.7	1.7	13.7 ⁴
Earnings per share (EPS)	€ 6.62	5.12	9.17	-1.15	6.01
Adjusted earnings per share (EPS)	€ 6.44	5.87	4.00	3.21	6.76
Dividend per share	€ 3.10	3.20	3.30	3.30	3.40
Dividend yield ⁵	% 3.38	5.30	4.90	5.10	5.50
Cash flows from operating activities	8,785	7,939	7,474	5,413	7,245
Free cash flow	4,789	4,045	3,650	2,284	3,713

¹ Figures for 2017 were restated with the presentation of the oil and gas activities as discontinued operations.

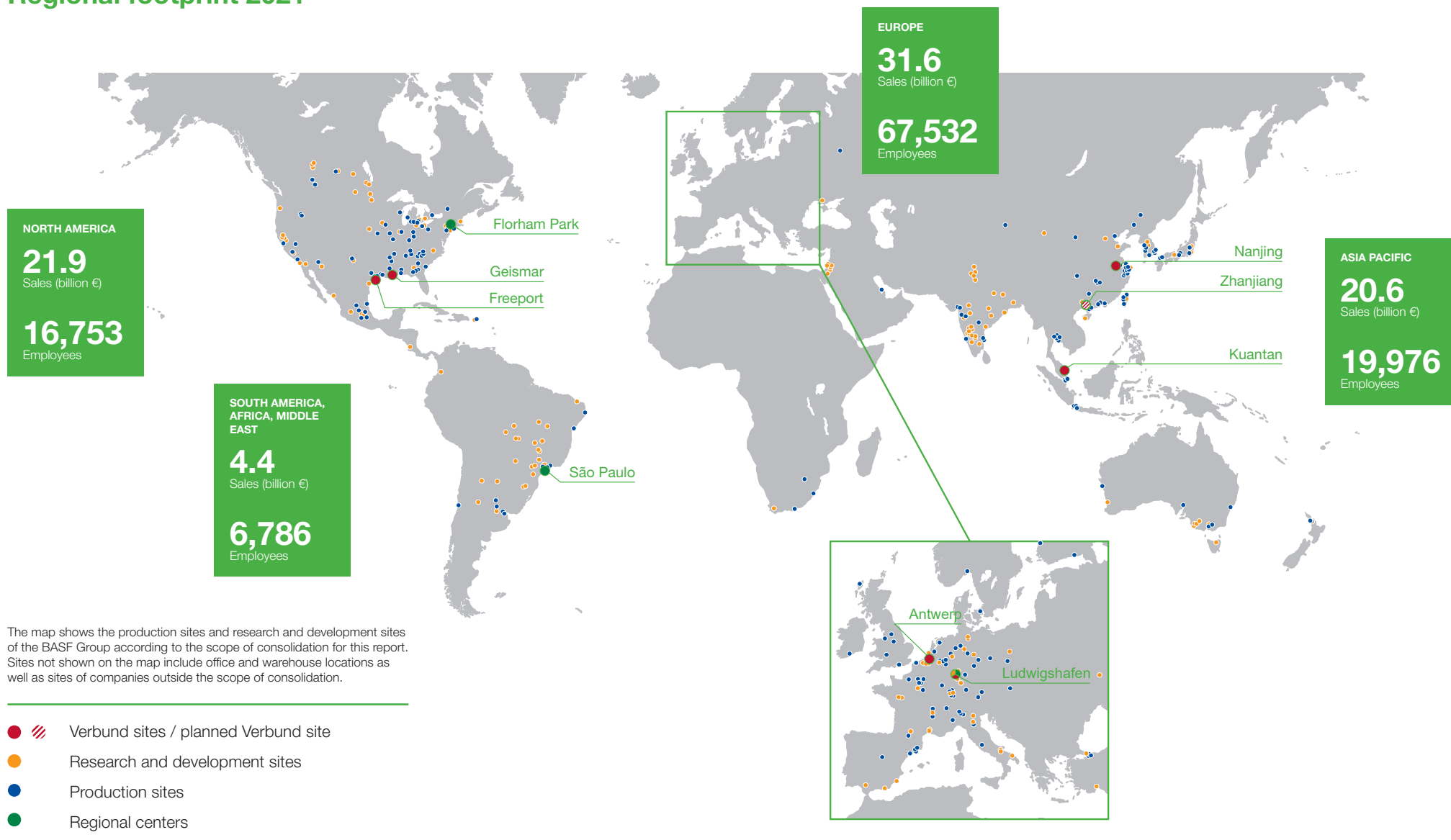
² Figures for 2018 were restated with the presentation of the construction chemicals activities as discontinued operations.

³ Figures for 2019 were restated to reflect the reclassification of income from non-integral companies accounted for using the equity method to net income from shareholdings.

⁴ BASF's ethylene value chain was reorganized 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 figure has been adjusted accordingly. Overall, the adjustments improved the BASF Group's ROCE for 2021 by 0.2 percentage points to 13.7%. For more information, see [basf.com/q12022](https://www.basf.com/q12022).

⁵ Based on year-end share price

Regional footprint 2021



The map shows the production sites and research and development sites of the BASF Group according to the scope of consolidation for this report. Sites not shown on the map include office and warehouse locations as well as sites of companies outside the scope of consolidation.

Management Board

Board of Executive Directors of BASF SE Responsibilities as of June 1, 2022



Dr. Martin Bruder Müller

Chairman of the Board of Executive Directors

61 years old, 34 years at BASF

Responsibilities:

Corporate Legal, Compliance & Insurance; Corporate Development; Corporate Communications & Government Relations; Corporate Human Resources; Corporate Investor Relations; Senior Project Net Zero Accelerator



Dr. Hans-Ulrich Engel

Vice Chairman of the Board of Executive Directors, Chief Financial Officer and Chief Digital Officer

63 years old, 34 years at BASF

Responsibilities:

Corporate Finance; Corporate Audit; Corporate Taxes & Duties; Global Business Services; Global Digital Services; Global Procurement



Saori Dubourg

50 years old, 25 years at BASF

Responsibilities:

Petrochemicals; Intermediates; Performance Materials; Monomers; Europe



Michael Heinz

58 years old, 38 years at BASF

Responsibilities:

Care Chemicals; Nutrition & Health; Agricultural Solutions; North America; South America



Dr. Markus Kamieth

51 years old, 23 years at BASF

Responsibilities:

Dispersions & Resins; Performance Chemicals; Catalysts; Coatings; Greater China; South & East Asia, ASEAN & Australia/New Zealand; Megaprojects Asia



Dr. Melanie Maas-Brunner

Chief Technology Officer, Industrial Relations Director

53 years old, 25 years at BASF

Responsibilities:

Corporate Environmental Protection, Health & Safety; European Site & Verbund Management; Global Engineering Services; Group Research; BASF New Business

Supervisory Board of BASF SE as of April 29, 2022

Shareholder representatives¹

Dr. Kurt Bock

Chairman of the Supervisory Board of BASF SE; Former Chairman of the Board of Executive Directors of BASF SE

Prof. Dr. Stefan Asenkerschbaumer

Chairman of the Supervisory Board of Robert Bosch GmbH and Managing Partner of Robert Bosch Industrietreuhand KG

Prof. Dr. Thomas Carell

Professor of Organic Chemistry at LMU Munich

Dame Alison J. Carnwath DBE

Senior Advisor Evercore Partners

Liming Chen

Chairman of IBM Greater China Group

Alessandra Genco

Chief Financial Officer of Leonardo SpA

Employee representatives

Sinischa Horvat

Vice Chairman of the Supervisory Board of BASF SE; Chairman of the BASF Works Councils Ludwigshafen Site and Europe, and of BASF's Joint Works Council

Tatjana Diether

Member of the BASF Works Councils Ludwigshafen Site and Europe

André Matta

Member of the BASF Works Councils Ludwigshafen Site and Europe

Natalie Mühlenfeld

District Manager of the Mining, Chemical and Energy Industries Union (IG BCE) for the Düsseldorf district

Michael Vassiliadis

Chairman of the Mining, Chemical and Energy Industries Union (IG BCE)

Peter Zaman

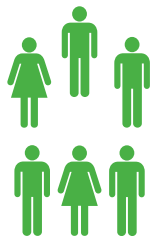
Deputy Secretary of the Works Council of BASF Antwerpen N.V.

[For further information, please refer to basf.com/share/supervisory-board](https://www.basf.com/share/supervisory-board)

¹ Vice Chair to be elected at the next Supervisory Board meeting following the Annual Shareholders' Meeting.

Two-tier management system of BASF SE

Board of Executive Directors



6 members

appointed by the Supervisory Board

Chair

appointed by the Supervisory Board



Supervisory Board



12 members

6 shareholder representatives elected by the Annual Shareholders' Meeting and 6 employee representatives

Chair

elected by the Supervisory Board

The Supervisory Board works hand in hand with the Board of Executive Directors to ensure long-term succession planning for the composition of the Board of Executive Directors. BASF aims to fill most Board positions with leaders from within the company. It is the task of the Board of Executive Directors to propose a sufficient number of suitable individuals to the Supervisory Board.

The aim is to enable the Supervisory Board to ensure a reasonable level of diversity with respect to education and professional experience, cultural background, international representation, gender and age when appointing members of the Board of Executive Directors. Irrespective of these individual criteria, a holistic approach will ultimately determine a person's suitability for appointment to the Board of Executive Directors of BASF SE.

[For more information on the competence profiles, diversity concepts and composition goals, see BASF Report 2021, page 162 onward.](#)

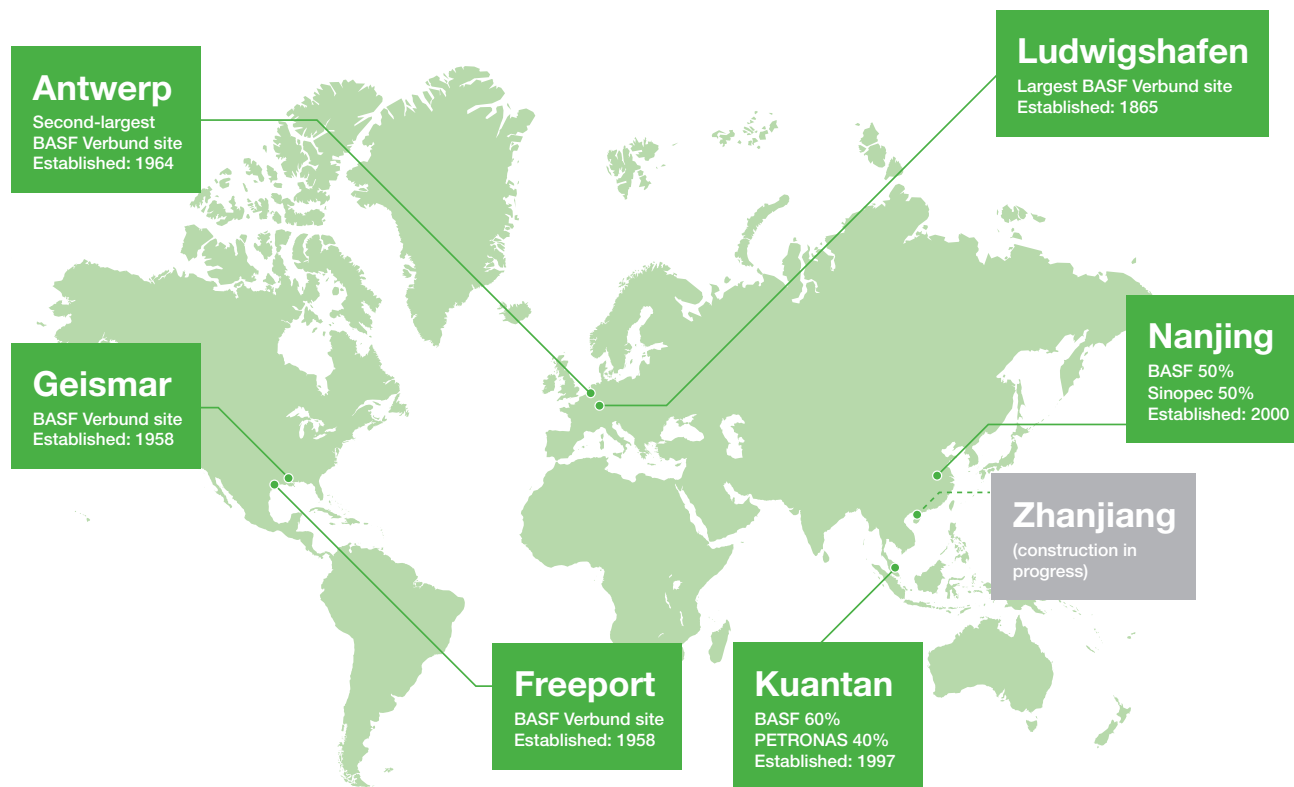
BASF Verbund

Our unique Verbund concept is one of BASF's greatest strengths. The driving principle of the Verbund concept is to add value through the efficient use of resources. At our Verbund sites, production plants, energy and material flows, logistics, and site infrastructure are all integrated.

BASF currently operates six Verbund sites worldwide: two in Europe, two in North America and two in Asia. Our Verbund site in Ludwigshafen, Germany, is the world's largest chemical complex owned by a single company that was developed as an integrated network. We are building a seventh Verbund site in Zhanjiang, in the Chinese province of Guangdong.

The Verbund system creates efficient value chains that extend from basic chemicals all the way to consumer products. In this system, chemical processes make use of energy more efficiently, achieve higher product yields and conserve resources. By-products of one process are used as starting materials for another process. We thus save on raw materials and energy, minimize emissions, cut logistics costs and realize synergies. BASF operates an additional 232 production sites worldwide, but the six Verbund sites produce more than 50% of our volumes. This is a testament to the importance and strength of the Verbund concept within BASF.

The Verbund creates opportunities to reduce emissions, waste and resource consumption. Around half of the Verbund advantages stem from wastewater, steam and electricity savings compared to BASF's non-Verbund sites as well as compared to publicly available data on industry cost averages. The remaining 50% of the savings are achieved in logistics and material handling due to our chemical integration (using pipelines instead of filling and transporting via truck/railway/ship). These benefits make the Verbund sites our most efficient sites.



Strong sustainability performance

Value chains in integrated Verbund structures can be steered efficiently to conserve resources and reduce CO₂ emissions.

Nearly 60% of BASF Group's electricity demand is met by gas and steam turbines in our highly efficient combined heat and power plants. Compared with separate methods of generating steam and electricity, we saved 15.0 million MWh of fossil fuels in 2021 and avoided 3.0 million metric tons of carbon emissions. In 2021, internally generated power in the BASF Group had a carbon footprint of around 0.24 metric tons of CO₂ per MWh of electricity and was

below the national grid factor at most BASF Group locations. As part of our carbon management, we aim to reduce the carbon footprint of purchased electricity.

The Verbund system is an important component of our energy efficiency strategy: Waste heat from one plant's production process is used as energy in other plants. In this way, the Verbund saved us around 21.4 million MWh in 2021, which translates to 4.3 million metric tons less CO₂ released into the environment. With combined power and steam generation as well as our optimized Energy Verbund, we were thus able to avoid a total of 7.3 million metric tons of carbon emissions in 2021.

Verbund effects strengthen portfolio

The Verbund goes beyond **production**. It has several additional dimensions that all contribute across the businesses to strengthen our portfolio and to create value. By managing our **value chains**, we ensure the competitive and flexible supply of key raw materials and products to all segments.

We have strong **technological competence** in production processes as well as in research, product development and our customers' applications. This know-how is available in our operating divisions and through our Group Research division.

Digitalization is an integral part of our business and we harvest the benefits from the vast amount of data generated across BASF. Using and connecting this data intelligently, we can increase the efficiency of our processes and provide many new opportunities to create additional value for our customers.

By combining the specific expertise of each business into a broad offering, we want to be the preferred supplier for our customers in the different **markets**.

Examples from our Technology Verbund

Expertise in catalysis

Developing and using chemical catalysts that vastly speed up chemical reactions has been a core competence of BASF since the first large-scale synthesis of ammonia in 1913. Today, catalysis is employed in almost every value chain at BASF. Catalysts are required to make more than 90% of our products in an efficient and sustainable way.

Production

- 7.3 million metric tons of CO₂ emissions avoided globally in 2021
- Integration enables drop-in solutions for bio-based and recycled feedstock for low-carbon products

Value Chains

- Ensure competitive supply of key raw materials and products to all segments while avoiding CO₂ emissions

BASF is the global leader in catalyst production for adsorbents, chemical processes and refinery applications. The know-how to develop, manufacture and employ catalysts for these different applications is bundled in one research platform, creating significant synergies across the company. For example, the principles by which carriers and precious metals interact to eliminate impurities in raw materials also apply to emissions catalysts that destroy compounds such as nitrous oxides in the cleanup of industrial off-gases.

In the future, due to an increasing focus on carbon emissions and waste recycling, even more robust catalysts will be needed to handle the impurities found in, for instance, bio-based raw materials and plastic waste. With our broad experience across many chemical value chains, BASF's catalyst R&D is well equipped to tackle these challenges.

Verbund



Technologies

- Leverage technological advantages and innovation across all segments
- Unique expertise in developing and integrating new, low-emission technologies

Digitalization

- Harvest the advantages offered by digitalization across BASF, for example, by calculating product carbon footprints

Markets

- Create customer relevance through size and broad portfolio

White biotechnology and fermentation technologies

Future growth in many of our markets will be driven by trends like growing consumer demand for sustainable product solutions, natural and organic ingredients and their traceability. Innovation will be the key driver here, which is why we are working on approaches beyond the existing solutions with research and development in white biotechnology and fermentation technologies.

Verbund flexibility and adaptability

Despite its complexity, the Production Verbund can respond flexibly to fluctuating demand and changing markets. The Verbund Simulator is a proprietary tool that helps us optimize the Verbund. Within the Verbund, each business unit must create value for BASF. Therefore, we apply an internal market-based transfer pricing system that avoids cross-subsidization and provides transparency as we actively manage and optimize our value chains.

Strategy

Corporate strategy

Chemistry is our passion. As an industry leader, we want to be the most attractive partner for challenges that can be solved with chemistry. That is why our customers are at the center of everything we do. We want to grow profitably and at the same time, create value for society and the environment. We help to change the world for the better with our expertise, our innovative and entrepreneurial spirit, and the power of our Verbund integration. This is our goal, embedded in our corporate purpose: We create chemistry for a sustainable future.

The world is changing at a rapid pace – more and more urgently than ever, solutions are needed for a more sustainable future. Chemistry plays a key role here. In almost all areas of life, it can help overcome pressing **global challenges** with innovative products and technologies – from climate change and using resources more sparingly to feeding the world’s population. This belief is expressed in our corporate purpose and is what motivates us day in and day out: 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 contribute to climate protection and help to prevent or recycle waste, produce healthy and affordable food, and enable climate-smart mobility.

At the same time, as an energy and resource-intensive company, we are facing what is probably the biggest **transformation** in our over 150-year history: The shift toward a carbon-neutral and circular economy and the associated landmarks such as the European Green Deal demand from us new concepts and approaches – for the way we produce, for our raw material base and for our energy supply.

Global trends provide opportunities for growth in the chemical industry











Sources: U.N., IEA, Conversio, UBS Foresight, BASF

We also see these disruptive changes as an opportunity. As the world’s largest chemical company, we want to lead the way and **actively and responsibly shape the change**. That is why we are switching our energy and raw material supplies to renewable sources. We are strengthening our Verbund structure as the basis for resource-efficient, safe and reliable production. We are developing pioneering low-carbon production processes for our products. We are accelerating our innovation processes and deepening cooperation with partners to develop high-performance products that require fewer resources and have a lower carbon footprint. We are


harnessing the many opportunities of digitalization. We are systematically aligning our portfolio with growth areas and future technologies, and are integrating sustainability into our value chains even more strongly. We support our customers with sustainable solutions on their own journey toward more sustainability. And we create a working environment in which our employees can thrive and contribute to BASF’s long-term success. This is how we live our corporate purpose.

Status of Target Achievement in 2021¹





Profitable growth

	2021 target	2021 status	SDG
Achieve a return on capital employed (ROCE) considerably above the cost of capital percentage every year	>9%	13.7% ²	 
Grow sales volumes faster than global chemical production every year	>6.1%	10.6%	 
Increase EBITDA before special items by 3%–5% per year	3%–5%	53%	 
Increase the dividend per share every year based on a strong free cash flow	>€3.30	€3.40	 

Effective climate protection

	2030 target	2021 status	SDG
Reduce our absolute CO₂ emissions³ by 25% by 2030 <small>(Development of carbon emissions compared with baseline 2018)</small>	16.4 million metric tons	20.2 million metric tons	




Sustainable product portfolio



	2025 target	2021 status	SDG
Achieve €22 billion in Accelerator sales by 2025	€22.0 billion	€24.1⁴ billion	   

Responsible procurement

	2025 target	2021 status	SDG
Cover 90% of our relevant spend with sustainability evaluations by 2025	90%	85%	 
Have 80% of our suppliers improve their sustainability performance upon re-evaluation	80%	74%	 

Resource efficiency and safe production

	2025 target	2021 status	SDG
Reduce worldwide process safety incidents per 200,000 working hours to ≤0.1 by 2025	≤0.1	0.3	 
Reduce the worldwide lost-time injury rate per 200,000 working hours to ≤0.1 by 2025	≤0.1	0.3	

	2030 target	2021 status	SDG
Introduce sustainable water management at our production sites in water stress areas and at our Verbund sites by 2030	100%	53.5%	 

Employee engagement and diversity

	2030 target	2021 status	SDG
Increase the proportion of women in leadership positions with disciplinary responsibility to 30% by 2030	30%	25.6%	
More than 80% of our employees feel that at BASF, they can thrive and perform at their best	>80%	82%⁵	

 Most important key performance indicators

¹ Targets as published in the BASF Report 2021. The objective of these targets is to steer our business into a sustainable future and, at the same time, contribute to the implementation of the United Nations' Sustainable Development Goals (SDGs).
² BASF's ethylene value chain was reorganized 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 figure has been adjusted accordingly. Overall, the adjustments improved the BASF Group's ROCE for 2021 by 0.2 percentage points to 13.7%. For more information, see [basf.com/q12022](https://www.basf.com/q12022).
³ The goal includes Scope 1 and Scope 2 emissions. Other greenhouse gases are converted into CO₂ equivalents according to the Greenhouse Gas Protocol.
⁴ We already achieved our 2025 sales target for Accelerator products in 2021. Consequently, we will update our portfolio steering target in the course of 2022.
⁵ We regularly calculate the employee engagement level. The last available survey was conducted in 2020. A new survey was started in spring 2022.

Our strategic action areas

BASF's strategic orientation is founded on a comprehensive analysis of our markets and competitors. We continuously monitor global trends and anticipate the resulting growth opportunities and risks. The following six strategic focus areas enable us to focus on our customers while strengthening our leading position in an increasingly volatile and 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 annual R&D spending of around €2.2 billion. We are expanding this position by strengthening specific research activities. We are also bringing research and development even closer together, incorporating our customers' requirements into our innovation processes even earlier and more intensively, and expanding cooperation with customers and external partners.

Sustainability

We believe that the economy, environment and society are inextricably linked. We want to create value in all three areas with our prod-

ucts, solutions and technologies. We pledged our commitment to sustainability in 1994 and since then, have systematically aligned our actions with the principles of sustainability. We want to further strengthen our position as a thought and action leader in sustainability. We see sustainability as an integral part of our strategy as well as our targets, steering processes and business models. This establishes us as a responsible and attractive partner supporting our customers, opens up new growth areas and secures the long-term success of our company. Our approach covers the entire value chain – from responsible procurement and safety as well as resource efficiency in production to sustainable solutions for our customers.

Production

Our core business is the production and processing of chemicals. Our strength here lies in the Verbund and its integrated value chains. The Verbund offers us many technological, market, production-related and digital advantages. Our comprehensive product portfolio, which ranges from basic chemicals to tailored system solutions, enables us to meet the increasingly diverse needs of our customers with a differentiated offering. This is complemented by our global presence, coupled with our many decades of experience, which

have allowed us to develop an in-depth understanding of the needs and landscapes of local markets.

Digitalization

We want to leverage the extensive growth potential of digitalization and seize the associated opportunities to the benefit of our customers. To achieve this, we promote digital skills among our employees, 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, increase the capacity, availability and efficiency of our plants. The combination of products, services and digital offerings also opens up new business models and advantages for our customers, such as in agriculture or personal care.

Portfolio

The acquisitions and divestitures made in the past few years have oriented our portfolio even more strongly toward innovation-driven growth areas. In 2021, we successfully integrated the polyamide business acquired from Solvay, further strengthening our position in engineering plastics. We closed the divestiture of our pigments business to the fine chemicals company DIC as planned in the first half of 2021. The sale of our shareholding in Solenis to Platinum Equity was also completed as planned in November 2021. We steer our six segments along our value chains. Our operating divisions drive forward our industry and customer orientation with differentiated strategies. The major growth projects for the coming years are our new Verbund site in Zhanjiang, China, and the expansion of our battery materials business.

People

Our employees are key to BASF's success. We believe it is important to have an inspiring working environment that fosters 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. 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.

Use of cash – clear focus on long-term shareholder value



Customer focus

Our customers are our number one priority and are at the heart of our strategy. We want to be their most attractive partner for challenges that can be solved with chemistry. BASF supplies products and services to around 90,000 customers¹ from almost all sectors and countries around the world. Our customer portfolio ranges from major global customers and small and medium-sized enterprises to end consumers. Our comprehensive product portfolio means that we are active in many value chains and value creation networks. We use various business strategies, which we adapt to the needs of individual industries and markets. These range from cost leadership in basic chemicals to tailored system solutions for specific customer applications.

We continue to drive forward our customer focus. We have refined our organizational structure to enable our operating divisions to flexibly address specific market requirements and differentiate themselves from the competition.

We are improving our customer relationships with a range of measures. For example, since 2019 we have been using the Net Promoter System® worldwide to record and optimize our solution orientation, product quality and delivery reliability based on direct customer feedback. We have been using the customer relationship management system Salesforce since 2020. The application helps sales employees to provide customer support and simplifies their work. Above and beyond this, we have intensified cooperation with our customers to jointly leverage innovation and growth potential. For instance, we established interdisciplinary teams in our business units to address the needs of our key customers even better and faster.

In 2021, we once again received awards from a number of highly satisfied customers.

Selected awards

- Ford: World Excellence Award
- Dulux: Supplier of the Year Award
- 3M: Supplier of the Year Award

Our customers' satisfaction is the basis for our success, which is why quality management is of vital significance for BASF. Our Quality Management System is risk-based, process-oriented and focused on customer satisfaction. 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.

BASF sales by industry 2021

Direct customers

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



The virtual car

The automotive industry is one of our most important customer sectors. In February 2021, we launched an interactive platform that showcases BASF's wide range of solutions and innovation expertise in mobility: Customers can explore over 500 application areas in a new virtual car – from high-performance plastics and coatings to automotive fluids, catalysts, cathode materials and more. Detailed information is provided on all products and solutions. The virtual car offers a selection of different powertrain technologies: combustion engine, plug-in hybrid, battery electric vehicle and fuel cell vehicle. E-mobility solutions can also be filtered by material properties such as battery efficiency, corrosion protection or thermal protection.

[Discover the virtual car at basf-vcar.com](https://www.basf-vcar.com)

¹ The number of customers refers to all external companies (sold-to parties) that had contracts with the BASF Group in the business year concerned under which sales were generated.

Innovation

Protecting our climate and making the best use of limited natural resources while supplying the fast-growing global population with food, energy and clean water are among the greatest challenges of our time. Innovations based on chemistry play a pivotal role in overcoming these. That is why we are working together with our customers on innovative processes, technologies and products for a more sustainable future.

Innovation has always been the key to BASF's success. The knowledge and skills of our highly qualified employees are 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 2021.

Our **research and development expenses** amounted to €2,216 million in 2021 (2020: €2,086 million). Research and development activities in our operating divisions, which are 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.

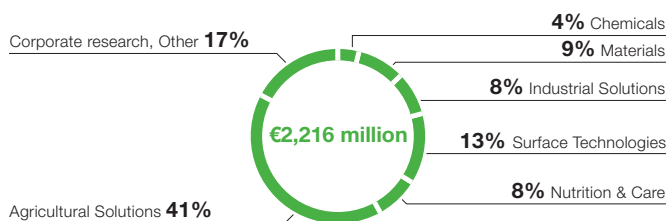
Our **innovation focus** is on developing sustainable solutions for our customers. We ensure our long-term competitiveness by helping our customers reduce their carbon footprint, use resources more efficiently, or manufacture products in a more environmentally friendly way and to recycle them.

In 2021, we generated sales of over €11 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 continue significantly increasing sales and earnings with new and improved products – especially with products that make a substantial sustainability contribution in the value chain.

We have already brought our research and development units closer together over the past few years. Effective June 2022, we have reorganized our global research activities to further strengthen our innovation performance and enable us to respond even better and faster to our customers' industry-specific requirements. Business and application-driven research units that were previously part of the three corporate research divisions have been integrated into the operating divisions, aligning them even more closely with the needs of our customers. The aim is to further shorten the time to market for new products and accelerate BASF's organic growth. Research activities that are relevant to several operating divisions are now bundled in a central research division steered from Ludwigshafen, Germany. This unit will continue to be globally organized with research centers in Europe, North America and Asia Pacific. Together with the development units in our operating divisions, it forms the core of our global Know-How Verbund.

We will 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.

Research and development expenses by segment 2021



We strengthen existing research focus areas and continually develop new key technologies that are of central significance for our operating divisions, such as polymer technologies, catalyst processes and biotechnological methods.

We promote creative and agile research approaches. We are driving forward the development of new business areas. For example, we are developing coating technologies and materials that make innovative surfaces and functions possible. Functional films can be used to reduce the frictional resistance of coatings or improve UV protection and weather resistance, for example. Our innovative solutions help our customers to achieve their sustainability goals.

[For more information on innovative coatings, see page 55](#)

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. This will enable us to offer our customers products with a lower carbon footprint in the future.

[For more information on low-carbon production processes, see page 19](#)

The number and quality of our **patents** also attest to our power of innovation and long-term competitiveness. In 2021, we filed around 820 new patents worldwide. The Patent Asset Index, a method that compares patent portfolios, once again ranked us among the leading companies in the chemical industry in 2021.

Global network

Our global network of outstanding 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, and helps us to quickly develop targeted, marketable innovations, strengthen our portfolio with creative new projects, and in this way, reach our growth targets.

Our eight academic research alliances bundle partnerships with several research groups in a region or with a specific research focus. They are complemented by cooperations with around 280 universities and research institutes as well as collaborations with a large number of companies.

 For more information on our academic research alliances, see BASF Report 2021, page 50

From the lab to real-world applications

Our aim is to quickly turn ideas into innovations for a sustainable future. To achieve this, we bring together the creativity, experience and expertise of our employees with the know-how of our partners from academia and industry.

Recycling industrial off-gases: Industrial off-gases are usually incinerated or thermally recovered. In both cases, CO₂ is emitted. To avoid this and to recycle the main components of the off-gases so they can be used in chemical production, BASF has been researching an innovative process – gas fermentation – with the U.S. startup LanzaTech since 2018. The interdisciplinary team achieved an important breakthrough in 2021: Using special bacteria, they were able to produce n-octanol from carbon monoxide and hydrogen for the first time. The molecule is an alcohol and is used in cosmetics, for example. Normally, microorganisms cannot produce n-octanol, which is toxic to them. However, using biotechnological methods, LanzaTech was able to program the organisms to produce and tol-

erate n-octanol as part of a gas fermentation process. In parallel, BASF researchers developed a process that enables the continuous separation and purification of n-octanol. Following successful implementation in the laboratory, the team is now working on further process improvements. Integrating gas fermentation technology into the BASF Verbund could contribute to a carbon-neutral circular economy in the future.

Bio-based and biodegradable ingredients: Circular economy and sustainability are also playing an increasingly important role for our customers in the detergent and cleaner industry. That is why interdisciplinary teams at BASF have been working on how to optimize cleaning performance and environmental compatibility. The focus here is on new ingredients that can be produced from renewable raw materials and biodegraded at the end of their productive life cycle. This calls for new approaches in research and development. We are developing a fundamental understanding of how biodegradation occurs under different conditions in joint projects with academic partners and closely coordinated laboratory and field research. The additional integration of new digital tools and faster screening and testing methods enables us to shorten our development times and develop high-performance, environmentally compatible ingredients – not only for cleaning purposes, but also for cosmetics and industrial applications such as agrochemicals.

Animal-free testing methods: The European Union wants to significantly improve the safety of chemical products. BASF supports this goal and has been actively working to make it a reality for many years. For example, in order to meet expanded requirements and additional testing obligations under the E.U.'s Chemicals Strategy for Sustainability in the future, we are developing innovative in vitro methods with our own laboratory team and together with partners. Among other things, they will help us to efficiently and reliably detect and evaluate potential hormonal effects of substances – even without animal testing. BASF has been researching alternative methods for many years and recently reached an important milestone: In 2021, the OECD approved the world's first toxicology testing

strategy without animal testing – a joint project between BASF and Givaudan. It can be used to reliably predict whether a substance causes allergic reactions in the skin without animal testing. We make all methods that we develop and that have regulatory approval freely available to interested companies and authorities.

Growth opportunity battery materials and recycling

BASF is the largest chemicals supplier to the transportation industry, with more than 20% of sales to this market in 2021 and leading market positions in OEM coatings, engineering plastics and mobile emissions catalysts. In battery materials, BASF focuses on high-performance cathode active materials (CAM). In this business, chemical innovation is the biggest lever to improve energy density, reliability and safety and to reduce the cost of batteries for electric vehicles. BASF's unmatched access to OEMs and their suppliers enables an early understanding of market needs, leading to product development from a well-established position in the two key CAM technologies, NCA (Nickel-Cobalt-Aluminum) and NCM (Nickel-Cobalt-Manganese).

Battery materials is a very dynamic market, as OEMs have more than 300 electric vehicle models lined up for introduction in the next three to five years. The compounded annual growth rate of the lithium-ion battery market is expected to be about 21% per year to 2030. For 2030, we anticipate annual production of more than 30 million electric vehicles. Depending on the mix of powertrains and technological progress, the market for CAM could be more than 4,200 kilotons, expected to reach a value of €100 billion. BASF has the required financial strength and is committed to driving the expansion of a global, cost-competitive asset footprint.

BASF's battery materials business unit currently generates annual sales in the triple-digit million-euro range. With the increasing amount of production scrap and used batteries, recycling will grow in importance. We aim to offer cathode materials based on recycled metals from a closed-loop solution. As the most economic and energy-efficient path with the

lowest CO₂ footprint, such closed-loop solutions will increase in importance during the next decade and will continuously grow to reduce the need for primary metal from mining operations.

BASF has contracted the required base metal raw material supply and is constructing a precursor (PCAM) plant in Harjavalta, Finland. Additionally, BASF has announced a collaboration with Eramet in Indonesia to evaluate the potential to build an HPAL (High-Pressure Acid Leaching) refinery in the country as a source of nickel and cobalt intermediates, which are critical base metal raw materials for the lithium-ion battery value chain.

In February 2020, BASF announced that Schwarzheide, Germany, would be the location for CAM production in Europe, enabling the supply of cathode material for approximately 20 GWh cell capacity per year. The Schwarzheide production plant will use an industry-leading energy mix with a low CO₂ footprint. Startup is planned for around the end of 2022.

To complement its own assets, BASF collaborates with TODA KOGYO. The partners established two companies: BASF TODA Battery Materials LLC in Japan (BASF: 66%) and BASF TODA America LLC in the United States (BASF: 100%). On August 31, 2021, BASF formed a majority-owned company (BASF: 51%) with Shanshan, a leading battery materials supplier, named BASF Shanshan Battery Materials Co., Ltd., to produce CAM and precursors in China. These entities plus the European plants in Harjavalta and Schwarzheide will make BASF the first company with capacities in all major markets, increasing its annual capacity to 160,000 metric tons by 2022 with further expansions underway. In March 2022, BASF signed an agreement to secure land for its future CAM and recycling site in Bécancour, Quebec, Canada, as part of its commitment to support North American producers in their transition to e-mobility.

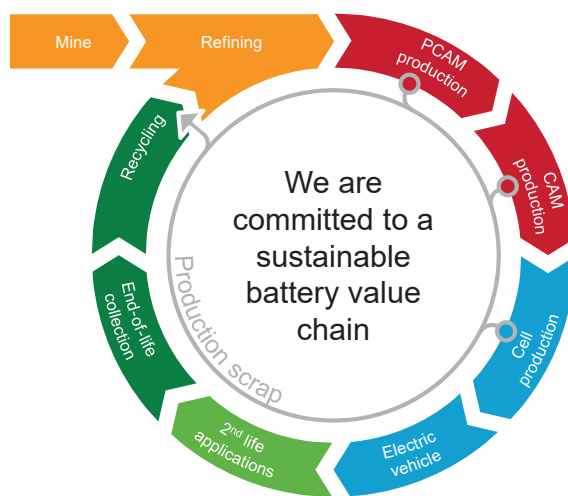
As a leading producer of battery materials, BASF has in-depth expertise in battery chemistry and process technology. We are leveraging this know-how to develop a closed-loop system for the raw materials used

to produce CAM, such as nickel, cobalt, manganese and lithium. In 2023, we intend to start up a recycling prototype plant in Schwarzheide, applying a proprietary BASF process with leading recovery rates and a low CO₂ footprint. The objective is to further increase sustainability in the value chain for batteries – from collecting end-of-life batteries and recovering mineral raw materials to using these in the production of new battery materials.

Around the world, BASF experts are working on innovative cathode materials for lithium-ion batteries to meet the growing demand for powerful, reliable and low-cost electric vehicles. These efforts will make the battery materials business a significant earnings contributor to the BASF Group, with expected sales of more than €7 billion and an expected EBITDA before special items margin (excluding metals) above 30% by 2030.

Battery materials

We have established several projects to ensure that the value chain we are building is best-in-class regarding ESG criteria



We are **partnering globally** to ensure a **resilient** and **sustainable metal supply chain** for our customers.

Our **global production presence** ensures **customer proximity** and **energy-efficient production**, minimizing the CO₂ footprint.

We are investing in **recycling** to **close the loop** and offer a **best-in-class CO₂ footprint**.

We **engage holistically** – locally, regionally, globally.

BASF has the required **financial strength** and is committed to driving the expansion of a **global cost-competitive asset footprint**.

Sustainability

We implement our corporate purpose – We create chemistry for a sustainable future – by systematically incorporating sustainability into our strategy, our business and into 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.

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. Based on our corporate strategy and the global targets derived from this, we steer the sustainability targets (reduce absolute CO₂ emissions¹ by 25% by 2030 compared with baseline 2018 and achieve €22 billion in Accelerator² sales by 2025) and have established the necessary steering mechanisms and control systems at Group level. Our global 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. We use the Sustainable Solution Steering method to manage our product portfolio.

Our products, solutions and technologies help to achieve the U.N. Sustainable Development Goals (SDGs), 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).

The Corporate Strategy & Sustainability unit in the Corporate Center integrates sustainability into core business activities and decision-making processes. The new Net Zero Accelerator project organization has reported to the Chairman of the Board of Executive Directors since January 2022. It concentrates on implementing and accelerating projects relating to low-carbon production technologies, the circular economy and renewable energies.

The Board of Executive Directors and the Supervisory Board are regularly briefed on the current status of individual sustainability topics. The Board of Executive Directors makes decisions with strategic relevance for the Group and monitors the implementation of strategic plans and target achievement. 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. A member of the Board of Executive Directors serves as chair.

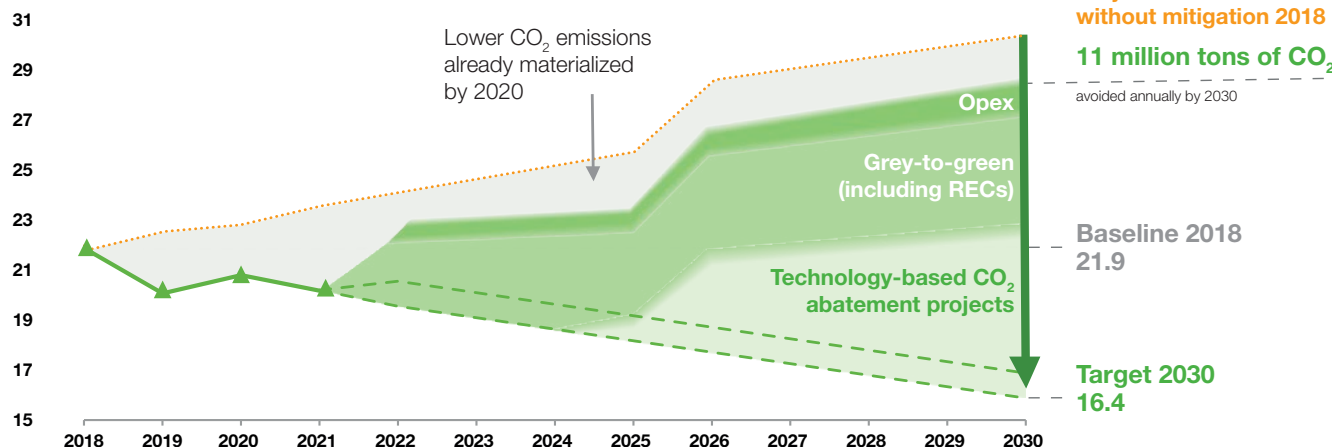
Climate protection with carbon management

BASF significantly raised its climate protection targets in 2021: We want to reduce total greenhouse gas emissions from our production sites and our energy purchases by 25% compared with 2018 – despite targeted growth and the construction of a large Verbund site in southern China. This corresponds to a reduction of 60% compared with 1990. By 2050, we aim to achieve net zero emissions from our production sites and our energy purchases. By 2025, we plan to invest up to €1 billion to achieve our climate protection targets. Additional investments of up to €3 billion are to follow by 2030.

To achieve our ambitious climate protection goals, we have adopted comprehensive carbon management with five strategic levers to reduce greenhouse gas emissions. We are increasingly meeting

Projected BASF greenhouse gas emissions

Million metric tons CO₂ equivalents



¹ The target includes Scope 1 and Scope 2 emissions. Other greenhouse gases are converted into CO₂ equivalents (CO₂e) in accordance with the Greenhouse Gas Protocol.
² Accelerator products make a substantial sustainability contribution in the value chain.

our energy needs from renewable sources (grey-to-green lever). We are relying more on energy recovery to produce steam (power-to-steam lever). We are working to further improve the energy and process efficiency of our plants (continuous opex lever). We are increasingly replacing fossil resources with bio-based raw materials (bio-based feedstocks lever). And together with partners, we are pioneering nearly carbon-free production processes, especially for emission-intensive basic chemicals (new technologies lever). We only consider external offsetting as a temporary measure if our activities do not make the desired contribution to reducing emissions.

Make-and-buy strategy for renewable electricity

A central component of reducing greenhouse gas emissions as part of our carbon management is gradually shifting our energy supply to renewable sources. This applies to both our electricity and steam supply and our production processes, where we will progressively replace fossil fuels with renewable sources. In 2021, renewables accounted for 16% of BASF Group's global power demand. By 2030, we project that 100% of our 2021 global power demand will be obtained from renewable sources.

To meet our demand, BASF is pursuing a make-and-buy strategy. This includes investing in our own renewable power assets and purchasing green power from third parties. A key purchasing criterion is the "additionality" of the energy purchased. This means that power is primarily generated by new wind and solar farms.

In 2021, BASF purchased a stake in Vattenfall's wind farm Hollandse Kust Zuid (HKZ). Once fully operational, it will be the world's largest offshore wind farm with a total installed capacity of 1.5 gigawatts. The project is expected to become fully operational in 2023. Furthermore, BASF has signed 25-year power purchase agreements (PPAs) with ENGIE and Ørsted for the supply of significant amounts of renewable electricity from wind and solar power in Europe. In the United States, BASF has entered into long-term supply contracts for wind and solar power for its Freeport and

Pasadena sites. In China, BASF has signed agreements with suppliers for the purchase of renewable power for its new Verbund site in Zhanjiang.

Number of sites partially or fully powered by emission-free electricity in 2021

88

Innovative processes for climate-smart chemistry

Most of our production processes are already highly optimized. Completely new technologies are therefore needed to reduce greenhouse gas emissions over the long term and on a large scale.

Our focus here is on the production of basic chemicals such as hydrogen. We are driving forward two alternative processes for climate-smart hydrogen production: water electrolysis and methane pyrolysis. We are currently working with Siemens Energy on initial concepts for the construction of a water electrolyzer with a capacity of 50 megawatts at the Ludwigshafen site in Germany. The methane pyrolysis process requires 80% less electricity than water electrolysis and is virtually carbon-free if renewable energy is used. We started up a pilot plant for methane pyrolysis at the Ludwigshafen site in Germany in 2021.

Another focus area is alternative heating concepts for our steam cracker furnaces. BASF has signed an agreement with SABIC and Linde to develop and pilot electrically heated steam cracker furnaces. Together, we have developed concepts to replace the fossil fuels used in the heating process with renewable energy, which has the potential to almost completely avoid CO₂ emissions. Our eFurnace project for a multi-megawatt pilot plant in Ludwigshafen is progressing as planned and is on track to start up in 2023 subject to a positive public funding decision.

In addition to new low-carbon production processes, we are also investigating the use of innovative carbon storage methods. At the

Antwerp site in Belgium, BASF plans to invest in one of the largest carbon capture and storage (CCS) projects under the North Sea together with its Antwerp@C consortium partners. The project could avoid more than one million metric tons of CO₂ emissions per year from the production of basic chemicals. A final investment decision is targeted for 2022.

Transparency through product carbon footprints

By using green power, low-carbon steam, bio-based feedstocks and highly efficient processes BASF is able to offer its customers both net-zero products as well as products with a low product carbon footprint (PCF). We can thus help our customers to transform their value chains and respond to rising demand from consumers who want to make a personal contribution to reducing carbon emissions. We have developed an in-house digital solution to calculate PCFs for around 45,000 sales products. The transparency this creates enables us to target our CO₂ reduction measures to those areas where our customers can later achieve the greatest value added from lower carbon emissions in the value chain.

In 2021, we introduced a global Supplier CO₂ Management Program to create transparency and better steer and eventually reduce upstream emissions. In a first step, we ask our suppliers to provide PCFs for our raw materials. We support them by sharing our knowledge of evaluation and calculation methods. In doing so, we are also contributing to the standardization of PCF calculation. 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 our purchasing decisions.

Verbund benefits

The Verbund system is an important component of our energy efficiency strategy: Waste heat from one plant's production process is used as energy in other plants. In this way, the Verbund saved us around 21.4 million MWh in 2021, which translates to 4.3 million metric tons less CO₂ released into the environment.

With combined power and steam generation as well as our optimized Energy Verbund, we were thus able to avoid a total of 7.3 million metric tons of carbon emissions in 2021.

CO₂ avoided by the Verbund and combined heat and power generation in 2021

7.3

million metric tons

Chemical recycling

Chemical recycling of plastic waste complements mechanical recycling and can help to reduce the amount of plastic waste that is disposed of in landfill or thermally recovered. 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. In our ChemCycling™ project, our technology partners use a pyrolysis process to produce pyrolysis oil from mixed plastic waste or used tires, which were previously not recycled. We can feed this pyrolysis oil into our Verbund as an alternative to fossil raw materials and use it to make new products that have exactly the same properties as products manufactured from fossil feedstocks.

Renewable resources

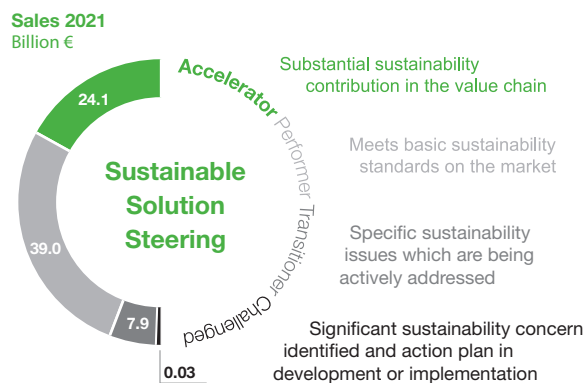
In addition to fossil resources, we employ renewable raw materials, mainly based on vegetable oils, fats, grains, sugar and wood. In 2021, we purchased around 1.3 million metric tons of renewable raw materials. The mass balance approach allows us to allocate the amount of renewable and recycled resources used to a wide variety of end products.

Palm oil, palm kernel oil and their derivatives are some of our most important renewable resources. We aim to ensure that palm-based raw materials come from certified sustainable sources and have actively supported the Roundtable on Sustainable Palm Oil (RSPO) since 2004. In 2021, we purchased nearly 243,000 metric tons of certified palm oil and palm kernel oil. BASF again reached its goal of sourcing only RSPO-certified palm oil and palm kernel oil.

Portfolio steering based on sustainability performance

A significant steering tool for the product portfolio, based on the sustainability performance of our products in the respective customer applications, is the Sustainable Solution Steering method. By the end of 2021, we had evaluated 98.7% of the relevant portfolio.¹ This refers to the BASF Group's sales from products in its strategic portfolio to third parties in the business year concerned. By the end of 2021, sustainability analyses and assessments had been conducted

€24.1 billion of BASF Group sales from Accelerator products in 2021



for more than 56,000 specific product applications, accounting for €71 billion in sales. New market requirements arise as a result of the continuous development of new product solutions in the industry or changing regulatory frameworks. This has an effect on comparative assessments, which is why we regularly reassess our product portfolio.

Transparently classifying our products on the basis of their contribution to sustainability enables us to systematically improve them. Accelerator products make a substantial sustainability contribution in the value chain. These include catalysts that reduce emissions to the environment, biodegradable mulch films for agricultural applications, and high-performance insulation materials for higher energy savings and reduced material use in building construction. We aim to make sustainability an even greater part of our innovation power and achieve €22 billion in Accelerator sales by 2025. We met this target already in 2021. Consequently, we will update our product portfolio steering target over the course of 2022.

Stakeholder engagement

We engage in worldwide initiatives with various stakeholder groups. For instance, we have been a member of the U.N. Global Compact (UNGC) since its establishment in 2000. As a recognized LEAD company, we contribute to the implementation of the Agenda 2030 and the associated goals. For example, we support the UNGC action platforms in the form of the CFO Taskforce for the SDGs and the Decent Work in Global Supply Chains action platform. BASF is also active in 13 local Global Compact networks.

Our political advocacy is conducted in accordance with transparent guidelines and our publicly stated positions. The same applies to our activities in associations. For instance, we published an Industry Associations Review in 2021 comparing the energy and climate

¹ The definition of the relevant portfolio and further information can be found in the Sustainable Solution Steering manual at basf.com/en/sustainable-solution-steering

protection positions of BASF and the most important associations of which we are a member, with explanations on our approach.

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

Responsibility for human rights

We stipulate binding rules for our employees with standards that apply throughout the BASF 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 also established a Human Rights Advisory Council (HRAC) in 2020. It is an advisory body comprising external human rights specialists and internal experts. This helps us to critically reflect on our positions and address potential for improvement.

See basf.com/humanrights for more information

Biodiversity

As a chemical company, we depend on ecosystem services like the availability of renewable resources and air, water and soil quality, while also influencing them. Protecting biodiversity is a key element of our commitment to sustainability. We use impact assessments to ensure the strategic alignment of our biodiversity measures, and we are committed to preserving biodiversity along the entire value chain via strategic partnerships.

Some of the business activities of our raw materials suppliers involve land uses that can influence biodiversity. We have laid down our expectations with regard to environmental, labor and social standards in the supply chain in the Supplier Code of Conduct.

For more information on our Supplier Code of Conduct, see basf.com/suppliers

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 the biodiversity loss driver of pollution.

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.

For more information on product stewardship for crop protection products and seeds, see [BASF Report 2021, page 124](#)

BASF participated in the "Forests" assessment conducted by the international nonprofit organization CDP for the second time in 2021 and achieved a score of A-, again giving us Leadership status.

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. However, there are no standards for measuring and reporting on companies' overall impact that cover economic, environmental and social aspects of business activities along the value chain. This is why we developed the Value to Society method in 2013 together with external experts.

Overall, the Value to Society method helps us to continually monitor our progress. It complements existing concepts for assessing risks and business opportunities by providing a macro perspective and enables us to derive the necessary business steps. The results illustrate the positive contributions and negative effects, both at BASF and in our value chains. Positive factors include taxes paid, wages, social benefits, employee training and net income.¹ Negative contributions include environmental impacts such as greenhouse gas emissions, land use and emissions to air, soil and water, as well as health and safety incidents.

We are a founding member of the value balancing alliance e.V. (VBA) and have contributed our knowledge and experience to this cross-industry initiative. We support the development of an accounting and reporting standard that makes the contribution of companies to society transparent and comparable. The aim is to present the financial, ecological, and social impacts of business activities on the basis of a standardized framework. The VBA is supported by major auditing firms, the Organisation for Economic Co-operation and Development (OECD), leading universities and other partners. Together with the VBA and other partners, we supported the establishment of the International Sustainability Standard Board (ISSB) and are part of the G7 Impact Taskforce. Through our Corporate Finance unit, we represent Business-Europe as a member of the Sustainability Reporting Board of the European Financial Reporting Advisory Group (EFRAG).

For more information on this method and the results of Value to Society, see basf.com/en/value-to-society
For more information on our sustainability tools, see basf.com/en/measurement-methods
For more information on value balancing alliance e.V., see value-balancing.com

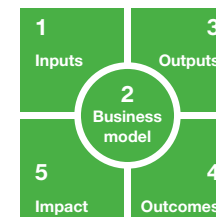
¹ The net income of BASF's production presented in the Value to Society is calculated using the BASF Group's net income, adjusted for the interest result, the other financial result and noncontrolling interests.

How We Create Value

The following overview provides examples of how we create value for our stakeholders. It is modeled on the framework of the International Integrated Reporting Council (IIRC).



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



Inputs

Financial	Innovation	Operations	Environment	Employees	Partnerships
Our aim is to ensure solvency, 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.
€87.4 billion Total assets	~10,000 R&D employees	€3.4 billion Capex	1.3 million metric tons Renewable raw materials	111,047 Employees around the world	~280 Research collaborations
48.2% Equity ratio	€2.2 billion R&D expenses	~60 million MWh Electricity and steam demand	1,695 million m ³ Total water usage	€11.1 billion Personnel expenses	>70,000 Suppliers



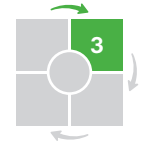
Business model

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. Sustainability and innovation is at the center of everything we do and a driver for growth and value. Safety is always our number one priority. BASF's Verbund structure is the backbone of our efficient and reliable production. Our six segments are aligned with value chains and address customer needs with differentiated solutions and business strategies. We have a global, customer-focused presence. Effective corporate governance ensures responsible conduct. We value our stakeholders and treat them with respect.



Outputs

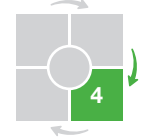
Financial	Innovation	Operations	Environment	Employees	Partnerships
€78.6 billion Sales	~820 New patents worldwide	~45,000 Sales products	47.0% Share of our waste recycled or thermally recovered	25.6% Women in leadership positions	787 Suppliers screened through Together for Sustainability
€7.8 billion EBIT before special items	€24.1 billion Accelerator sales	7.3 million metric tons CO ₂ avoided by the Verbund and combined heat and power generation	78.5% Water demand recirculated	82% Engagement index according to 2020 employee survey	77 Internal audits on our compliance standards



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

Outcomes¹

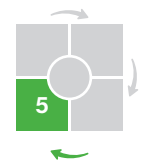
Economic	Environmental	Social
<p>We make positive contributions by</p> <ul style="list-style-type: none"> Driving forward growth, progress and value creation Strengthening our customers' competitiveness and innovative strength Accelerating the digital transformation of the industry Offering our investors an attractive dividend yield <p>Potential negative impacts</p> <ul style="list-style-type: none"> Weaker growth stimulus due to the coronavirus pandemic, the ongoing trade conflict between the United States and China, and an escalation of geopolitical conflicts A weaker share performance <p>Our countermeasures</p> <ul style="list-style-type: none"> Disciplined implementation of our corporate strategy Active portfolio management Systematic cost 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-friendly 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 Lower demand for employees in some areas <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 program



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 page 21 and [basf.com/en/value-to-society](https://www.basf.com/en/value-to-society))



¹ The outcomes category shows examples of positive contributions as well as negative impacts and the measures we take to mitigate them.

Portfolio

In addition to innovations, investments make a decisive contribution toward achieving our ambitious growth and climate protection goals. We use targeted acquisitions to supplement our organic growth. Our focus is on innovation-driven growth areas and sustainable technologies.

With a world market share of over 45%, China is already the largest chemical market and will drive growth in global chemical production to an even greater extent in the future. We expect China's share to increase to over 50% by 2030. To further strengthen our position in Asia, we plan to build a new integrated Verbund site in Zhanjiang in the southern Chinese province of Guangdong. Construction of the first plants started in 2020. They are scheduled for startup in 2022. We will also expand the Verbund site we operate together with Sinopec in Nanjing, China, by 2023.

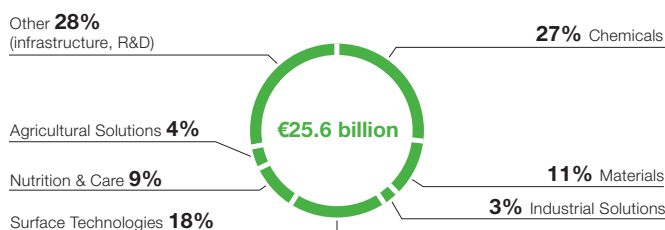
 For more information on the planned Verbund site in Zhanjiang, see page 26.

In addition, we are refining our portfolio through acquisitions that promise above-average profitable growth as part of the BASF Verbund to help reach a relevant market position. A key consideration is that these are innovation-driven or offer a technological differentiation, and make new, sustainable business models possible. Investments and acquisitions alike are prepared by interdisciplinary teams and assessed using various criteria. In this way, we ensure that economic, environmental and social concerns are included in strategic decision-making.

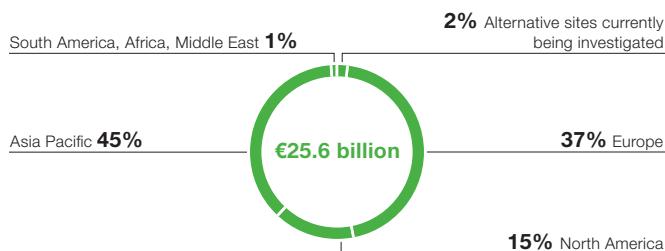
Investments

Investments in property, plant and equipment amounted to €4,078 million in 2021 (2020: €3,516 million). Capital expenditures (capex)¹ accounted for €3,363 million of this amount (2020: €2,878 million). Our investments in 2021 focused on the Chemicals, Materials, Surface Technologies and Nutrition & Care segments.

Capex by segment 2022–2026



Capex by region 2022–2026



Capex: selected projects

Location	Project
Antwerp, Belgium	Capacity expansion: integrated ethylene oxide complex Gradual capacity expansion: alkoxyates
Chalampé, France	Construction: production plant for hexamethylenediamine
Geismar, Louisiana	Capacity expansion: MDI plant
Harjavalta, Finland, and Schwarzheide, Germany	Investment: battery materials
Zhanjiang, China	Planned construction: integrated Verbund site

We are planning capex of around €4.6 billion for the BASF Group in 2022. For the period from 2022 to 2026, we have planned capex totaling €25.6 billion worldwide. The investment volume in the next

five years will thus be above that of the planning period 2021 to 2025 (€22.9 billion). Focus areas will be our investment project in Zhanjiang, China, to expand our businesses in Asia, as well as investments in battery materials.

Acquisitions

On August 31, 2021, BASF and Shanshan announced the formation of BASF Shanshan Battery Materials Co., Ltd. The newly formed entity is majority-owned by BASF (BASF 51%; Shanshan 49%). It has four sites in Hunan and Ningxia, China, with more than 1,600 employees. BASF Shanshan Battery Materials Co., Ltd. will focus primarily on the rapidly growing electric vehicle (EV) market while also serving global consumer electronic and energy storage market segments. The business is a part of the Catalysts division.

We completed the purchase of 49.5% of Vattenfall's Hollandse Kust Zuid (HKZ) wind farm on September 1, 2021. The purchase price was €0.3 billion. Wind farm construction began in July 2021. Once fully operational in 2023, the wind farm will be the largest commercial offshore wind farm in the world. This wind farm does not receive any subsidies for the power produced. On April 12, 2022, BASF and Allianz Capital Partners (on behalf of Allianz Insurance Companies) closed the purchase of 25.2% of the HKZ wind farm by Allianz Capital Partners. BASF will receive most of the power produced by its originally acquired share of 49.5% of HKZ under a long-term fixed-price corporate power purchasing agreement.

Divestitures

On May 31, 2021, BASF completed the sale of its production site in Kankakee, Illinois, to a subsidiary of One Rock Capital Partners, LLC. The agreement also includes the vegetable-oil-based sterols and natural vitamin E business as well as the anionic surfactants and esters produced at the Kankakee site. The purchase price was €177 million. The transaction affected the Nutrition & Health and Care Chemicals divisions.

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

On June 30, 2021, we closed the divestiture of our global pigments business to the Japanese fine chemical company DIC, Tokyo, Japan. The business transfer agreement, which affected around 2,500 employees, was signed on August 29, 2019. The purchase price on a cash and debt-free basis was €1.15 billion. The Dispersions & Pigments division was renamed Dispersions & Resins following the transaction closing.

On November 9, 2021, BASF and Clayton, Dubilier & Rice sold their shares in Solenis to Platinum Equity, a private equity company based in Beverly Hills, California. With over 5,200 employees, Solenis serves customers in water-intensive industries by helping them solve complex water treatment and process improvement challenges. BASF held a 49% share in Solenis after transferring its paper and water chemicals business to the company in February 2019. This was reported as a non-integral investment accounted for using the equity method. The remaining 51% of the shares were held by funds managed by Clayton, Dubilier & Rice, and by Solenis management. The purchase price attributable to BASF was €1.1 billion.

On November 30, 2021, we completed the sale of the precision microchemicals business to Entegris. The transaction included fixed assets and inventories. The purchase price amounted to \$90 million. The precision microchemicals business was part of the Surface Treatment business unit of BASF's Coatings division, operating under the Chemetall brand.

Agreed transactions

On November 18, 2021, BASF and KaMin LLC. / CADAM S.A. (KaMin) signed an agreement to sell BASF's kaolin minerals business to KaMin, a global performance minerals company headquartered in Macon, Georgia. Currently, the kaolin minerals business is part of BASF's Performance Chemicals division and has approximately 440 employees in North America, Europe and Asia. The divestiture comprises 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 are not part of the divestiture. Pending approval by the relevant authorities, closing of the transaction is expected in the second half of 2022.

On December 28, 2021, BASF reached an agreement to divest its production site in Quincy, Florida, and the associated attapulgitic

business to Clariant for a purchase price of \$60 million. The Quincy facility has around 75 employees and manufactures clay-based mineral products used in a variety of industrial applications. The transaction affects the Dispersions & Resins division and is expected to close in the summer of 2022, subject to the approval of the relevant antitrust authorities.

Strategic acquisition criteria

We want to acquire businesses which

- create more value as part of BASF's Verbund
- help achieve relevant market positions
- drive innovation or technological differentiation
- enable new and sustainable business models

Financial acquisition criteria

We want to acquire businesses which

- provide a return on capital employed above the WACC after full integration into BASF Group
- are EPS accretive by year three at the latest
- contribute to growth of EBITDA before special items

Selected, closed transactions 2010 – May 2022

Acquisitions

- Functional crop care
- Personal care and food ingredients
- Omega-3 fatty acids
- Enzymes
- Battery materials
- Specialty plastics
- Refinish coatings
- Surface treatment
- Seeds and crop protection
- Polyamide business

Divestitures

- Styrenics
- Fertilizers
- Natural gas trading and storage
- Custom synthesis business
- Textile chemicals
- Polyolefin catalysts
- Industrial coatings
- Leather chemicals
- Water and paper chemicals
- Oil & gas
- Construction chemicals
- Pigments business

~€9.5 billion sales
in emerging and innovation-driven businesses

~€29.7 billion sales
in businesses with decreased differentiation potential

New Verbund site in Zhanjiang

In recent years, market growth in China has been driven by increased domestic consumption, higher standards of living as well as more local value creation. With a world market share of over 45%, China is the largest chemical market and drives the growth of global chemical production. BASF is very well prepared to capture future growth in China. We have built an extensive network throughout the country. The following sites are the backbone of our activities in the region:

- Shanghai is home to our Greater China headquarters and an Innovation Campus as well as the Caojing production site.
- Nanjing is the location of our Verbund site in a joint venture with Sinopec as well as a wholly owned site.
- In Chongqing, we operate a wholly owned MDI production complex.

Greater China is currently BASF's second-largest market after the United States. At the end of December 2021, BASF had 11,070 employees in Greater China and 26 wholly owned production sites. In 2021, BASF posted sales of approximately €12 billion to customers in Greater China.

To continue to participate in the growth in Asia, BASF launched its smart Verbund project in Zhanjiang in the southern Chinese province of Guangdong in 2019. Subject to currency effects and planning uncertainties, we expect an investment in Zhanjiang of around €8 billion to €10 billion until 2030. The implementation will happen in phases. The project will include a wholly owned steam cracker with an industrial cluster that will ensure the highly efficient use of resources in production, logistics and infrastructure. Construction of the first plants started in 2020. They will produce engineering plastics and thermoplastic polyurethane (TPU) to serve the increasing needs of various growth industries in the southern China market and



Construction in progress at BASF's new Verbund site in Zhanjiang

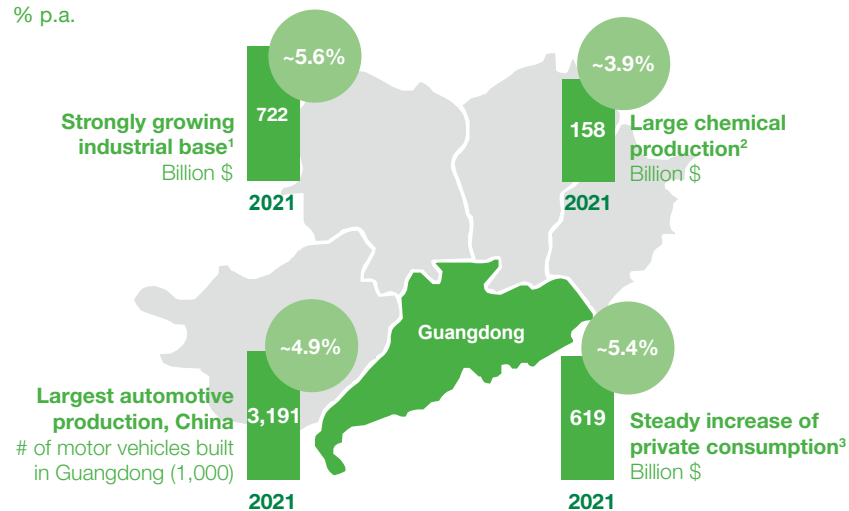
throughout Asia. The startup of the first plant is expected for 2022 and the upstream plants are expected to begin operations around 2025.

With around 126 million residents, Guangdong is the most populous province in China. The GDP growth of around 5% to 6% per year in Guangdong is driven by industrial investments of important BASF customer industries such as transportation, consumer goods, home and personal care. This large and growing market is locally undersupplied in terms of its demand for chemicals. Zhanjiang has a deep-water seaport with easy access to shipments of raw materials and finished goods to and from other ports in China, Asia and other regions. It also offers the shortest sea routes between mainland China and Southeast Asia. The government of Guangdong province is committed to providing this area with world-class logistics infrastructure. It is also being developed as a key hub for new-energy vehicles, including battery-powered vehicles.

BASF is committed to building the Zhanjiang Verbund site as a model for sustainable production. We aim to power the site with 100% renewable energy by 2025. As BASF's first implementation of a fully digital smart Verbund concept in a large-scale project globally, the site will be built on the basis of cutting-edge technologies that maximize resource and energy efficiency and reduce environmental impact. Circular economy concepts will be incorporated into the new Verbund site to support customers in the region with sustainably produced solutions.

Guangdong is home to key customers from fast-growing industries

CAGR 2015–2021
% p.a.



Market characteristics

- Over 126.2 million residents in Guangdong province (2020)⁴
- GDP Guangdong (2021): ~\$1.9 trillion (exceeding South Korea)
- GDP growth from 2021–2036: 5–6% p.a.
- Key customer industries: transportation, consumer goods, home and personal care, electronics
- Chemical products are generally undersupplied from local production

1 Real secondary industry output, 2015-based. Guangdong Bureau of Statistics
 2 Real chemical gross output, 2015-based, inferred by gross output/value added ratio for China
 3 Real private consumption, 2015-based. National Bureau of Statistics with IHS forecast
 4 Guangdong Statistical Yearbook 2021

People

Our employees are key to the successful implementation of BASF's strategy. We want to attract and retain talented people for our company and support them in their development. To do so, we 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.

Strategy

We are convinced of the value of excellent employees, leaders and working conditions, and strive to give our employees the tools and skills necessary to be able to offer our customers products and services with an even greater level of differentiation and customization. Our corporate strategy promotes a working atmosphere based on mutual trust, in which employees are given the space to optimally develop their individual skills and potential. This positions us to meet the challenges of an increasingly rapidly changing environment, demographic change and the digital workplace. In everything we do, we are committed to complying with internationally recognized labor and social standards. We want to further strengthen our innovative power with attractive working conditions and through the inclusion of diversity. Lifelong learning and individual employee development lay the foundation for this.

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. 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 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. We have made important progress toward this target. In the BASF Group, the global proportion of female leaders with disciplinary responsibility was 25.6% at the end of 2021 (2020: 24.3%).

BASF can rely on the engagement of its employees. Global employee surveys and pulse checks are established feedback tools in the BASF Group, and are used to actively involve employees in shaping their working environment. As part of the BASF strategy, we 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. The most recent survey from 2020 revealed an engagement index of 82% (2019: 79%).

We act responsibly toward our employees. Part of this is our voluntary commitment to respecting international labor and social standards, which we have embedded in our global Code of Conduct. 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). BASF is committed to complying with these standards worldwide.

Number of employees

As of December 31, 2021, the number of employees increased to 111,047 employees compared with 110,302 employees as of December 31, 2020. The rise was primarily due to staff increases in Asia Pacific, especially in connection with the formation of BASF Shanshan Battery Materials Co., Ltd., as well as our new Verbund site in Zhanjiang, China. The divestiture of the pigments business which affected around 2,500 employees, had an offsetting impact.

We employed 3,028 apprentices¹ (2020: 3,120). 2,329 employees were on temporary contracts.

BASF Group employees by region

	December 31, 2021	%
Europe	67,532	60.8
of which Germany	51,026	45.9
Asia Pacific	19,976	18.0
North America	16,753	15.1
South America, Africa, Middle East	6,786	6.1
Total	111,047	100.0

The BASF Group hired 10,293 new employees in 2021. The percentage of employees who resigned during their first three years of employment – the early turnover rate – was 1.5% worldwide in 2021. This turnover rate was 0.6% in Europe, 2.4% in North America, 3.4% in Asia Pacific and 2.5% in South America, Africa, Middle East. Our early turnover rate is therefore at a desirably low level.

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 so that they contribute to the company's long-term success. 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 global and local levels.

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

We want our employees to contribute to the company’s long-term 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.

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.

BASF Group personnel expenses

Million €

	2021	2020	+/-
Wages and salaries	8,847	8,416	+5.1%
Social security contributions and assistance expenses	1,519	1,424	+6.7%
Pension expenses	732	736	-0.5%
Total personnel expenses	11,097	10,576	+4.9%

Compliance Program and Code of Conduct

BASF’s Compliance Program is based on our corporate values and our voluntary commitments, as well as international standards. It describes our commitment to responsible conduct and expectations around how all BASF employees interact with business partners, officials, coworkers and the community.

At the core of our Compliance Program is the global, standardized Code of Conduct. All employees and managers are obligated to adhere to its guidelines, which cover topics ranging from corruption and antitrust laws to human rights, labor and social standards, conflicts of interest and trade control, and protection of data privacy.

The structure of BASF’s Code of Conduct

<p>We Care</p> <ul style="list-style-type: none"> - Our Code of Conduct - How We Make Decisions - We Always Speak Up - We Lead Integrity 	<p>We Earn Trust</p> <ul style="list-style-type: none"> - Anti-Corruption - Trade Control - Anti-Money Laundering 	<p>We Play Fair</p> <ul style="list-style-type: none"> - Antitrust Laws - Gifts and Entertainment - Conflicts of Interest 	<p>We Respect</p> <ul style="list-style-type: none"> - Human Rights, Labor and Social Standards - Environmental Protection, Health and Safety 	<p>We Protect</p> <ul style="list-style-type: none"> - Sensitive Company Information - Personal Data - Digital Responsibility - Company Property - Accurate Books and Records
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The revised 2020 version also offers our employees user-friendly features such as case studies, FAQs and additional references. The corresponding internal online platform and app are available to employees worldwide, providing them continuously with up-to-date content such as videos and links to other specialist units and guidelines as well as direct contact to subject specialists.

Abiding by compliance standards is the foundation of responsible leadership. This has also been embedded in our values. We are convinced that compliance with these standards will play a key role in securing our company’s long-term success. Our efforts are principally aimed at preventing violations from the outset.

We perform a systematic risk assessment to identify the risk of compliance violations, including corruption risks. These are conducted at divisional, regional and country levels, with an additional focus on Group companies in 2021. The regular compliance audits performed by the Corporate Audit department are another source of information for the systematic identification of risks. These risks are documented in the relevant risk or audit report. The same applies to specific risk minimization measures as well as the time frame for their implementation.

One key element in the prevention of compliance violations is compulsory training and workshops held as classroom or online courses. All employees are required within a prescribed time frame to take part in basic compliance training, refresher courses and special tutorials dealing with, for example, antitrust legislation, taxes or trade control regulations. Newly appointed senior executives also receive special training on leading with integrity. Course materials and formats are constantly updated, taking into account the specific risks of individual target groups and business areas. In total, more than 53,000 participants worldwide received over 79,000 hours of compliance training in 2021.

 For more information on the BASF Code of Conduct, see basf.com/code_of_conduct

Code of Conduct
is the core of our Compliance Program

More than 53,000
participants in compliance training

77 internal audits
conducted on adherence to our compliance standards

¹ In calculating 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 ROCE (in the first 12 months after closing) therefore only occurs in cases of exceptionally high special items resulting from acquisitions and divestitures.

2

Segments

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Segments

Markets and consumer behavior are moving faster than ever, presenting our customers from a variety of industries and regions with a wide range of challenges. These include managing limited natural resources amid rising demand and the trend toward sustainable products. Our segments' business models help to solve these challenges and show how we implement our corporate strategy in practical terms.

The **Chemicals** segment is at the heart of the Verbund. It reliably supplies BASF's other segments with chemicals to produce higher value-added products. It also markets high-quality basic chemicals and intermediates to customers in downstream industries. In this way, the Chemicals segment makes a significant contribution to BASF's organic growth.

We create value through process and product innovation and invest in research and development to implement new, sustainable technologies and make our existing technologies even more efficient. Technological leadership, operational excellence and a clear focus on individual value chains are among our most important competitive advantages. We concentrate on the critical success factors of the traditional chemicals business: leveraging economies of scale and the advantages of our Verbund, high asset reliability, continuous optimization of access to raw materials, lean and energy efficient processes, and reliable, cost-effective logistics. We continuously improve 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.

The **Materials** segment 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 from our competitors with our systems-oriented application expertise and industry knowledge, and creating maximum value in our isocyanate and polyamide value chains. Our advanced material simulation capabilities are a unique selling proposition in the industry and enable us to operate close to our customers.

Additional differentiators are our products that contribute to the circular economy and our more sustainable production processes. BASF is active in substantial parts of plastic value chains, from monomers to polymers and their formulated specialties. Combined with our specific technology knowledge, this offers us the unique ability to shape and close cycles.

Tailor-made service and product offerings enable us to continuously expand the range of applications in our portfolio. We operate close to our customers with our global production network

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 and invest in the creation of innovations with the aim of enabling more efficient resource use. This is why we develop products and processes with enhanced sustainability, for example, in polymer dispersions, resins and plastic additives, and enable 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 good value. We work on new solutions together with our

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	Improved and new 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

customers and strive for long-term partnerships that create profitable growth opportunities for both parties. To achieve this, we draw on our innovative strength and our many years of experience and extensive industry expertise. Through our in-depth application knowledge and technological innovations, we strengthen customer relationships in key industries such as the automotive, plastics and electronics industries.

In the **Surface Technologies** segment, our focus is on the protection, modification and development of surfaces. We develop innovative products and technologies in close collaboration with our customers from the catalysts, coatings and battery materials sectors. 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. Together with our customers, we are developing customized, more sustainable solutions in these growth areas for battery materials, emission control, recycling and functional coatings. Our specialties and system solutions in these areas enable customers to stand out from their competition.

The above trends mean that the automotive industry is currently undergoing a fundamental transformation. As one of the largest chemicals suppliers to this industry, we will, as announced in December 2021, further strengthen our focus on battery materials and recycling and pursue an ambitious growth plan. We will also establish a new entity (BASF Automotive Catalysts and Recycling) 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 will prepare the business for the upcoming changes in the

internal combustion engine market and allow for future strategic options.

In the **Nutrition & Care** segment, we strive to expand our position as a leading provider of nutrition and care ingredients for consumer applications. We aim to enhance our capabilities in areas such as biotechnology and broaden our portfolio with bio-based and biodegradable products. In this connection, BASF has entered into partnerships to further strengthen its position in the bio-based surfactants and actives market.

Our enzymes business enables us to pursue a targeted and efficient marketing strategy and expand our portfolio for natural and biotechnological products. Furthermore, we are investing in natural and biological substances. BASF's biopharma business supports the biopharmaceutical industry by supplying the raw materials used to produce biological drugs.

In addition, acquisitions complement our focus on emerging markets, 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.

In the **Agricultural Solutions** segment, we believe that the way forward for agriculture is to find the right balance and create value for the environment, society and business. While the demand for food, feed, fiber and energy is growing, natural resources are limited. Agriculture is a key enabler in providing 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 committed to 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 – yield that is produced in ways that are recognized as valuable by society, are kind to the planet and enable farmers to 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, which we link intelligently. This enables us to offer farmers solutions tailored to their region and crop systems to safeguard yields, mitigate risks and fulfill societal requirements.

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.

Divisions

Petrochemicals

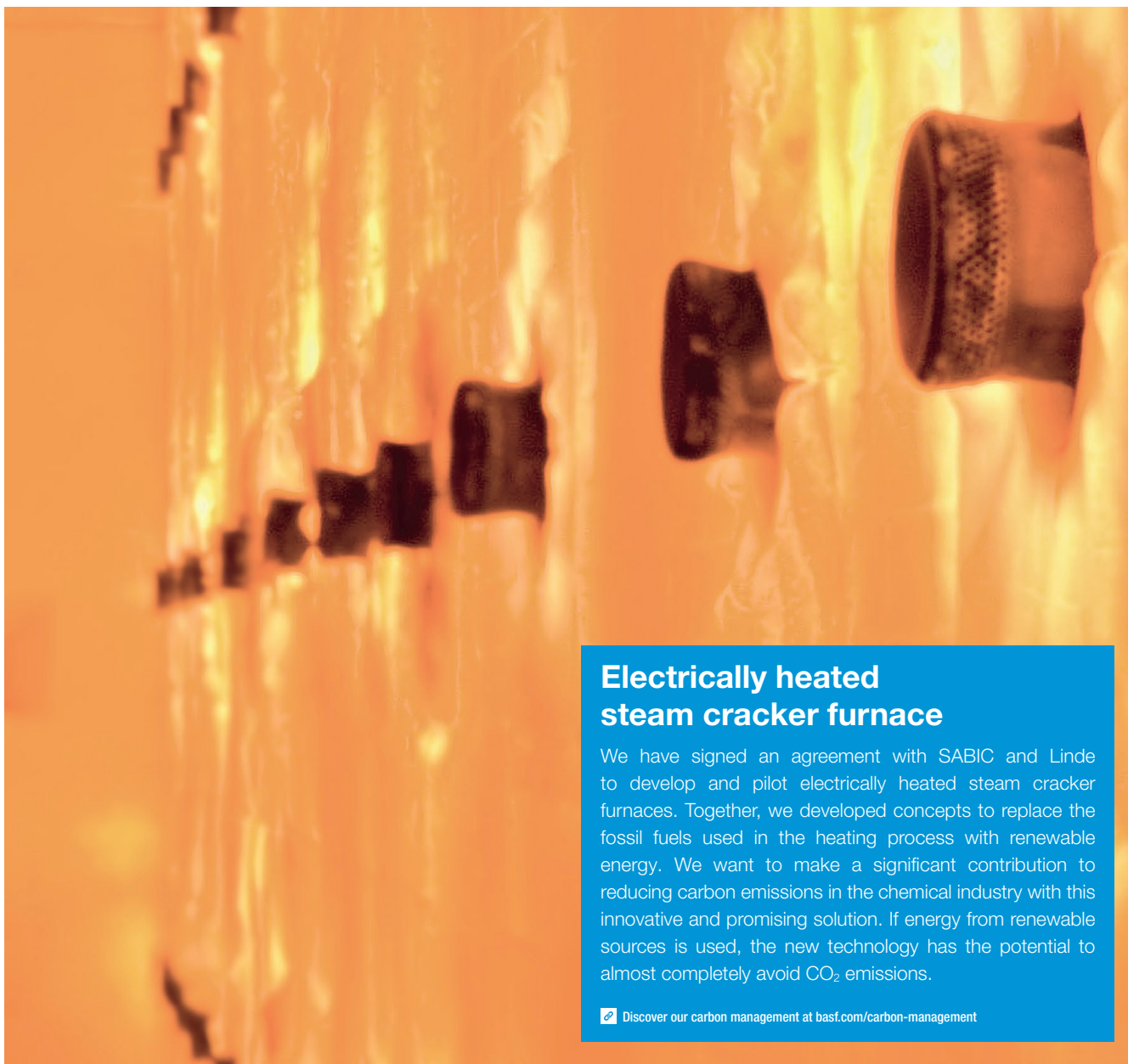
Broad portfolio of high-quality basic chemicals and specialties, tailored to the needs of internal and external customers, which serve as starting materials for products such as dispersions, paints, coatings, plastics, insulating materials and hygiene products

 page 34

Intermediates

Comprehensive portfolio of intermediates and specialties, which are used as precursors for products such as coatings, plastics, textile fibers, pharmaceuticals and crop protection products

 page 36



Electrically heated steam cracker furnace

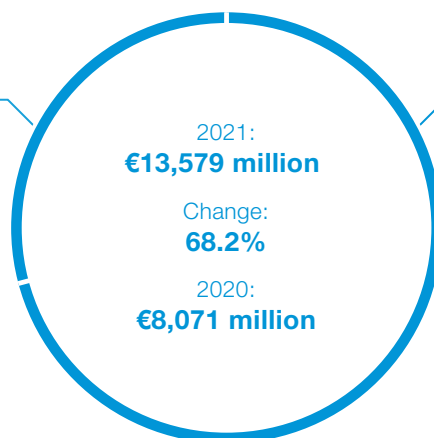
We have signed an agreement with SABIC and Linde to develop and pilot electrically heated steam cracker furnaces. Together, we developed concepts to replace the fossil fuels used in the heating process with renewable energy. We want to make a significant contribution to reducing carbon emissions in the chemical industry with this innovative and promising solution. If energy from renewable sources is used, the new technology has the potential to almost completely avoid CO₂ emissions.

 Discover our carbon management at basf.com/carbon-management

Segment Chemicals

Sales

Intermediates €3,904 million
Change: **47.6%**
Share of sales: **29%**



Petrochemicals €9,674 million
Change: **78.3%**
Share of sales: **71%**

Segment data

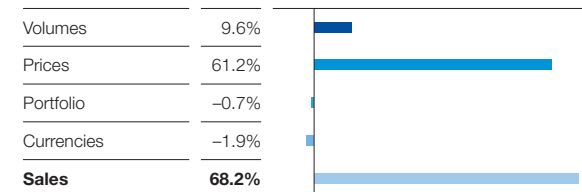
Million €

	2021 ¹	2020	2019
Sales to third parties	13,579	8,071	9,532
Share of total BASF sales	17	14	16
of which Petrochemicals	9,674	5,426	6,670
Intermediates	3,904	2,645	2,862
Income from operations before depreciation and amortization (EBITDA) before special items	3,842	1,305	1,574
Income from operations before depreciation and amortization (EBITDA)	3,882	1,237	1,545
EBITDA margin	28.6	15.3	16.2
Income from operations (EBIT) before special items	3,092	445	791
EBIT before special items margin	22.8	5.5	8.3
Income from operations (EBIT)	3,115	-192	622
EBIT margin	22.9	-2.4	6.5
Return on capital employed (ROCE)	33.9	-2.2	6.8

¹ BASF's ethylene value chain was reorganized 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 2021 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. For more information, see: [basf.com/q12022](https://www.basf.com/q12022)

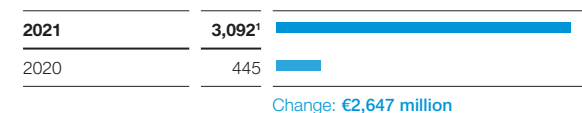
Factors influencing sales

2021 versus 2020



EBIT before special items

Million €



Petrochemicals

The Petrochemicals division is the cornerstone of BASF's petrochemical-based value chains throughout the regions. The division manufactures and markets a broad portfolio of high-quality basic chemicals and tailored specialties for internal and external customers. To contribute to BASF's net zero CO₂ emissions goal, we offer some of our portfolio based on circular feedstock. For this purpose, either renewable or chemically recycled feedstock is used instead of virgin fossil resources at the beginning of the value chain. Furthermore, we develop processes to reduce greenhouse gas emissions in our existing plants.

Portfolio

Cracker products

BASF produces the entire range of cracker products from ethylene and propylene to butadiene, butenes and benzene. Propylene is the most important starting product for BASF's value chains.

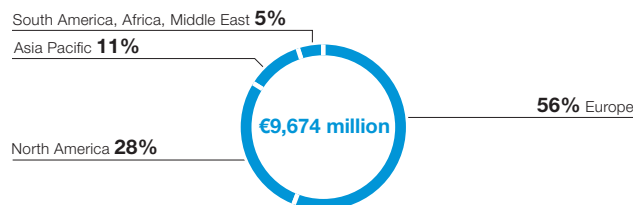
Acrylic monomers and superabsorbent polymers

BASF is a technology leader in acrylic acid and the world's largest and most widespread producer of acrylic monomers, which are sold to internal and external customers in the form of acrylic acid, acrylic esters and specialty acrylates. Acrylic monomers are used as precursors to manufacture acrylic polymers and polymer dispersions for various applications such as:

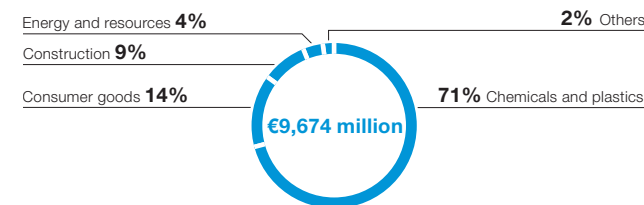
- Superabsorbent polymers
- Adhesives
- Flocculants
- Coatings
- Surfactants

Superabsorbent polymers (SAP) are used in various hygiene applications, such as baby diapers, adult incontinence products and feminine hygiene articles. With our global production network, we are close to our customers. Through our market knowledge and R&D expertise, we aim to foster trusted relationships with customers and partners in the global hygiene industry.

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



Alkylene oxides and glycols

Ethylene oxide derived from ethylene is used mainly to produce surfactants, ethanolamines, glycols, glycol ethers and polyols. Ethylene glycol is used in antifreeze applications and the production of fibers, films and PET (polyethylene terephthalate) plastic bottles.

Alcohols and solvents

BASF is the world's largest producer of oxo alcohols and is also a major producer of oxygenated solvents in Europe, including acetates, glycol ethers, glycol ether acetates and specialty solvents. Major customer industries are paints and coatings, pharmaceuticals and cosmetics.

Plasticizers

BASF offers a broad product portfolio of general purpose and special purpose plasticizers. Plasticizers give flexibility to PVC products such as cables or films. At the same time they offer protection against the effects of weathering and temperature, thereby helping to maintain the product's functionality. Plasticizers are used in a large number of industries such as construction, automotive, toys and medical devices.

Styrenics

The styrenics value chain of BASF comprises styrene monomer, polystyrene, extruded polystyrene (XPS, with the brand Styrodur®) and expandable polystyrene (EPS, with the brands Styropor® and Neopor®). The most important industries for BASF's styrenics business are packaging and construction, where the unique properties

of styrenic polymers allow customers to realize various eco-efficient solutions, for example, as insulation material.

BASF's market position

- Acrylic monomers: No. 1 globally
- Ethylene oxide and ethylene glycols: No. 2 in Europe
- Expandable polystyrene: No. 1 (grey), No. 2 (white) in Europe
- Oxo alcohols: No. 1 globally
- Plasticizers: No. 2 in Europe
- Solvents: No. 2 in Europe
- Superabsorbents: No. 2 globally

Main competitors (alphabetical order)

- Acrylic monomers: Arkema, Dow, Satellite
- Alcohols and solvents: Dow, Eastman, Evonik, ExxonMobil Chemical, Luxi, Oxea
- Cracker products: Dow, ExxonMobil, INEOS, LG Chem, Lotte Chemicals, LyondellBasell, SABIC, Sinopec
- Ethylene oxide and glycols: Dow, INEOS Oxide, Lotte Chemicals, Reliance, SABIC, Sanjiang Fine Chemicals, Shell, Sinopec
- Expandable polystyrene: Stryopek, Synthos, Trinseo, Wuxi Xingda
- Plasticizers: Eastman, Evonik, ExxonMobil, UPC
- Superabsorbents: Evonik, LG Chem, Nippon Shokubai, Sanyo

Focus of research and development

We aim to set the benchmark for cost competitiveness and environmental footprint. The focus is on developing new processes and optimizing our existing ones. We want to be a thought and action leader in sustainability with a special focus on CO₂ reduction and the circular economy. In terms of product innovation, we advance research in the field of superabsorbent polymers and styrenics.

Key capabilities of BASF

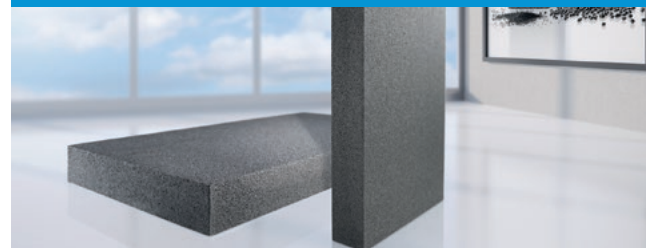
- Strong Verbund sites with world-scale production facilities
- Leading process technology and operational excellence
- Capabilities for greenhouse gas emission reduction
- Strong global market position with regional production
- Outstanding market knowledge and technical capabilities

Acquisitions/JVs/investments/divestitures

From 2019 onward

Product group	Description	Year
Ethylene, propylene	Feedstock flexibilization of steam cracker in Antwerp, Belgium	2019
Ethylene oxide	Expansion of integrated EO complex in Antwerp, Belgium	2022
Superabsorbent polymers	Closure of superabsorbent production in Mannheim, Germany	2022
	Investment in excellence center in Antwerp, Belgium	2023
tert-butyl acrylate	New plant in Nanjing, China	2023
Cracker products and downstream	Establishment of an integrated Verbund site in Zhanjiang, Guangdong, China	until 2030

Innovation



BASF closes EPS recycling loop

With Neopor® F 5 Mycled™, BASF can offer an insulation raw material with a closed EPS recycling loop for the first time. Neopor® Mycled™ contains 10% mechanically recycled material and is suitable for numerous applications in buildings, particularly facade insulation. Both the recycled material used and the insulation raw material are REDcert²-certified.

Major nameplate capacities of BASF

Thousand metric tons per year

Product group	Location													Total ⁵
	Antwerp, Belgium	Camaçari, Brazil	Cornwall, Canada	Freeport, Texas	Geismar, Louisiana	Rayong, Thailand	Kuantan, Malaysia ¹	Ludwigshafen, Germany	Nanjing, China ²	Pasadena, Texas	Port Arthur, Texas ³	Tarragona, Spain ⁴	Ulsan, South Korea	
Ethylene	■							■	■		■			3,480
Propylene	■							■	■		■	■		2,630
Butadiene	■							■	■		■			680
Benzene	■							■	■		■			910
Cyclohexane								■						130
Ethylene oxide (equivalents)	■				■			■	■					1,445
Oxo C4 alcohols				■			■	■	■	■				1,625
Plasticizers (incl. Hexamoll® DINCH)			■					■		■				595
Acrylic acid	■	■		■			■	■	■					1,510
Superabsorbents	■	■		■		■			■					565
Styropor/Neopor								■					■	545

1 BASF 60%; PETRONAS 40%

2 BASF 50%; Sinopec 50%

3 BASF 60%; Total 40%

4 BASF 51%; Sonatrach 49%

5 All capacities in the table illustrate 100% capacity of the operations. BASF's share might be lower.

Intermediates

The Intermediates division manufactures about 600 products, which are sold worldwide. These include butanediol and its derivatives, amines, organic acids, polyalcohols, life science intermediates, solvents and OASE® gas treatment solutions. They are generally quite resilient to economic cycles and are often the result of multistep production processes within BASF. Customers typically purchase them as precursors for their downstream chemicals, and they are widely used for BASF's own downstream products. The Intermediates division focuses primarily on the C1 and C2 value chains.

Portfolio

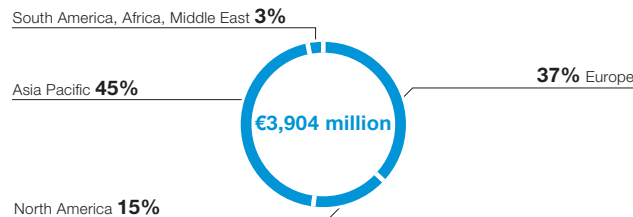
Butanediol and its derivatives

BASF is among the world's largest manufacturers of 1,4-butanediol, which is a chemical building block for products such as polyesters and polyurethanes. Its derivatives are used to manufacture products ranging from fibers to paints, pharmaceuticals and lithium-ion batteries, and include tetrahydrofuran (THF), PolyTHF® and N-methylpyrrolidone (NMP).

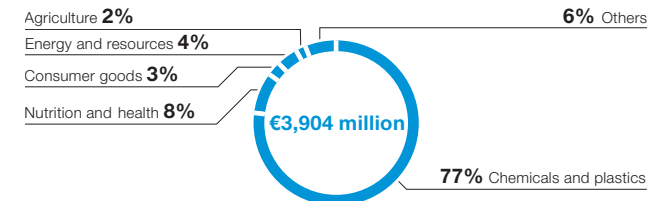
Amines

With about 300 different amines, we have the world's most diverse portfolio of this type of chemical intermediates. Along with alkyl-, alkanol-, alkoxyalkylamines and ethyleneamines, we offer heterocyclic and aromatic as well as specialty amines. The range is completed by a portfolio of chiral amines of high optical and chemical purity. The versatile products are used mainly to manufacture process chemicals, pharmaceuticals and crop protection agents, as well as cosmetic products and detergents. They also serve to produce coatings, specialty plastics, composites and specialty fibers.

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



New products, applications and processes

We follow a differentiated innovation strategy to further grow the strategic business areas. Sustainability is a major driver. We strive to expand our product portfolio as well as the application fields of our existing products where appropriate. At the same time, we are looking for opportunities to improve the efficiency of our processes:

- New products:** We are expanding our portfolio of products with sustainability benefits. Examples are our biomass balance (BMB)¹ products with a particularly favorable product carbon footprint. For example, we have developed a new biomass balance grade for our intermediate 1,2-pentanediol, which is used by our customers in cosmetics applications. We recently supplied our customer Kemira with a BMB product, dimethylethanolamine (DMEOA), which is used to produce flocculants for water treatment plants. Another example is Cycled™ diethylamine (DEA) for our customer Mitsubishi Chemical that is produced with our Chem-Cycling® mass balance approach. In this process, pyrolysis oil generated from plastic or rubber waste is fed into BASF's production at the beginning of the value chain to substitute fossil resources.

Acids and polyalcohols

BASF is the world's leading manufacturer of polyalcohols, such as neopentylglycol (NPG) and 1,6 hexanediol (HDO), and carboxylic acids, such as formic and propionic acid. Carboxylic acids are used as preservatives for the feed and food industries, as auxiliaries for textile and leather applications and as deicing agents. The portfolio also includes higher carboxylic acids such as 2-ethylhexanoic acid (2-EHA) and isononanoic acid (iNA), which are primarily utilized in synthetic lubricants, paint dryer and PVC plasticizer applications. Polyalcohols are mainly offered for the production of a wide range of coatings.

Acetylenics and carbonyl derivatives

These specialty intermediates are based on raw materials from BASF's Verbund, such as acetylene and chlorine. Among the acetylene derivatives are vinyl monomers, acetylenic alcohols and higher alkylopyrrolidones. Chlorine-based intermediates include acid chlorides and chloroformates. Further specialty intermediates are glyoxal and imidazoles, cyclododecanone (CDOn), 2-mercaptoethanol and triphenylphosphine. The products serve as building blocks for crop protection agents and pharmaceuticals or as monomers and performance additives for polymers, coatings and printing inks.

¹ The biomass balance approach allows fossil fuels to be replaced by renewable raw materials in BASF's Production Verbund. The amount of renewable feedstock is allocated to specific products using a third party-verified certification method.

Innovation



Digital tool for efficient gas treatment

BASF's gas treatment customers can use the unique digital platform OASE® connect to design the operation of their plants more efficiently. The tool stores sample analyses and teaches users about gas treatment technologies using e-learning materials. Linked to OASE connect is the innovative OASE digilab tool, which enables real-time analysis of the gas treating agents used. By optimizing the composition of the treating agents, the gas treatment operations can be run particularly efficiently.

- **New applications:** We have developed new applications for our chemical intermediate diethanol isopropanolamine (DEIPA), which has proven to be an efficient cement grinding additive. DEIPA is a liquid, label-free and easy-to-handle amine which can now additionally be used by our customers as an effective curing accelerator in many epoxy formulations. Epoxy resins have a wide range of applications. For example, they are used in industrial flooring and coating materials but also in rotor blades on wind turbines.

- **Improved processes:** The new acetylene plant at the Ludwigshafen Verbund site uses about 10% less fossil resources per ton of product and produces fewer by-products compared to the old process. In addition, we use the excess heat to generate energy, further increasing the efficiency of the process.

BASF's market position

BASF's Intermediates division is among the top three producers worldwide of its products in all strategic business units.

Main competitors (alphabetical order)

- Acetylenics and carbonyl derivatives: Altiavia, Ashland, Evonik, Saltigo, Weylchem
- Acids and polyalcohols: Eastman, Luxi, OQ, Perstorp, Wanhua
- Amines: Dow, Eastman, Evonik, Huntsman, INEOS, Nouryon, Shandong Lianmeng
- Butanediol/derivatives: Dairen, INEOS, LyondellBasell, Wanhua, Xinjiang Lanshan Tunhe

Focus of research and development

The main aim of process innovation is to optimize existing production technologies and develop new, highly efficient processes offering considerable sustainability contributions and cost advantages.

Key capabilities of BASF

- World-scale plants based on leading process technology
- Competitive raw material sourcing and/or backward integration
- Operational, logistical as well as commercial excellence
- Strong market position with regional setup

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Acetylene	Replacement of plant in Ludwigshafen, Germany	2019
Propionic acid	Capacity expansion in Nanjing, China	2019
Specialty amines	New plant in Nanjing, China	2019
Neopentylglycol	Capacity expansion in Nanjing, China	2020
tert-Butylamine	Capacity expansion in Nanjing, China	2021
Propionic acid	Capacity expansion in Nanjing, China	2023
Ethanolamines	Capacity expansion in Nanjing, China	2023
Ethyleneamines	Capacity expansion in Nanjing, China	2023
2-Ethylhexanoic acid	Capacity expansion in Kuantan, Malaysia	2024
Neopentylglycol	New plant in Zhanjiang, China	2025

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
Specialty intermediates	Closure of site in Zachary, Louisiana	2019
1,4-Butanediol	Closure of production line in Chiba, Japan	2020
	Closure of production line in Kuantan, Malaysia	2021

Major nameplate capacities of BASF

Thousand metric tons per year

Product group	Capacity
Alkylamines	250
Ethanolamines and derivatives	440
Specialty amines	>100
Butanediol equivalents	550
PolyTHF®	350
Neopentylglycol (Neol®)	255
Formic acid	305
Propionic acid	180

Materials

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

Divisions

Performance Materials

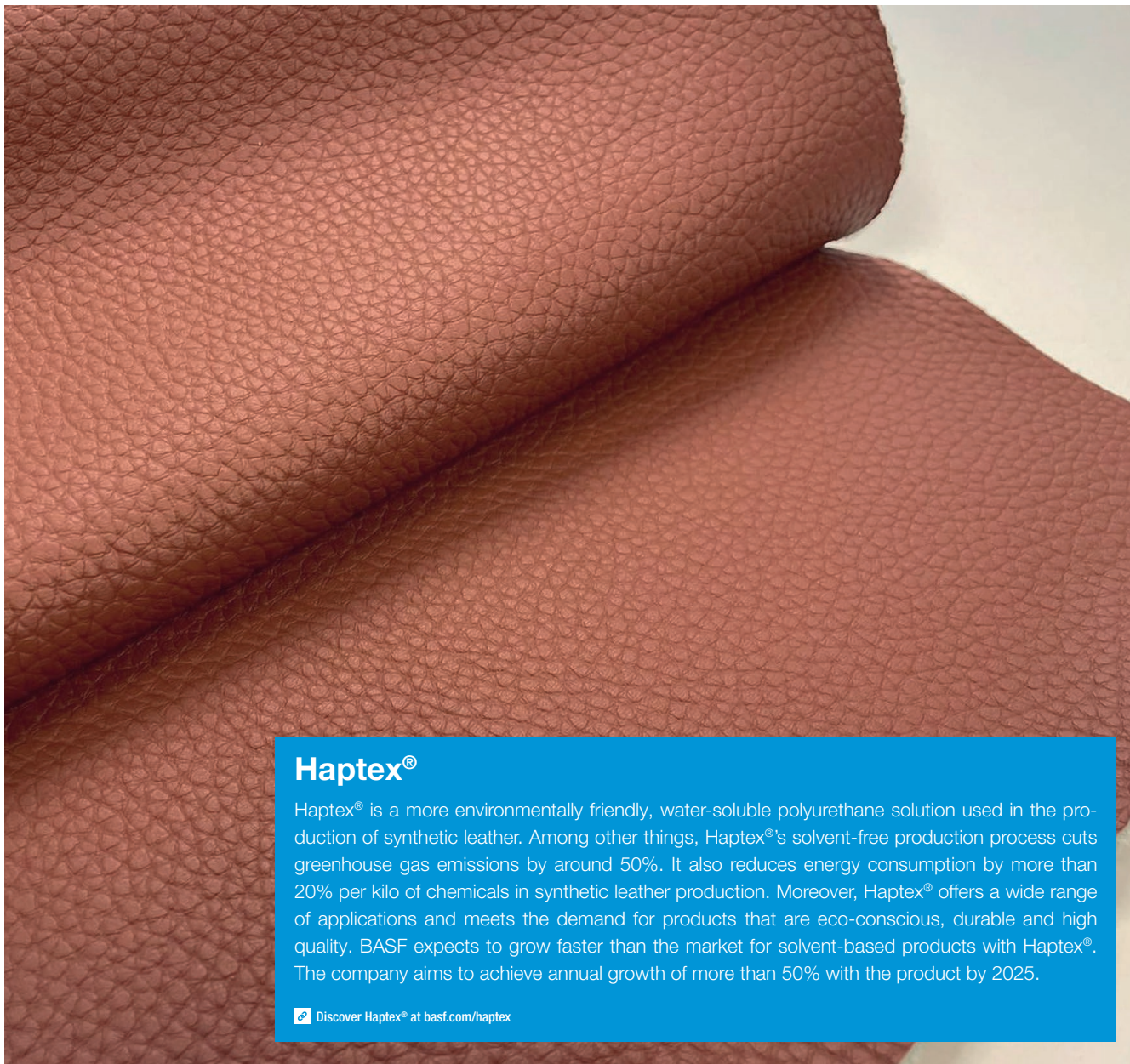
Polyurethanes, thermoplastics and foam specialties for sectors such as the transportation, construction and consumer goods industries, as well as for industrial applications

 page 40

Monomers

Isocyanates and polyamides as well as inorganic basic products and specialties for sectors such as the plastics, automotive and construction industries

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Haptex®

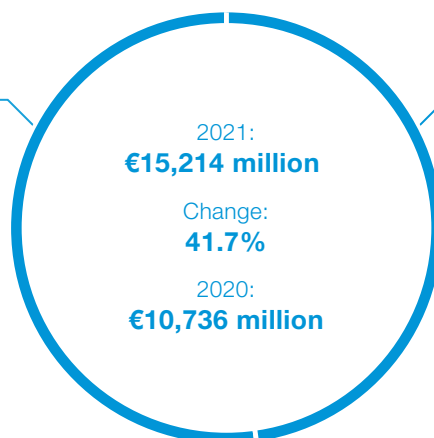
Haptex® is a more environmentally friendly, water-soluble polyurethane solution used in the production of synthetic leather. Among other things, Haptex®'s solvent-free production process cuts greenhouse gas emissions by around 50%. It also reduces energy consumption by more than 20% per kilo of chemicals in synthetic leather production. Moreover, Haptex® offers a wide range of applications and meets the demand for products that are eco-conscious, durable and high quality. BASF expects to grow faster than the market for solvent-based products with Haptex®. The company aims to achieve annual growth of more than 50% with the product by 2025.

 Discover Haptex® at basf.com/haptex

Segment Materials

Sales

Monomers €7,922 million
 Change: **55.3%**
 Share of sales: **52%**



Performance Materials €7,292 million
 Change: **29.4%**
 Share of sales: **48%**

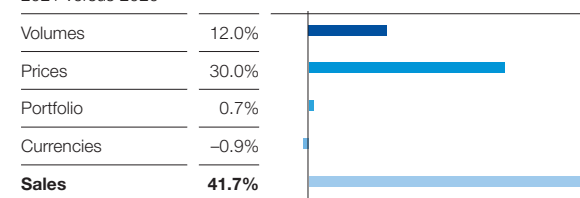
Segment data

Million €

	2021	2020	2019
Sales to third parties	15,214	10,736	11,466
Share of total BASF sales	% 19	18	20
of which Performance Materials	7,292	5,635	6,064
Monomers	7,922	5,101	5,402
Income from operations before depreciation and amortization (EBITDA) before special items	3,208	1,714	1,719
Income from operations before depreciation and amortization (EBITDA)	3,162	1,556	1,691
EBITDA margin	% 20.8	14.5	14.7
Income from operations (EBIT) before special items	2,418	835	1,003
EBIT before special items margin	% 15.9	7.8	8.7
Income from operations (EBIT)	2,345	-109	973
EBIT margin	% 15.4	-1.0	8.5
Return on capital employed (ROCE)	% 22.8	-1.1	10.7

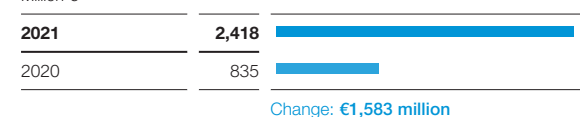
Factors influencing sales

2021 versus 2020



EBIT before special items

Million €



Performance Materials

The Performance Materials division brings together BASF's entire materials know-how regarding innovative, customized plastics under one roof. Active in four major industry sectors – transportation, consumer goods, industrial applications and construction – the division has a strong portfolio of products and services combined with a deep understanding of application-oriented system solutions.

Portfolio

Polyurethanes

Polyurethane solutions make life more comfortable, safer and more pleasant, while helping to save energy. They contribute toward improved insulation of buildings and household appliances, lightweight design of cars, and other consumer products. Several industry fields use the unique advantages of polyurethanes provided with the knowledge and experience of BASF's polyurethane experts worldwide. This product group includes PU (polyurethane) systems, TPU (thermoplastic polyurethanes) and MPU (microcellular polyurethane or Cellasto®) technologies.

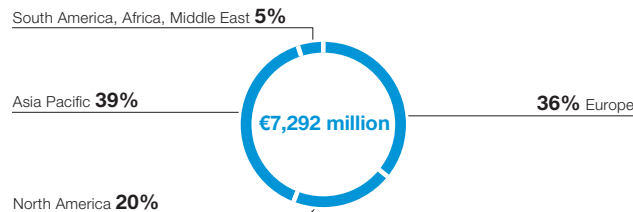
Engineering plastics

Engineering plastics are used in numerous applications, such as automotive engineering, the electrical and electronics sectors, household appliances and precision technology as well as in medical technology. This product group includes Ultraform® based on polyoxymethylene (POM), Ultradur® based on polybutylene terephthalate (PBT) and Ultramid® based on polyamide (PA).

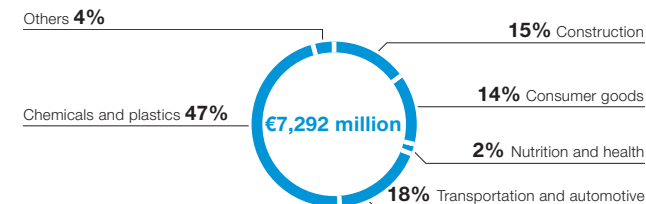
Specialty plastics

Specialty plastics include biodegradable co-polyesters, mainly used in various packaging applications and sold under the ecoflex® and ecovio® brands, as well as Ultrason®, a high-temperature plastic based on polyarylsulfone (PPSU, PSU, PESU) mainly used in household and healthcare applications.

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



Functional foams

Functional foams include Basotect®, a flexible open-cell foam made from melamine resin, as well as the particle foam Neopolen®. Basotect® is used for sound and thermal insulation in the construction and transportation industries and as a cleaning sponge in the consumer industry.

Industry focus

Performance Materials approaches the market with a strong industry orientation, focusing on innovation to address important needs of key market segments. We work jointly with our customers and stakeholders in the industries to introduce innovative solutions by combining our comprehensive portfolio of products with application, engineering, simulation and manufacturing know-how. Customer intimacy and close collaboration are the basis for our solution-selling approach, which is a key driver for profitable growth.

Product/Industry	Transportation	Construction	Consumer	Industrial
PU systems	■	■	■	■
TPU	■	■	■	■
MPU	■		■	■
Engineering plastics	■	■	■	■
Polysulfones	■		■	■
Functional foams	■	■	■	
Biodegradable plastics			■	

BASF's market position

- MPU: No. 1 globally
- PBT compounds: No. 1 globally
- Polyamide 6 and 6.6 compounds: No. 1 globally
- TPU: No. 1 globally

Main competitors (alphabetical order)

- Polyamide 6 and 6.6 compounds: DSM, DuPont, EMS, Lanxess
- Polyurethanes: Covestro, Dow, Huntsman, Wanhua

Focus of research and development

Our innovation focus is on developing new products and applications in key target industries to improve existing solutions and find new ones. Development is driven by local market needs and is coordinated globally to ensure leveraging of key capabilities across regions. Our innovation pipeline focuses on creating solutions for unmet market needs, particularly in developing markets with strong growth potential.

Key capabilities of BASF

- Close collaboration with key customers in target industries worldwide
- Innovation in products, applications, processes and business models
- Technical, engineering and application competence
- Operational excellence ensuring reliability and consistent quality
- Focused specialty businesses

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Polyurethanes	TPU capacity expansion in Lemförde, Germany	2019
	MPU capacity expansion in Dahej, India	2019
	New TPU plant in Zhanjiang, China	2023
Engineering plastics	Acquisition of Solvay's polyamide business	2020
	New Ultramid® (PA) and Ultradur® (PBT) plants in Zhanjiang, China	2022
	Expansion of Ultramid® (PA) capacity in Gujarat, India	2022
	Expansion of Ultramid® (PA) and Ultradur® (PBT) in Pasir Gudang, Malaysia	2023

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
Engineering plastics	Planned closure of Ultramid® compounding site in Leuna, Germany	2022

Major nameplate capacities of BASF

Thousand metric tons per year

Product group	Capacity
Engineering plastics	885

Innovation



© Steelcase

Steelcase Flex Perch: First furniture product based on chemical recycling

BASF and Steelcase have collaborated on Steelcase's new Flex Perch Stool, which has sustainability and circularity at the forefront of its design. This is the first furniture product for Steelcase, one of the world's leading furniture manufacturers, that uses plastics derived from a chemical recycling process. The stool is made with BASF's Ultramid® B3EG6 Cycled™, an injection moldable polyamide (nylon) 6 that utilizes a material from a waste stream generated during electronics production and is a one-for-one replacement for the 100% fossil-derived plastics.

Monomers

The Monomers division supplies a broad portfolio of large-volume monomers, basic polymers and inorganic chemicals. Major products include MDI (methylene diphenyl diisocyanate), TDI (toluene diisocyanate), propylene oxide, caprolactam, adipic acid, hexamethylenediamine, ammonia, polyamide 6 and 6.6, nitric acid, sulfur and chlorine products, inorganic salts, urea, melamine, glues and impregnating resins. The products are used in a broad spectrum of industries, such as the automotive, furniture, construction, wood-working, food, feed, solar, packaging and textile industries.

Portfolio

Isocyanates and propylene oxide

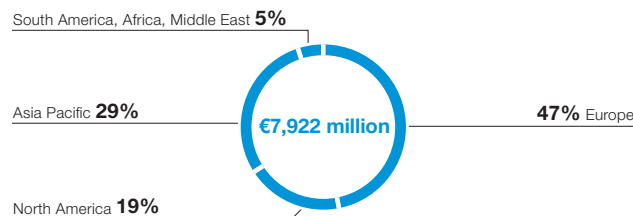
The portfolio of isocyanates consists of MDI and TDI. BASF is a world leader in isocyanates, which are key components to produce soft or rigid foams. MDI is a versatile isocyanate that can be used to make flexible foams as well as semi-rigid and rigid polyurethane plastics. Its primary applications are construction, consumer appliances, automotive components and shoe soles. TDI is an isocyanate used primarily in the manufacturing of flexible foams. Its main applications include mattresses and cushions for furniture and automotive seating.

The portfolio also includes propylene oxide, the main raw material for polyether polyols. Polyols are – together with isocyanates – the second key component for polyurethane foams. Other applications for propylene oxide are propylene glycols, surfactants and amines.

Polyamides and precursors

BASF is the world's leading supplier of high-quality polyamides, with the trade name Ultramid®, and polyamide precursors such as caprolactam, hexamethylenediamine (HMD) or adipic acid. BASF started manufacturing Ultramid® polyamides over 50 years ago. Today, BASF offers a wide product range of polyamides for injection molding and extrusion. The product range includes PA 6 grades

Sales by region 2021 (location of customer)



(Ultramid® B), PA 6.6 grades (Ultramid® A) and special grades based on copolyamides (Ultramid® C).

BASF's polyamides are the materials of choice for many applications:

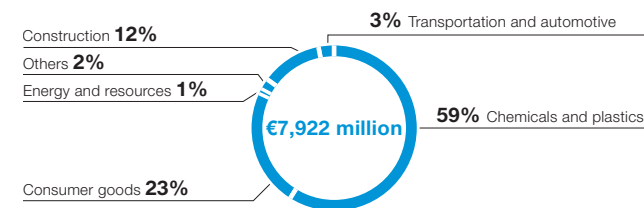
- Engineering plastics: Ultramid® is used to produce molding compounds. Due to their outstanding properties, these materials have become indispensable in almost all fields of engineering for the most varied components and machine parts, as high-quality electrical insulating materials and for many special applications.
- Films for food packaging: Ultramid® is especially well-suited for the packaging sector due to its high strength, outstanding thermoformability, high thermal stability and very good barrier properties towards gases, especially oxygen, flavors and aromas.
- Textiles and carpets: The variety of Ultramid® grades for textiles enables the manufacturing of superior quality textiles for hosiery, swimwear and high-tech outdoor garments as well as high-end polyamide carpets and technical fiber applications.

Inorganic chemicals

Inorganic chemicals are mainly used as precursors for plastics, amines and other high-value chemicals. The product portfolio ranges from basic chemicals to inorganic salts:

- Ammonia
- Ammonium salts
- Caustic soda

Sales by direct customer industry 2021



- Chlorine
- Nitric acid
- Standard alcoholates
- Sulfuric acid

More than half of these products are for captive use within BASF's Verbund. The remaining products are sold primarily to other chemical companies. We are also one of the leading suppliers of sodium nitrate (used as a component for solar thermal power plant storage media), sodium methylate (a catalyst used for the production of biodiesel) and a variety of inorganic salts for different industries such as food, feed, textiles and paper.

Glues and impregnating resins

BASF, the inventor of Kaurit® and Kauramin® glues, is the number one producer and seller of glues and impregnating resins for different types of panel boards and laminated flooring. The portfolio encompasses liquid and powder glues specifically developed to produce a broad range of wood-based materials that meet low-emission standards. Powder glues are also used in other industries, for example, to produce clutch linings in vehicles. BASF's impregnating resins have been designed for the treatment of various papers, including for overlay, counterbalance and decor papers for the flooring or furniture industry. Additionally, the unit produces AdBlue®,

a high-purity urea solution that is used in trucks and passenger cars to reduce NOx emissions from diesel engines.

BASF's market position

- Glues and impregnating resins: No. 2 in glues in Europe
- Inorganic chemicals: No. 1 in inorganic salts in Europe and South America
- Isocyanates – TDI: No. 3 globally, MDI: No. 2 globally
- Polyamide film: No. 1 globally
- Polyamide 6.6: No. 2 in Europe

Main competitors (alphabetical order)

- Glues and impregnating resins: Dynea, Kronospan, Sadepan, Silekol
- Inorganic chemicals: Evonik, Esseco
- Isocyanates: Covestro, Dow, Huntsman, Wanhua
- Polyamide film: AdvanSix, DSM, Lanxess, Ube
- Polyamide 6.6: Ascend, Domo, Invista, Radici
- Polyols: Dow, Covestro, Shell

Focus of research and development

The main aim of process innovation is to optimize existing production technologies and develop new, highly efficient processes offering considerable cost advantages.

Key capabilities of BASF

- World-scale plants based on leading process technology
- Competitive raw material sourcing and/or backward integration
- Operational, logistical as well as commercial excellence
- Strong market position with regional setup

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Polyamide	Acquisition of Solvay's polyamide business	2020
MDI	Expansion of MDI production in Geismar, Louisiana (first and second phases) ¹	2020–2021
Sodium methylate	Expansion of sodium methylate plant in Guaratinguetá, Brazil	2020
HMD	New world-scale HMD plant in Chalampé, France	2024

¹ The final phase of the expansion project is targeted for completion by the middle of the decade.

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
TDI	Shutdown of TDI plant in Schwarzeide, Germany	2020

Major nameplate capacities of BASF

Thousand metric tons per year

Product group	Capacity
Ammonia	1,765
Adipic acid ¹	720
Chlorine	595
Glues and impregnating resins	750
Sulfuric acid	920
Urea	545
Caprolactam	700
Polyamide	925
MDI	1,920
TDI	780
Propylene oxide	675

¹ Including joint ventures

Innovation



© VAUDE/Attenberger

Sustainable and durable outdoor pants based on chemically recycled feedstock

With BASF's Ultramid® B Ccycled™ the German outdoor company VAUDE has developed sustainable outdoor pants that are of equal product quality to conventional ones. 100% of the fossil feedstock used to produce Ultramid B Ccycled has been replaced by pyrolysis oil from end-of-life tires in a certified mass balance approach. As these tires cannot be mechanically recycled, chemical recycling offers a route to a sustainable feedstock. The Higg Index, a tool for sustainability assessments for the apparel industry, shows that replacing the fossil feedstock reduces the carbon footprint by more than half compared with a garment made from conventional polyamide.

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 fuel and lubricant solutions, polymer dispersions, resins, electronic materials, antioxidants, light stabilizers, oilfield chemicals, and mineral processing and hydrometallurgical chemicals. We aim to grow organically in key industries such as automotive, plastics, electronics, and energy and resources, and expand our position by leveraging our comprehensive industry expertise and application know-how.

Divisions

Dispersions & Resins

Raw materials used to formulate products in the coatings, construction, paper, printing and packaging, adhesives and electronics industries

 page 46

Performance Chemicals

Customized products for various customer industries such as chemicals, plastics, consumer goods, energy and resources, as well as automotive and transportation

 page 48



acResin® for more sustainable self-adhesives

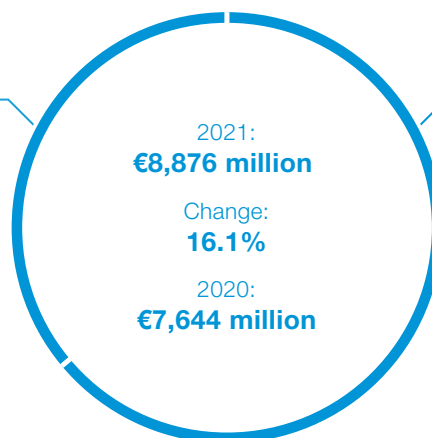
acResin® is a high-performance UV-curable hotmelt made of 100% acrylic. We want to play a key role in making the self-adhesives market more sustainable with this product, which is why we have steadily expanded the range of applications for acResin® and plan to continue to do so in the future. An eco-efficiency analysis certified by TÜV, an independent testing services provider, showed that compared with traditional solvent-based adhesives, acResin® enables a significant reduction in CO₂ emissions of around 60%. Due to the consistent rise in market demand and range of applications, BASF expects to continue to grow by around 8% annually with acResin® until 2026.

 Discover acResin® at basf.com/acresin

Segment Industrial Solutions

Sales

Performance Chemicals €3,195 million
 Change: **15.1%**
 Share of sales: **36%**



Dispersions & Resins €5,681 million
 Change: **16.7%**
 Share of sales: **64%**

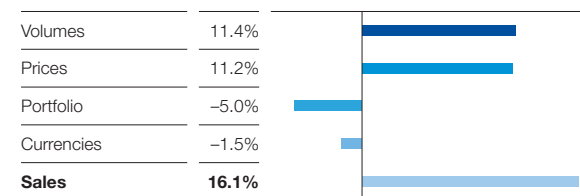
Segment data

Million €

	2021	2020	2019
Sales to third parties	8,876	7,644	8,389
Share of total BASF sales	% 11	13	14
of which Dispersions & Resins	5,681	4,869	5,178
Performance Chemicals	3,195	2,775	3,211
Income from operations before depreciation and amortization (EBITDA) before special items	1,343	1,189	1,249
Income from operations before depreciation and amortization (EBITDA)	1,344	1,099	1,327
EBITDA margin	% 15.1	14.4	15.8
Income from operations (EBIT) before special items	1,006	822	820
EBIT before special items margin	% 11.3	10.8	9.8
Income from operations (EBIT)	965	630	889
EBIT margin	% 10.9	8.2	10.6
ROCE	% 15.2	9.3	12.5

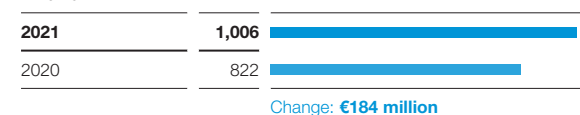
Factors influencing sales

2021 versus 2020



EBIT before special items

Million €



Dispersions & Resins

The Dispersions & Resins division is the leading global supplier of raw materials used in formulations for a number of industries, including coatings, construction, adhesives, printing and packaging, electronics and paper. Our portfolio encompasses dispersions, resins and a broad range of additives, such as performance and formulation additives as well as electronic materials. We put a strong emphasis on environmentally friendly systems, such as low-VOC (volatile organic compound) water-based coatings.

Portfolio

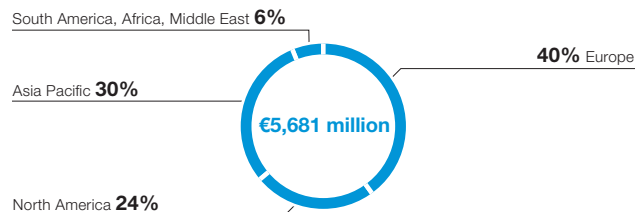
Dispersions

Polymer dispersions are water-based systems used in formulations for adhesives, sealants, architectural coatings, paper coatings, construction and fiber bonding materials. Our strength lies in our backward integration into acrylics, strong technical expertise and application know-how. In addition, our worldwide presence is a key advantage in serving our global customer base.

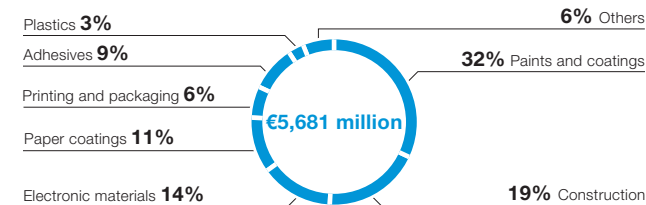
Resins

Resins are film-forming components used in industrial, automotive and wood coatings as well as in printing and packaging for ink formulations and barrier coatings. The comprehensive product portfolio includes water-based resins, acrylic oligomers, polyisocyanates, amino resins, aldehyde resins, vinyl chloride copolymers and high-solid polyols. Our portfolio offers customers a wide range of water-based technologies that fulfill regulatory requirements regarding VOCs (volatile organic compounds).

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



Additives

BASF offers a broad range of performance and formulation additives that significantly improve the quality and performance of paints and coatings. BASF is a market leader for performance additives, particularly in light stabilizers. Light stabilizers protect paint films against degradation and a number of undesirable effects, including changes in appearance from long-term exposure to UV radiation. Our formulation additives offer solutions in the range of defoamers, dispersing agents, film-forming agents, rheology modifiers as well as wetting agents and surface modifiers to improve the properties of coatings. Our unique portfolio is based on a broad technology platform and helps performance-driven products to meet the latest and most stringent environmental regulations.

Electronic materials

BASF is able to deliver fully customized solutions for next-generation semiconductor and display manufacturing processes and metal systems. Our portfolio includes ultra-pure process chemicals, advanced materials for semiconductor manufacturing, high-end formulations for displays as well as products for injection molding and metal systems (Catamold® and carbonyl iron powder). We provide reliable services and innovative solutions to customers in the fast-paced electronics industry.

BASF's market position

- Additives: No. 2 globally in performance and formulation additives
- Dispersions: No. 1 globally for water-based dispersions in the focus industries architectural coatings, adhesives, construction, fiber bonding materials and paper coatings
- Electronic materials: leading market position in ultra-pure materials for the semiconductor industry
- Resins: No. 2 globally in high-performance resin technologies

Innovation



A new solution for electric mobility

BASF offers a new Licity® product range for lithium-ion battery manufacturing to pave the way for electric mobility. Licity® anode binders are materials that improve battery performance with sustainability features, enabling higher capacity, an increased number of charge and discharge cycles, and reduced charging times. It is a new binder technology that pushes the capabilities of lithium-ion batteries, thus supporting the wider adoption of electric vehicles.

Main competitors (alphabetical order)

- Additives: Altana, Elementis, Everlight, Evonik, Rianlon, Songwon
- Dispersions: Arkema, Baolijia, BATF, Covestro, Dow, Synthomer, Trinseo, Wacker, Wanhua
- Electronic materials: CMC Materials, Dongjin Semichem, DuPont, ENF, Entegris, Merck, Shanghai Sinyang
- Resins: Allnex, Arkema, Covestro, Eternal, Indulor, Miwon

Focus of research and development

We invest in research and development to create innovative, differentiating and more sustainable products and solutions. Our innovations allow our customers to offer environmentally friendly solutions with dispersions for applications in the coatings, printing, adhesives and construction industries. In addition, customers benefit from new and improved resins and formulation additives, which enable them to upgrade the performance of their product portfolio. In electronic materials, the focus is on developing innovative solutions for the electronics industries, for example, for semiconductors. We advance digital and automation solutions in our laboratory environment to optimize our efficiency.

Key capabilities of BASF

- Leading technology and cost position enable consistent product quality, reliability and competitiveness
- Comprehensive portfolio of raw materials for coatings, printing and packaging inks, adhesives and construction materials
- Strong technical and application know-how, professional service, close to our customers
- Global production footprint close to relevant markets

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Resins	Capacity expansion in Ludwigshafen, Germany	2016–2019
Additives	Capacity expansion in Nanjing, China	2020
Dispersions	Capacity expansion in Castellbisbal, Spain	2020
	Capacity expansion in Pasir Gudang, Malaysia	2021
	Capacity expansion in Dahej, India	2022
Electronic materials	Capacity expansion in Jiaxing, China	2023
Dispersions and resins	Capacity expansion in Huizhou, China	2024

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
Dispersions	Closure of plant in Callao, Peru	2020
Resins and additives	Closure of plant in West Memphis, Arkansas	2021
Pigments	Divestiture of the pigments business	2021
Additives	Divestiture of plant in Quincy, Florida	2022

Major production sites

BASF's dispersions, resins, additives and electronic materials are produced at 54 sites worldwide. Our most important sites for each product group are listed below.

Product group	Site
Additives	Heerenveen, Netherlands; Nanjing, China; Schweizerhalle, Switzerland
Dispersions	Cengkareng, Indonesia; Chattanooga, Tennessee; Dagang, Huizhou and Shanghai, China; Dahej, India; Freeport, Texas; Heerenveen, Netherlands; Guaratinguetá, Brazil; Hamina, Finland; Ludwigshafen, Germany; Monaca, Pennsylvania; Pasir Gudang, Malaysia; Tarragona, Spain
Electronic materials	Kuan Yin and Taichung, Taiwan; Ludwigshafen, Germany; Singapore; Shanghai, China; Yeosu, South Korea
Resins	Ludwigshafen and Schwarzeide, Germany; Shanghai, China

Performance Chemicals

As an innovative partner, BASF's Performance Chemicals division offers chemicals for various customer industries, such as plastics, automotive, refineries, lubricants, oilfield and mining. Our highly qualified and experienced team with outstanding market knowledge as well as our innovation platform and application know-how ensure our technological competence to provide excellent solutions to our customers.

Portfolio

Plastic additives

BASF is the globally leading supplier for stabilizers and additive blends to the plastics and rubber industries. The product range includes high-performance light and thermal stabilizers, antioxidants, process stabilizers, UV absorbers and other specialty additives for those industries. The portfolio is constantly analyzed, assessed and actively improved toward solutions which make a larger contribution to sustainability. The main fields of application are:

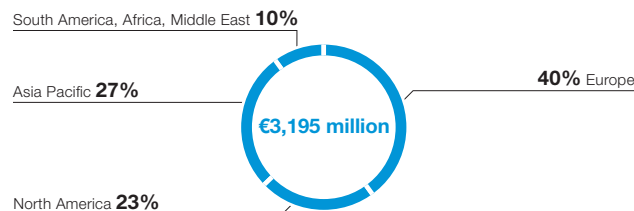
- Automotive
- Agricultural films
- Construction materials
- Packaging and consumer goods
- Electrical and electronics
- Fibers and tapes

Fuel and lubricant solutions

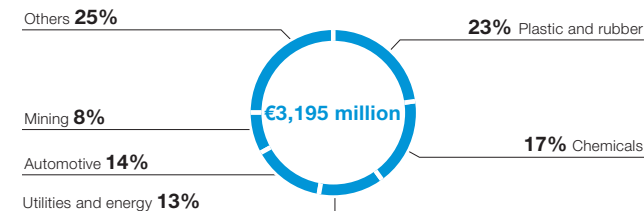
BASF is one of the leading suppliers of formulations and components for the global automotive and mineral oil industries. Our portfolio includes:

- Brake fluids and engine coolants
- Fuel and refinery additives, lubricant additives and additive packages, base stocks, lubricants
- Low, medium and high molecular weight polyisobutene (PIB)

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



Kaolin minerals

Kaolin is a naturally occurring white mineral that BASF converts to a high-performance material for automotive, construction, printing and agricultural applications. BASF is one of the largest producers of calcined kaolin and a leading global supplier to segments such as paints, inks, coatings, plastics and rubber, thermal paper and catalytic substrates.

On November 18, 2021, BASF and KaMin LLC. / CADAM S.A. (KaMin) signed an agreement to sell BASF's kaolin minerals business to KaMin, a global performance minerals company headquartered in Macon, Georgia, United States. Pending approval by the relevant merger control authorities, closing of the transaction is expected in the second half of 2022. The divestiture comprises the production hub with sites in Daveyville, Toddville, Edgar, Gordon and related mines, reserves and mills in Toombsboro and Sandersville in Georgia.

Oilfield chemicals and mining solutions

For the oilfield industry, we offer a wide range of products that help our customers develop efficient formulations for the oil and gas industry. Our product portfolio includes:

- Additives for drilling, cementing and stimulation for the completion of production wells
- Production additives to ensure an efficient flow of valuable oil and gas resources
- Standard surfactants and polymers as well as next-generation products for enhanced oil recovery

For the mining industry, our offer includes reagents, equipment and process technologies focusing on applications such as solid/liquid separation, solvent extraction, tailings management, flotation, materials handling and grinding. Our mineral processing expertise can help to achieve operational, economic and environmental benefits.

BASF's market position

BASF's Performance Chemicals business holds a leading market position in most industry segments: BASF is the global market leader in plastic additives and is market leading in major segments of the fuel and lubricant solutions business. In our mining and oilfield business as well as in kaolin, we hold leading positions in attractive segments.

Main competitors (alphabetical order)

- Fuel and lubricant solutions: Afton, CCI, Lanxess, OWI, Shell, TPC Group
- Kaolin minerals: Burgess, Imerys, KaMin
- Oilfield chemicals and mining solutions: Baker Hughes, ChampionX, Dow, SNF, Solvay
- Plastic additives: Addivant, Adeka, Sabo, Solvay, Songwon

Focus of research and development

Developing solutions together with our customers and ensuring technology leadership to improve our cost position are key to the success of Performance Chemicals. By leveraging the breadth of our competencies, we develop products that help improve the performance of our customers' products and processes. We utilize advances in data analytics, modelling and automation to accelerate development and enable faster implementation of innovations. With sustainability as a key growth driver for our businesses, we focus our innovation pipeline on solutions that will enable the transformations in the end markets. Key fields are resource efficiency, emissions reduction and the circular economy.

Key capabilities of BASF

- Excellent innovation platform and application know-how
- Customer proximity and market focus
- Technological competence to provide excellent solutions to our customers
- Continuous improvements in cost competitiveness in production

Major production sites

Product group	Site
Plastic additives	Kaisten, Switzerland; Lampertheim, Germany; Manama, Bahrain; McIntosh, Alabama; Pontecchio Marconi, Italy; Puebla, Mexico; Shanghai, China; Singapore
Fuel and lubricant solutions	Antwerp, Belgium; Cincinatti, Ohio; Dahej, India; Geismar, Louisiana; Guaratinguetá and Jacarei, Brazil; Kaisten, Switzerland; Kuantan, Malaysia; Lampertheim and Ludwigshafen, Germany; McIntosh, Alabama; Meaux, France; Nanjing and Shanghai, China; Puebla, Mexico; Singapore
Oilfield chemicals and mining solutions	Cork, Ireland; Ludwigshafen and Trostberg, Germany; Jacarei, Brazil; Nanjing, China
Kaolin minerals	Several sites in Middle Georgia, United States

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Plastics additives	New world-scale antioxidants plant in Shanghai, China	2019
	Capacity expansion for antioxidants in Pontecchio Marconi, Italy	2021
	Capacity expansion for Irganox® 1010 in Singapore	2022
	Capacity expansion for hindered amine light stabilizers in Pontecchio Marconi, Italy, and Lampertheim, Germany	2022
Fuel and lubricant solutions	Investment for engine coolants in Cincinatti, Ohio	2019
	Capacity expansion for synthetic ester base stocks in Jinshan, China	2022
Mining solutions	New production line for polyacrylamide powder in Nanjing, China	2019

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
Paper and water chemicals	Transfer of BASF's paper wet-end and water chemicals business to Solenis	2019
Ultrafiltration membrane business	Transfer to DuPont Safety & Construction, including the shares in Inge GmbH	2019
Kaolin minerals business	Sale of kaolin minerals business to KaMin LLC. / CADAM S.A. (KaMin)	2022

Innovation



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New range of additive solutions for plastics recycling

The plastics industry is seeking ways to incorporate higher content of recycled polymeric material in all major applications to meet sustainability goals. However, recycled plastics often contain impurities and contaminants that accelerate polymer degradation, which changes the material properties. The new IrgaCycle™ range includes additive solutions that can help increase the percentage of recycled content in several end-use applications such as packaging, automotive and mobility, and building and construction. These solutions address specific quality issues associated with recycled resins, such as limited processability, poor long-term thermal stability and insufficient protection from outdoor weathering.

Surface Technologies

The Surface Technologies segment comprises the Catalysts and Coatings divisions, which offer chemical solutions for surfaces. Its portfolio serves the automotive and chemical industries 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 and supply reliability 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.

Divisions

Catalysts

Mobile emissions catalysts, chemical catalysts and adsorbents, refining catalysts, battery materials, precious and base metal products and services, precious metal trading, recycling, clean air technologies

 page 52

Coatings

Automotive OEM coatings, automotive refinish coatings and services, decorative paints, surface-applied treatments for metal, plastic and glass substrates for a wide range of industries

 page 54



Tri-Metal Catalyst technology

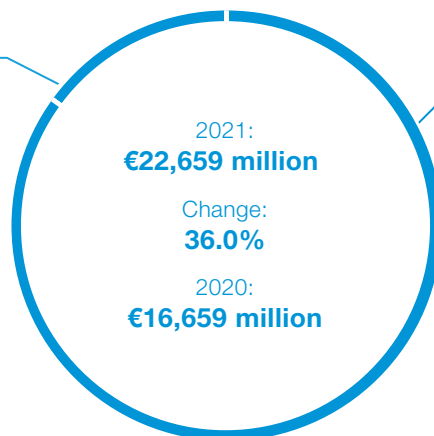
BASF's innovative Tri-Metal Catalyst technology enables the partial substitution of palladium with platinum in production processes. Although slightly more palladium is produced every year than platinum, demand for palladium is currently around three times higher. Tri-Metal Catalysts help to reduce costs for automotive manufacturers and partially alleviate deficits in the platinum metals market. With this technology, BASF expects to expand its market share and anticipates a total sales potential of around €175 million by 2026.

 Discover Tri-Metal Catalysts at catalysts.basf.com

Segment Surface Technologies

Sales

Coatings €3,440 million
 Change: **11.4%**
 Share of sales: **15%**



Catalysts €19,219 million
 Change: **41.6%**
 Share of sales: **85%**

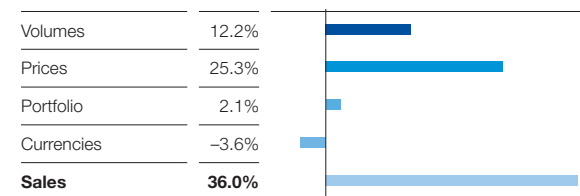
Segment data

Million €

	2021	2020	2019
Sales to third parties	22,659	16,659	13,142
Share of total BASF sales	% 29	28	22
of which Catalysts	19,219	13,570	9,396
Coatings	3,440	3,089	3,746
Income from operations before depreciation and amortization (EBITDA) before special items	1,277	966	1,173
Income from operations before depreciation and amortization (EBITDA)	1,243	900	1,120
EBITDA margin	% 5.5	5.4	8.5
Income from operations (EBIT) before special items	800	484	722
EBIT before special items margin	% 3.5	2.9	5.5
Income from operations (EBIT)	761	-587	663
EBIT margin	% 3.4	-3.5	5.0
Return on capital employed (ROCE)	% 5.6	-4.8	5.7

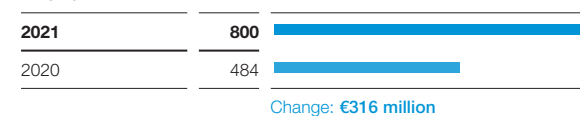
Factors influencing sales

2021 versus 2020



EBIT before special items

Million €



Catalysts

BASF's Catalysts division is the global market leader in catalyst technologies. The division develops and produces mobile emissions catalysts as well as process catalysts and technologies. It is also the home of BASF's battery materials business and provides precious and base metals sourcing, recycling and management services. BASF expands its leading role in catalyst technology through continuous process and product innovation.

Portfolio

Mobile emissions catalysts

BASF's mobile emissions catalysts enable cost-effective regulatory compliance, providing technologies that control emissions from gasoline and diesel-powered passenger cars, trucks, buses, off-road vehicles and motorcycles.

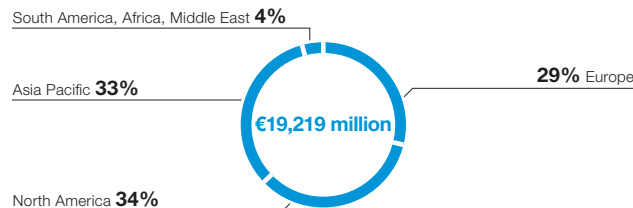
Precious metal services

The global business unit Precious Metal Services supports BASF's mobile emissions catalysts business and its customers with services related to precious metals sourcing and management. It purchases, refines, sells, distributes, stores and offers transportation services for metals. The business produces precious metals chemicals and temperature sensors and is a global leader in precious metals recycling and refining. In addition, it provides a variety of pricing and delivery arrangements to meet logistical, financial and price-risk management requirements.

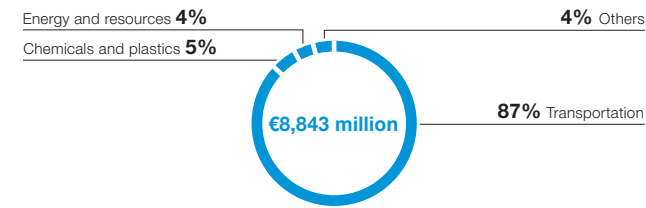
Process catalysts

BASF is a leading global manufacturer of catalysts for the chemical industry, with solutions across the chemical value chain. The business comprises chemical catalysts and adsorbents, refinery catalysts and custom catalysts.

Sales by region 2021 (location of customer)

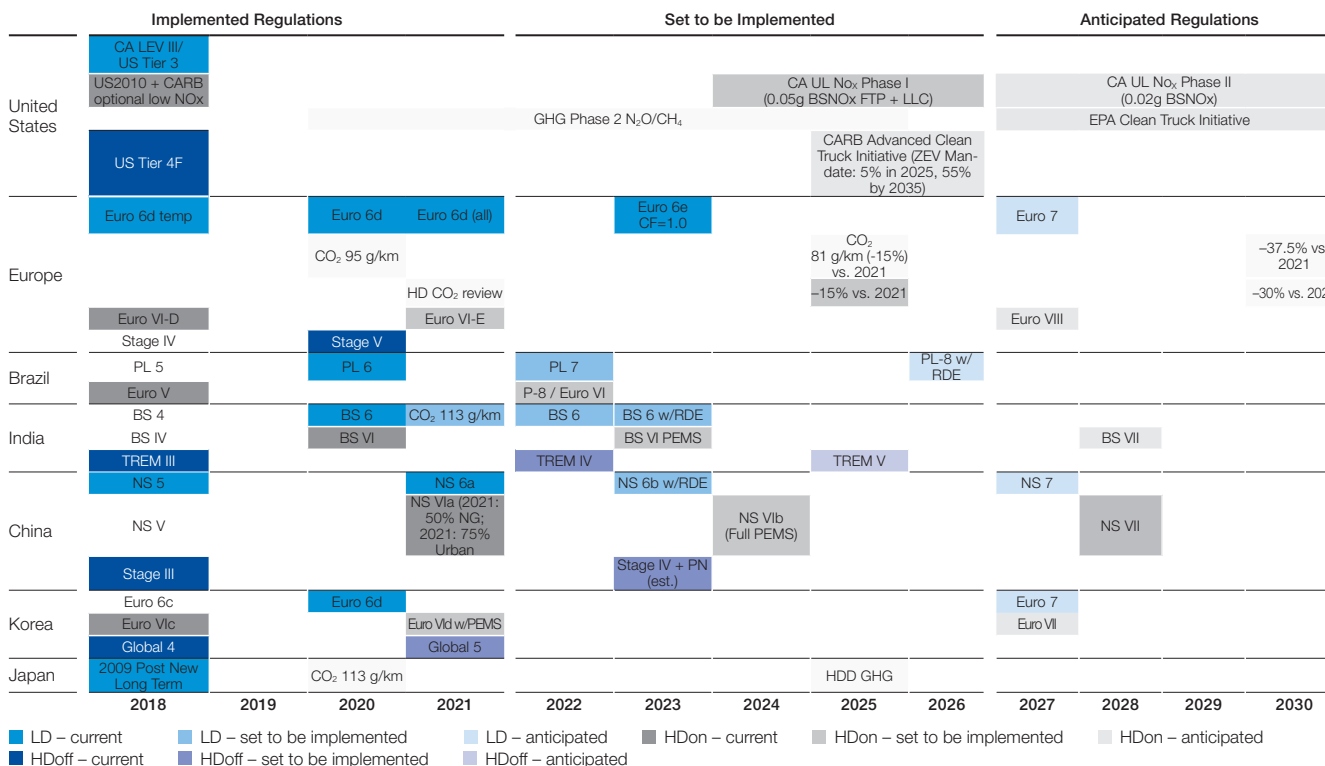


Sales by direct customer industry 2021¹



¹ Excluding precious metal trading

Emissions catalysts market – regulation remains primary demand driver



Innovation



High energy-density cathode active material

BASF's innovative high energy-density cathode active material (CAM), NCM-307, will balance sustainability, cost and performance in e-mobility applications. By eliminating cobalt and reducing nickel, battery cells with this CAM will offer significantly lower costs per kilowatt hour while achieving a volumetric energy density close to that of high-nickel materials. In addition, the impact of price fluctuation is mitigated and the product has an enhanced metal sustainability footprint.

Battery materials

BASF is a leading global supplier of advanced cathode active materials (CAM) for the lithium-ion batteries market, providing high energy-density CAM to the world's largest cell producers and for leading platforms of OEMs. BASF has a global presence with R&D and production capacity operating or announced in all regions, often leveraging partnerships. BASF is a frontrunner in developing innovative solutions and conducting next-generation battery materials research.

Battery base metals and recycling

The global business unit Battery Base Metals & Recycling supports BASF's battery materials business and its customers with services

related to base metals sourcing and management. It purchases, sells, distributes, stores and offers transportation services for metals. In addition, we offer closed loop battery recycling services for our customers in the e-mobility value chain. This unit also provides a variety of pricing and delivery arrangements to meet logistical, financial and price-risk management requirements.

BASF's market position

- Chemical catalysts: No. 2 globally
- FCC refinery catalysts: No. 3 globally
- Mobile emissions catalysts: No. 1 globally

Main competitors (alphabetical order)

- Battery materials: Easpring, Ecopro, LG Chem, Posco, Ronbay, Sumitomo Metal Mining, Umicore
- Chemical catalysts: Clariant, Johnson Matthey, Topsoe
- FCC refinery catalysts: Albemarle, W.R. Grace
- Mobile emissions catalysts: Johnson Matthey, Umicore

Focus of research and development

For mobile emissions catalysts, the focus is on improved products to meet future vehicle emission standards. In the process catalysts business, priority is given to developing new and improved products. For battery materials, the focus is on offering comprehensive products meeting customers' requirements for e-mobility applications, including improving energy density to extend driving range as well as stability, safety and cost.

Key capabilities of BASF

- Global R&D footprint covering catalysts and battery materials
- Technology leadership in mobile emissions catalysts, process catalysts and battery materials

- Recognized precious metals expertise
- Strong and growing position in Asia through fully owned entities and joint ventures
- Operational excellence in catalyst and battery materials production and use

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Mobile emissions catalysts	New specialty zeolites manufacturing plant in Ludwigshafen, Germany	2019
	New manufacturing plant in Shanghai, China	2019
	Capacity expansion in Środa Śląska, Poland	2020
	Capacity expansion in Chennai, India	2022
Precious metal services	Acquisition of Zodiac Enterprises LLC assets in Caldwell, Texas, for catalyst recycling	2021
	Refinery capacity expansion in Seneca, South Carolina	2022
	BASF HERAEUS (China) Metal Resource Co., Ltd. formed in China for automotive catalyst recycling	2022
Battery materials	BASF and Shanshan formed joint venture (BASF 51%) for the production of cathode active materials and precursors in China	2021
	New cathode material precursor manufacturing plant in Harjavalta, Finland	2022
	New cathode material manufacturing plant in Schwarzhilde, Germany	2022
	New battery recycling prototype plant in Schwarzhilde, Germany	2023
Process catalysts	Construction of global Catalyst Development and Solids Processing Center in Ludwigshafen, Germany	2024

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
Process catalysts	Closure of the Erie, Pennsylvania, production site	2021

Coatings

BASF's Coatings division offers innovative and ecologically viable solutions for the automotive industry, including both the original equipment manufacturer (OEM) and refinish markets, as well as surface treatment solutions for a variety of markets. BASF also develops and markets decorative paints in Brazil for interior and exterior use in residential and commercial buildings. The portfolio is supplemented by "Beyond Paint Solutions," which enable new applications with innovative surfaces. We combine protection and aesthetics with eco-efficiency in tailor-made customer products and processes.

Portfolio

Automotive OEM coatings solutions

BASF provides complete automotive coatings solutions, including a product portfolio of:

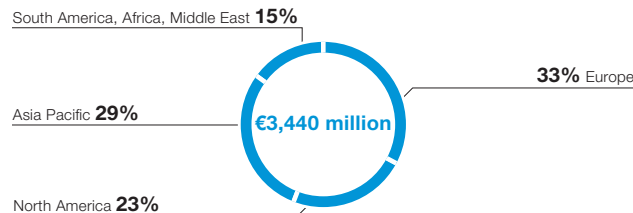
- E-coats
- Primers
- Basecoats
- Clearcoats

In addition to offering extensive technical support, BASF is a valued innovation and design partner for nearly all leading automobile manufacturers worldwide.

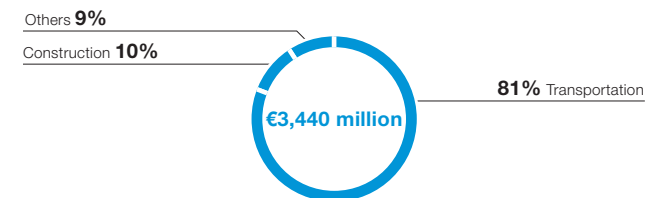
Automotive refinish coatings solutions

For the refinishing of passenger cars and trucks, BASF offers top- and undercoat materials sold under the global premium brands Glasurit® and R-M® as well as the value-for-money brands baslac®, LIMCO®, Norbin® and Yinfan®, which are sold to paint distributors and automotive repair shops. BASF is a leader in the fields of waterborne coatings and high-solid systems, enhanced by value-added services and tools for end users.

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



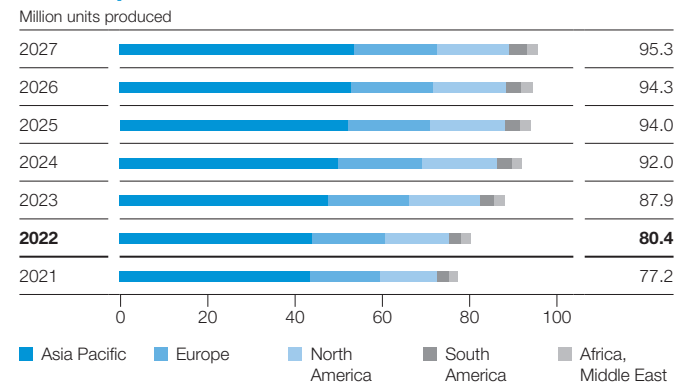
Surface treatment solutions

BASF is a globally leading solution provider for applied surface treatment. Under our Chemetall brand, we offer customized technology and system solutions to protect metals from corrosion, facilitate forming and machining, allow parts to be optimally prepared for the painting process and ensure proper coating adhesion. These products are used in a wide range of industries and markets, such as automotive, aerospace, aluminum finishing and metal forming.

Decorative paints

For interior and exterior use in buildings, BASF offers decorative paints, marketed, for example, under the premium brand Suviniil®, which is one of Brazil's best-known brands. With constant innovation launches, such as super-concentrated premium interior and exterior paint, Suviniil® continues to strengthen its role as a pioneer in the area of innovative paints.

Passenger car and light commercial vehicle production



Source: Global automotive production forecast May 2022 (IHS Markit, now part of S&P Global)

Automotive is the most important customer industry for BASF's coatings business. The number of cars and light commercial vehicles produced globally is expected to grow in the medium term. The main growth driver is Asia – in particular China – where BASF is well-positioned to participate in the growth opportunities.

BASF's market position

- Automotive OEM coatings: No. 2 globally
- Automotive refinish coatings: No. 3 globally
- Decorative paints: No. 1 in Brazil
- Surface treatment: No. 2 globally

Main competitors (alphabetical order)

- Automotive OEM coatings: Axalta, Kansai Paint, Nippon Paint, PPG
- Automotive refinish coatings: AkzoNobel, Axalta, PPG, Sherwin-Williams
- Decorative paints South America: AkzoNobel, PPG, Sherwin-Williams
- Surface treatment: Henkel, Nihon Parkerizing, PPG

Focus of research and development

Our innovation efforts for the automotive industry are focused on close partnerships with our customers in order to formulate, for instance, new coatings solutions for integrated processes and unique eco-efficient coatings. Additional research topics include improved products for new technology markets, such as functional films, and environmentally friendly applications.

Key capabilities of BASF

- Innovative long-term cooperation with leading OEM customers
- Technical on-site support at customer locations, creating additional value and long-term relationships
- Services and tools within automotive industry to deal with color complexity
- Leveraging strong market position and application know-how from mature markets into growing markets
- Global production and market presence

Acquisitions/JVs/investments

from 2019 onward

Product group	Description	Year
Automotive OEM	Waterborne capacity expansion in Tultitlán, Mexico	2019
	Construction of automotive application center in Shanghai, China	2019
	Resin capacity expansion in Caojing, China	2020
	Expansion of e-coat production in Greenville, Ohio	2020
	Spraybooth capacity upgrade in Windsor, Canada	2020
	Upgrade of e-coat application center in Münster, Germany	2021
Refinish	Application center upgrade in Guadalajara, Spain	2022
	Acquisition of UBench BV, Turnhout, Belgium	2019
	New laboratory facility in Münster, Germany	2021
Surface treatment	Capacity expansion in Jiangmen, China	2022
	Capacity increase for Naftoseal® aircraft sealant production in Langelsheim, Germany	2019
	New surface treatment site in Pinghu, China	2021
New business development	New production for functional films in Münster, Germany	2020

Major production sites

BASF Coatings manufactures its products at more than 70 sites worldwide. The most important sites are listed below.

Product group	Site
Automotive OEM	Greenville, Ohio; Guadalajara, Spain; Münster, Germany; Shanghai, China; Tultitlán, Mexico
Refinish	Clermont de l'Oise, France; Jiangmen, China; Münster, Germany; Windsor, Canada
Surface treatment	Blackman Township, Michigan; Boksburg, South Africa; Guissano, Italy; Langelsheim, Germany; Sens, France; Shanghai, China
Decorative paints	Demarchi and Jabotão, Brazil

Innovation



© Lufthansa Technik AG/Sonja Brüggemann

Functional films for improved efficiency

With our FunTex technology for functional films, BASF has developed an innovative approach to surface solutions for various products, applications and industries. Our functional film solutions enhance surface drag, for example in aviation. The riblet structures of Novaflex Sharkskin significantly reduce frictional resistance of aircraft surfaces when flying and make the aircraft up to 3% more fuel-efficient, reducing CO₂ emissions. Similar concepts can also be used for wind energy applications.

Nutrition & Care

In the Nutrition & Care segment, consisting of the Care Chemicals and Nutrition & Health divisions, we serve the growing and increasingly sophisticated demands for fast-moving consumer goods. Our customers include food and feed producers as well as the pharmaceutical, cosmetics, detergent and cleaner industries. We also offer solutions for technical applications and for crop protection and nutrition. We strive to expand our position as a leading provider of ingredients and solutions for consumer goods in the areas of nutrition, home and personal care. Our goal is to drive organic growth. We focus on emerging markets, new business models and sustainability trends in consumer markets, supported by acquisitions.

Divisions

Care Chemicals

Ingredients for the cosmetics, detergent and cleaner industries, agrochemical and technical applications

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Nutrition & Health

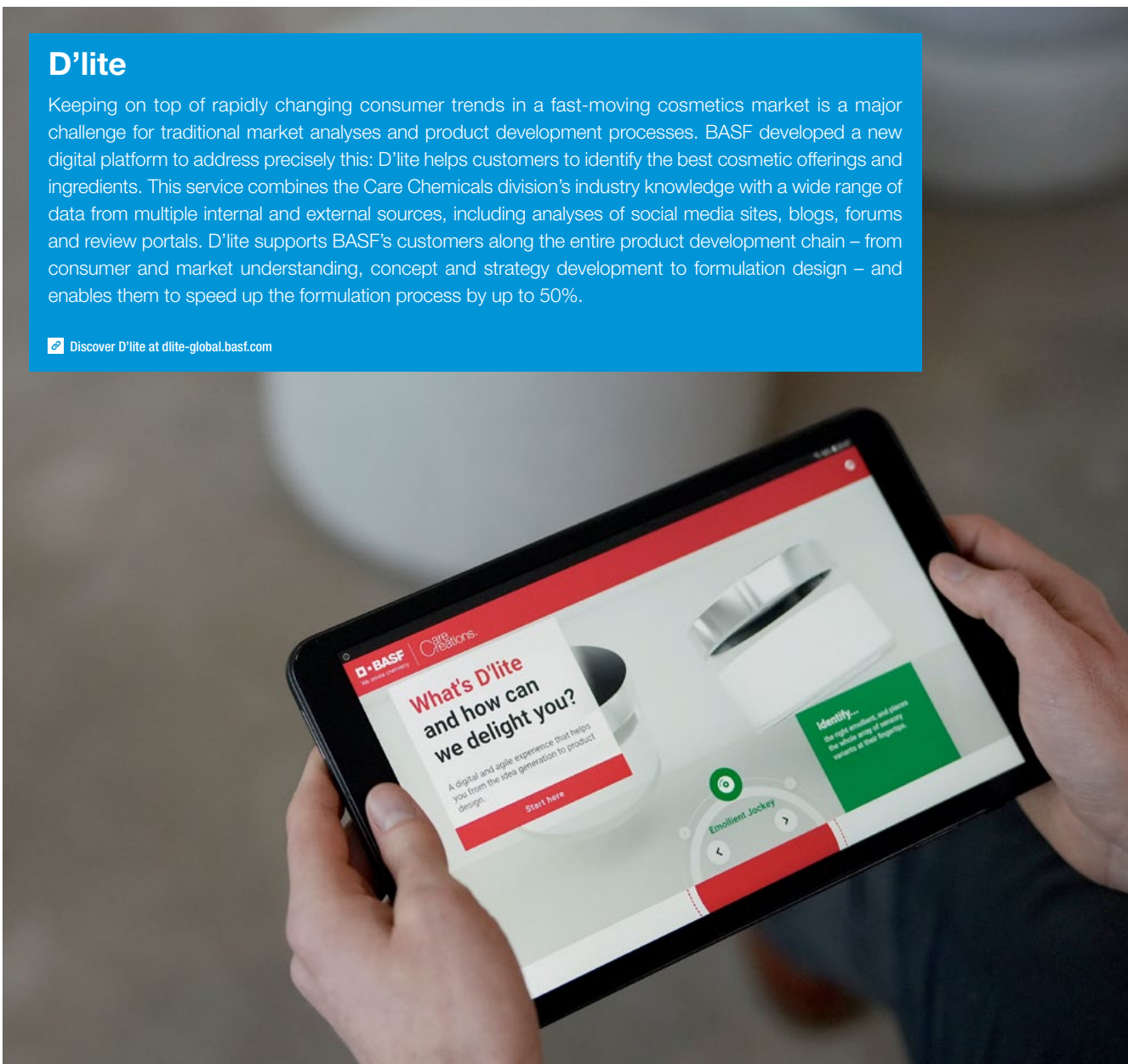
Products for the food and feed industries, the flavor and fragrance industry and the pharmaceutical industry

 page 60

D'lite

Keeping on top of rapidly changing consumer trends in a fast-moving cosmetics market is a major challenge for traditional market analyses and product development processes. BASF developed a new digital platform to address precisely this: D'lite helps customers to identify the best cosmetic offerings and ingredients. This service combines the Care Chemicals division's industry knowledge with a wide range of data from multiple internal and external sources, including analyses of social media sites, blogs, forums and review portals. D'lite supports BASF's customers along the entire product development chain – from consumer and market understanding, concept and strategy development to formulation design – and enables them to speed up the formulation process by up to 50%.

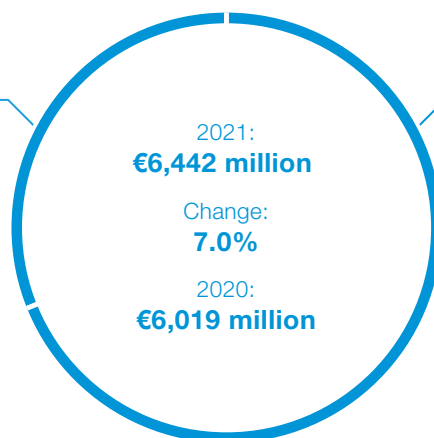
 Discover D'lite at dlite-global.basf.com



Segment Nutrition & Care

Sales

Nutrition & Health €2,003 million
 Change: **-1.3%**
 Share of sales: **31%**



Care Chemicals €4,439 million
 Change: **11.3%**
 Share of sales: **69%**

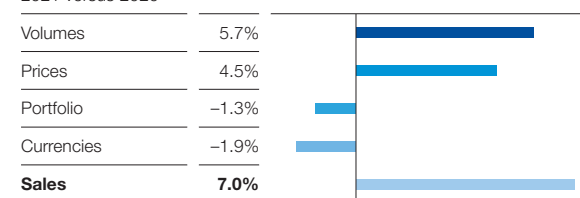
Segment data

Million €

	2021	2020	2019
Sales to third parties	6,442	6,019	6,075
Share of total BASF sales	8	10	10
of which Care Chemicals	4,439	3,989	4,118
Nutrition & Health	2,003	2,030	1,957
Income from operations before depreciation and amortization (EBITDA) before special items	909	1,190	1,214
Income from operations before depreciation and amortization (EBITDA)	967	1,152	1,189
EBITDA margin	15.0	19.1	19.6
Income from operations (EBIT) before special items	497	773	793
EBIT before special items margin	7.7	12.8	13.1
Income from operations (EBIT)	554	688	644
EBIT margin	8.6	11.4	10.6
Return on capital employed (ROCE)	8.2	10.6	10.0

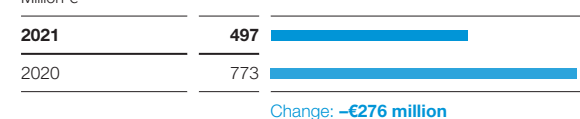
Factors influencing sales

2021 versus 2020



EBIT before special items

Million €



Care Chemicals

BASF's Care Chemicals division is a globally leading supplier to the cosmetics, detergent and cleaner industries. We also offer solutions for technical applications and for crop protection and plant nutrition. Together with our customers, we create innovative solutions to meet the current and future needs of society more sustainably. We contribute to the long-term success of our customers' brands with a broad range of products and concepts via our global network of production and development sites.

Portfolio

Personal care

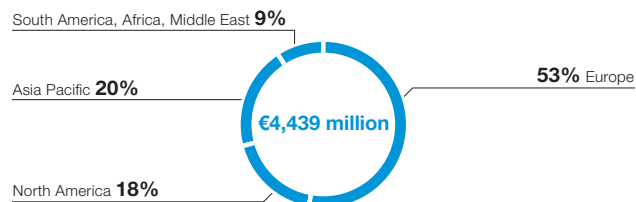
We offer high-quality, added-value and sustainable ingredients for the personal care industry. Our focus on consumer trends and our ability to innovate and bring new products rapidly to market contribute strongly to the success of our customers. We take into consideration the entire value chain in order to develop sustainable solutions. The personal care product range includes surfactants and emulsifiers, polymers, emollients, cosmetic active ingredients and UV filters.

Our business approach draws its inspiration for products and concepts from consumers and society. This is exemplified by our Care Creations® brand which clearly expresses our strengths of scientific excellence, market knowledge and agility, making BASF's personal care business a valued partner for the industry.

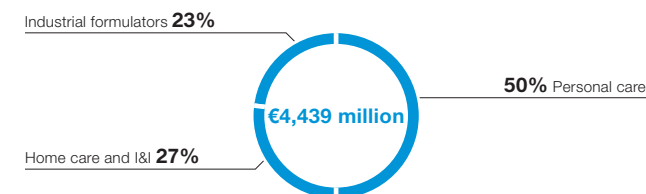
Home care and industrial & institutional cleaning

We develop, produce and market a wide range of ingredients for detergents and cleaning solutions worldwide. As the innovation leader in this market, we offer choices to our customers and provide the best-possible solutions to successfully cater to today's and tomorrow's market needs and changing regulatory requirements. Our strong R&D base and in-depth market and application expertise set us apart from the competition and make us the partner of choice

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



for formulators of efficient, convenient, sustainable and safe-to-use detergents and other cleaning products. Our portfolio, which is constantly being further developed, includes surfactants, enzymes, water-soluble polymers, chelating agents, biocides, optical effect products, stabilizers and methanesulfonic acid.

Industrial formulators

We develop and commercialize a broad portfolio of processing aids, differentiating additives and surface-active building blocks for a wide range of industrial applications and further downstream processing. With our formulation know-how and understanding of the physico-chemical properties of our products, we enable customer-specific solutions. In addition, we market an extensive portfolio of performance enhancers to crop protection and plant nutrition specialists. Our product portfolio includes dispersants, emulsifiers, surface modifiers, solvents, chelating agents, biocides, micronutrients and methanesulfonic acid.

BASF's market position

We are a leading supplier globally for the personal care and home care industries.

- Home care, industrial & institutional cleaning and industrial formulators: No. 2 globally
- Oleo surfactants and alcohols: No. 2 globally
- Personal care specialties: No. 1 globally

Main competitors (alphabetical order)

- Home care, industrial & institutional cleaning and industrial formulators: Clariant, Dow, Nouryon, Novozymes, Sasol, Solvay
- Oleo surfactants and alcohols: Galaxy Surfactants, Stepan, Zanyu Technology
- Personal care specialties: Ashland, Clariant, Croda, DSM, Evonik

Focus of research and development

We are committed to delivering innovative and sustainable products and solutions in close collaboration with customers in our core markets, with a strong focus on bio-based and biodegradable ingredients. With process innovation in our core technologies, we target continuous capacity and yield improvement to ensure competitiveness and shrink carbon footprints to support the sustainability transformation of our customers. We systematically identify and establish new technologies to best support our customers in driving innovation for end consumers.

Key capabilities of BASF

- Customer proximity and industry focus across regions and industries
- Innovative and sustainable solutions through BASF's global R&D network
- State-of-the-art formulation technologies
- Strong global production footprint close to our customers, also in emerging markets

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Alkoxyates	Gradual capacity expansion in Antwerp, Belgium	2018–2022
	Capacity expansion in Jinshan, China	2020
Alkyl polyglucosides	Capacity expansion in Cincinnati, Ohio, and Jinshan, China	2018–2019
Silicates	Plant modernization in Düsseldorf-Holthausen, Germany	2019
Polyacrylates	Capacity expansion in Ludwigshafen, Germany	2019
Pearlizers and opacifiers	Capacity expansion in Mauldin, South Carolina	2020
Methanesulfonic acid	Capacity expansion in Ludwigshafen, Germany	2022
Optical brighteners	Capacity expansion in Monthey, Switzerland	2022
UV filters	New plant in Jinshan, China	2023
Enzymes	Investment in production setup for bacterial enzymes and biotechnology products, Kundl/Schaftenau, Austria ¹	2024

¹ Joint investment with Nutrition & Health division

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
Optical brighteners	Divestiture of stilbene-based optical brightening agents in Ankleshwar, India	2019
Surfactants	Divestiture of anionic surfactants business in Kankakee, Illinois	2021

Major nameplate capacities of BASF

Thousand metric tons per year

Product group	Location	Capacity ¹
Chelating agents	Europe, North America, South America	170
Methanesulfonic acid	Europe	30
Non-ionic surfactants	Europe, North America, Asia Pacific	650
Anionic surfactants	Europe, North America, South America, Asia Pacific	550

¹ All capacities at 100% (including joint ventures)

Innovation



© shutterstock/Yakobchuk Viacheslav

Verdessence™: Biopolymers for personal care

With BASF's new Verdessence™ product line we offer sustainably sourced biopolymers which are biodegradable and bio-based. Two recent launches are Verdessence™ Glucomannan, a cold processable rheology modifier, obtained from the tuber of the konjac plant, suitable for aqueous systems like gels, fluids and serums as well as novel formats such as patches, jellies and peel-off formulations. Verdessence™ Tara is a 100% plant-based rheology modifier that enables the creation of smooth and shapely textures. It is suitable for aqueous and emulsion systems acting as an effective thickener and texture enhancer.

Nutrition & Health

BASF's Nutrition & Health division develops, produces and markets ingredients for the nutrition and health industries. Our products fulfill the highest safety, regulatory and sustainability standards. Together with our customers, we play an active part in enhancing the nutrition and health of consumers all over the world.

Portfolio

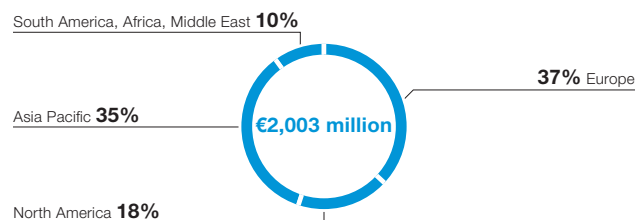
Aroma ingredients

BASF offers a wide variety of aroma ingredients, such as L-menthol, geraniol, citronellol and linalool, which are part of our citral value chain. In 2019, we broadened our portfolio with renewable-based natural ingredients for example, by acquiring Isobionics®. Our aroma ingredients are sold to the flavor and fragrance industry for use mainly in home and personal care products, in fine fragrances and in the food industry:

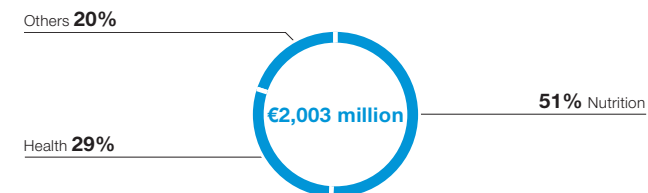
- Rose scents: geraniol, citronellol, dihydrorosan
- Citrus scents: citral, citronellal
- Mint scents: L-menthol, DL-menthol
- Lavender scents: linalool, tetrahydrolinalool
- Muguet scents: lysmeral, pyranol
- Selected sensations: Velberry™ (fruity)
- Isobionics natural flavors (citrus, lemon, orange, grapefruit) and natural fragrance (sandalwood)

Biomass balance BMBcert™ products are available for nearly all standard products of our aroma ingredients portfolio. Biomass balance (BMB) means that renewable resources are used as feedstock at the very beginning of the Production Verbund. The renewable-based feedstock amount is then allocated to specific products using a third party-verified certification method (REDcert²). The certified products show an equally strong product performance, without reformulation, while significantly reducing the CO₂ footprint compared with the standard product. The BMB approach saves fossil resources and reduces greenhouse gas emissions.

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021¹



¹ Aroma ingredients business is included in the customer industries nutrition and others.

Animal nutrition

BASF is one of the leading suppliers of feed additives to the animal protein value chain. The focus is on supplying the feed industry with highly effective products like vitamins, carotenoids, enzymes and organic acids. We offer our customers solutions that reduce greenhouse gas emissions and improve resource efficiency as well as animal wellbeing. Digital technologies increasingly expand our portfolio. Examples include Opteinics™ (software for more sustainable production), trinamiX (mobile NIR spectroscopy solution) and Cloudfarms (pig management system). This makes BASF a leading provider when it comes to future-oriented digital solutions for animal nutrition. Our product portfolio for livestock and companion animals includes:

- Carotenoids
- Conjugated linoleic acid
- Enzymes
- Glycinates
- Monoglycerides
- Mycotoxin binders
- Organic acids
- Vitamins applications

Human nutrition

Our health ingredients are based on a combination of scientific approach, technical and application expertise that contribute to leading healthy and active lifestyles. Used for a wide range of applications in strategic market segments including early life nutrition, dietary supplements, functional nutrition and food colors, our product range comprises:

- Vitamins
- Carotenoids
- Omega-3 natural oils and powders
- Plant sterols
- Conjugated linoleic acid

In our food fortification initiative, our health ingredients help fortify staple foods to combat micronutrient deficiencies across the world. Furthermore, we offer a comprehensive performance ingredient portfolio for the beverage and food industry. Our products are used as stabilizers or colorants in various applications and include:

- Emulsifiers
- Enzymes
- Specialty compounds
- Filtration aids

Pharma solutions

In pharma solutions, we produce innovative excipients and active ingredients of outstanding quality and performance. With digital solutions, such as the Virtual Pharma Assistants, and a global team of industry experts, BASF supports its customers in developing efficient, cost-effective, and reliable formulations. Equipped with an in-depth understanding of multiple technologies and applications, we have the knowledge and resources to make biologics and drug manufacturing as well as delivery safer and more sustainable.

Enzymes

BASF develops, produces and markets a comprehensive selection of high-performance enzymes for a range of industries. By harnessing the power of nature and leveraging our unique, patented technology, we create a broad range of specialty products that meet high-value commercial needs. BASF enzyme solutions are designed to generate revenue in an environmentally sustainable way by maximizing efficiency while improving environmental performance. We offer industrial enzymes for the following markets:

- Animal nutrition
- Bioethanol
- Home care and industrial & institutional solutions

BASF's market position

BASF's Nutrition & Health division is among the top three suppliers in all important product groups worldwide.

Main competitors (alphabetical order)

- Animal nutrition: DSM, IFF, NHU, ZMC
- Aroma ingredients: IFF, NHU, Symrise
- Enzymes: IFF, Novozymes
- Human nutrition: DSM, IFF, Kerry Group, NHU, ZMC
- Pharma solutions: Ashland, Croda, Evonik, Huatai, IOL, KD Pharma, Nippon Suisan Kaisha, Solara

Focus of research and development

Together with our partners, we continuously work on translating ideas into innovations. Ongoing process innovation ensures technological and cost leadership in our major product lines.

Key capabilities of BASF

- Cost leadership through integration into the Verbund
- Value-driven innovation to support customer needs
- Deep understanding of the nutrition and health market
- High expertise in a complex regulatory environment
- Sustainability and quality management

Acquisitions/JVs/investments

From 2019 onward

Product group	Description	Year
Animal nutrition	Acquisition of Cloudfarms, Slovakia	2020
	Expansion of vitamin A production plant in Ludwigshafen, Germany	2021
Aroma ingredients	Acquisition of Isobionics, Netherlands	2019
Enzymes	Capacity expansion of enzyme plant in Ludwigshafen, Germany	2021
	Investment in production setup for bacterial enzymes and biotechnology products, Kundl/Schafftenau, Austria ¹	2024
Pharma solutions	Expansion of PVP value chain: extension of capacities in Ludwigshafen, Germany; Shanghai, China; Geismar, Louisiana	2016–2019
	Expansion of ibuprofen production in Bishop, Texas	2020

¹ Joint investment with Care Chemicals division

Divestitures/shutdowns

From 2019 onward

Product group	Description	Year
Human nutrition	Divestiture of site in Kankakee, Illinois, and associated businesses of vegetable-oil-based pharmaceutical raw material sterols, natural vitamin E, anionic surfactants and esters	2021
Pharma solutions	Divestiture of Kalundborg site, Denmark, Omega-3 production	2020

Innovation



An innovative feed enzyme to unlock valuable nutrients

BASF has launched the new enzyme product Natupulse® TS for animal feed. Natupulse® TS is a non-starch polysaccharide (NSP) enzyme. Adding β-mannanase to animal feed decreases digesta viscosity, thereby increasing the nutrient and energy digestibility and improving feed efficiency. In addition, Natupulse® TS cleaves β-mannans, resulting in manno-oligosaccharides (MOS).

Major production sites

Product group	Site
Animal nutrition	Gunsan, South Korea; Ludwigshafen, Germany; Shenyang, China
Aroma ingredients	Geleen, Netherlands; Kuantan, Malaysia; Ludwigshafen, Germany
Human nutrition	Ballerup, Denmark; Boussens, France; Cheltenham, Hutt Lagoon and Whyalla, Australia; Gunsan, South Korea; Illertissen and Ludwigshafen, Germany
Pharma solutions	Bishop, Texas; Callanish, United Kingdom; Sandefjord, Norway

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 products to help farmers achieve 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.

Luximo®: novel herbicide active ingredient

Luximo® controls a broad range of resistant and difficult-to-control grass weeds in wheat and other cereal crops. It is the first herbicide since 1985 to receive a new mode of action classification from the global industry organization HRAC.¹ With more than 50% carbon content of the active ingredient coming from renewable sources and no known cross-resistance, Luximo® offers farmers in Australia and, in the future, in the E.U. and U.K. a new solution for sustainable weed resistance management. We anticipate a peak sales potential² for this product in the low three-digit million euro range.

 Discover Luximo® at basf.com/luximo



¹ Herbicide Resistance Action Committee

² Peak sales describes the highest sales value to be expected in one year.

Segment Agricultural Solutions

Sales

Seeds & Traits €1,641 million
Change: **10%**
Share of sales: **20%**

Seed Treatment €620 million
Change: **2%**
Share of sales: **8%**

Insecticides €926 million
Change: **12%**
Share of sales: **11%**

2021:
€8,162 million

Change:
6.6%

2020:
€7,660 million

Fungicides €2,449 million
Change: **8%**
Share of sales: **30%**

Herbicides €2,526 million
Change: **3%**
Share of sales: **31%**

Segment data

Million €

	2021	2020	2019
Sales to third parties	8,162	7,660	7,814
Share of total BASF sales	% 11	13	13
Income from operations before depreciation and amortization (EBITDA) before special items	1,375	1,680	1,809
Income from operations before depreciation and amortization (EBITDA)	1,358	1,582	1,647
EBITDA margin	% 16.6	20.7	21.1
Income from operations (EBIT) before special items	715	970	1,095
EBIT before special items margin	% 8.8	12.7	14.0
Income from operations (EBIT)	696	582	928
EBIT margin	% 8.5	7.6	11.9
Return on capital employed (ROCE)	% 4.5	3.6	5.3

Factors influencing sales

2021 versus 2020

Volumes	8.1%	
Prices	2.5%	
Portfolio	-	
Currencies	-4.0%	
Sales	6.6%	

EBIT before special items

Million €

2021	715
2020	970

Change: **-€255 million**

Agricultural Solutions

Farming is fundamental to provide enough healthy and affordable food for a rapidly growing population while reducing environmental impacts. Working with partners and agricultural experts and by integrating sustainability criteria into all business decisions, we help farmers to create a positive impact on sustainable agriculture. At BASF, we believe that the way forward for agriculture is to find the right balance – for farmers, agriculture and future generations.

Portfolio

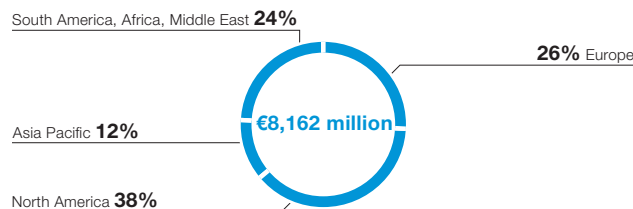
Our innovation-driven strategy for agriculture focuses on selected crop combinations, known as crop systems: soy, corn (maize) and cotton in the Americas; wheat, canola (oilseed rape) and sunflowers in North America and Europe; rice in Asia; and fruit and vegetables globally. We steer our portfolio, including seeds and traits, seed treatment, biological and chemical crop protection, and digital farming solutions, for farmers and the agricultural industry toward sustainable solutions.

Field crop seeds & traits

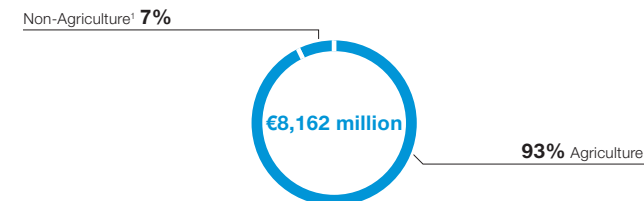
Research capabilities for traits and breeding, as well as corresponding seed brands:

- InVigor® canola (oilseed rape) sold in North America, Europe and Australia offers high yielding hybrids. In North America, InVigor® is also combined with the LibertyLink® trait, enabling weed management and pod-shatter resistance, facilitating greater harvest flexibility and reducing risk due to storm losses.
- FiberMax® and Stoneville® cotton, available with herbicide tolerance and insect resistance trait brands LibertyLink®, GlyTol®, TwinLink® and TwinLink® Plus, brings value with yield and high-quality fiber.

Sales by region 2021 (location of customer)



Sales by direct customer industry 2021



¹ Aquaculture, forestry, home and garden, industrial weed control, ornamentals, public health, turf, urban pest control

- Credeenz® soybean seed, based on leading germplasm and traits, such as LibertyLink GT27, helps to minimize local weed, pest and disease pressure and fight resistance.

Vegetable seeds

Developing solutions to make healthy eating enjoyable and sustainable, by creating improved varieties through conventional breeding and working closely with partners throughout the value chain. Under the Nunhems® brand, BASF markets more than 1,200 vegetable varieties for 24 crops.

- In 2021, Vegetable Seeds, together with chain partners Sunions™, brought the first tearless onion to consumers in France, Germany, Italy and the United Kingdom.

Fungicides

Conducting pioneering research to find new active ingredients and provide our customers new options to control fungal diseases:

- Xemium® is a key component of BASF's fungicides portfolio due to its broad-spectrum disease control. It has excellent mobility in the plant and long-lasting residual action. Xemium® is available in more than 70 countries for over 140 different crops.
- Revysol® is our latest compound. It meets the highest level of regulatory standards and offers outstanding biological perfor-

mance against difficult-to-control pathogens in specialty and row crops. The active ingredient has received registrations in all regions. Revysol®-based products have been introduced globally in all major crops.

Herbicides

Reducing competition from weeds secures yield and harvest quality, enabling no-till farming practices:

- Luximo®, with no known cross-resistance, provides soil residual control against a broad range of grasses in cereal crops.
- Tirexor® is utilized for the burndown and residual control of broad-leaf weeds and certain grasses. It is the first new mode of action for the burndown of grass weeds in 20 years.
- Liberty® and Basta® herbicides, glufosinate ammonium-based, control weeds in a number of row and specialty crops. Liberty® is designed for LibertyLink®-enabled row crops, while Basta® is effective on hard-to-control weeds in horticulture.

Insecticides

Combating insect pests in agriculture and beyond:

- Inscalix®¹ insecticide offers an alternative mode of action for the control of piercing-sucking insects such as aphids, whiteflies, and leafhoppers in row and specialty crops and ornamentals.

¹ Co-developed with Meiji Seika Pharma Co. Ltd

Innovation



© Loop Propaganda, Brazil

Pingo Doce™ watermelons

BASF tapped the Brazilian market with Pingo Doce™ watermelons, introducing not only high-quality seeds but also a new business model. BASF provides technical support to farmers and demonstrates best practices in efficient water management, fertilization and traceability to establish sustainable production. Regular quality controls are carried out to check the sweetness, color and size of the watermelons in order to reduce the amount of fruit rejected by supermarkets. This new approach delivers a product that benefits farmers, consumers and the environment alike.

- Axalion™ insecticide, developed by BASF, is a novel mode of action compound for the control of piercing and sucking insects, including whiteflies and aphids in specialty and row crops and ornamentals. The first dossier submissions have been successfully filed in Australia, Brazil, the European Union, Great Britain, India and South Korea. Further dossier submissions throughout Asia, South America and EMEA are in preparation.
- Broflanilide[®],¹ with a novel mode of action, is highly efficacious against caterpillars and beetles in specialty and field crops. It also combats ants, cockroaches and flies in the professional pest management market.

¹ Co-developed with Mitsui Chemicals Agro, Inc.

Seed treatment

Biological and chemical products, functional coatings and colorants to improve seed performance:

- Poncho®/Votivo® is a systemic insecticide and biological seed treatment for use on a wide range of crops to control insect pests and protect against soil plant pathogenic nematodes.
- ILEVO® seed treatment for soybeans provides broad-spectrum nematode protection against soybean sudden death syndrome and cyst nematode, two of the top yield robbers.

Digital farming

With xarvio® Digital Farming Solutions, we enable precision farming to help more than 6.5 million growers globally optimize crop yield using fewer natural resources and crop inputs.

- Together with Bosch, we developed the Smart Spraying solution. This technology recognizes weeds and allows precise application of herbicides, maximizing productive land-use and reducing environmental impact.

BASF's market position

- Agricultural solutions: No. 4 globally, with leading positions in fungicides, herbicides, seed treatment and digital solutions and a strong footprint in Europe and the Americas

Main competitors (alphabetical order)

- Agricultural solutions: Bayer, Corteva, FMC, Syngenta

Research and development

With an estimated peak sales potential of more than €7.5 billion, our innovation pipeline comprises products and solutions across all business areas. Throughout the next decade, we will launch major

projects, including further products based on Revysol® fungicide and digital farming solutions based on the agronomic intelligence of xarvio®. We spent about about €900 million on R&D in the Agricultural Solutions segment in 2021, representing around 11% of the segment's sales.

Key capabilities of BASF

- Strong customer orientation with a comprehensive offer for strategic crop systems
- Strengthened R&D pipeline for sustainable agriculture helping farmers balance environmental and economic challenges as well as meeting consumers' demand for more sustainably produced food
- Stringent patent management
- Innovative digital farming solutions
- Strong integration into the Production and Know-How Verbund

Selected acquisitions/JVs/investments/divestitures

From 2019 onward

Product group	Description	Year
Seeds	Divestiture of HILD Samen business to Graines Voltz	2020
	Expansion of tomato breeding facilities	2021
	Acquisition of melon breeding company ASL	2023
Crop protection/active ingredients	Streamlining of global glufosinate-ammonium production network	2020
	Acquisition of proprietary technology for L-glufosinate-ammonium from AgriMetis™	2020
	Divestiture of active ingredient for control of plant-parasitic nematodes to Mitsui Chemicals Agro	2021
Formulation capacities	New formulation capacities for glufosinate-ammonium (United States, Europe, Asia)	2020
	New production facility for seed treatment formulations (United States)	2020
	New formulation facility in Singapore	2022
Digital farming	Founding of BOSCH BASF Smart Farming GmbH	2021

Other

Activities that are not allocated to any of the divisions are recorded under Other. These include other businesses which comprise commodity trading, engineering and other services, as well as rental income and leases. Discontinued operations and certain activities remaining after divestitures are also reported here.

The following activities are also presented under Other:

- The steering of the BASF Group by corporate headquarters.
- Cross-divisional corporate research, which includes long-term topics of strategic importance to the BASF Group.
- Results from currency translation that are not allocated to the segments; earnings from the hedging of raw materials prices and foreign currency exchange risks; and gains and losses from the long-term incentive programs (LTI programs).
- Remanent fixed costs resulting from organizational changes or restructuring; function and region-related restructuring costs not allocated to a division; idle capacity costs from internal human resource platforms; and consolidation effects that cannot be allocated to the divisions.

Sales in Other rose by €1,306 million compared with 2020 to €3,666 million. This was mainly the result of higher sales in commodity trading.

At –€761 million, **EBIT before special items** in Other was €8 million above the prior-year figure. **EBIT** in Other improved by €444 million year on year, from –€1,203 million to –€759 million. This resulted mainly from miscellaneous income and expenses, which included special income from the partial release of provisions for the restructuring of the Global Business Services unit. In the previous year, special charges had been recognized.

Financial data – Other¹

Million €

	2021 ²	2020	+/-
Sales	3,666	2,360	55.3%
Income from operations before depreciation, amortization and special items	–607	–609	0.3%
Income from operations before depreciation and amortization (EBITDA)	–602	–1,032	41.7%
Depreciation and amortization ³	157	171	–8.2%
Income from operations (EBIT)	–759	–1,203	36.9%
Special items	3	–434	.
EBIT before special items	–761	–769	1.0%
of which costs for cross-divisional corporate research	–355	–364	2.5%
costs of corporate headquarters	–255	–214	–19.2%
other businesses	62	143	–56.6%
foreign currency results, hedging and other measurement effects	–62	–58	–6.9%
miscellaneous income and expenses	–151	–276	45.3%
Assets ⁴	23,007	24,131	–4.7%
Investments including acquisitions ⁵	183	156	17.0%
Research and development expenses	378	385	–1.8%

¹ Information on the composition of Other can be found in the BASF Report 2021 from page 214 onward.

² BASF's ethylene value chain was reorganized 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 2021 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. For more information, see [basf.com/q12022](https://www.basf.com/q12022)

³ Depreciation and amortization of property, plant and equipment and intangible assets (including impairments and reversals of impairments)

⁴ Contains assets of businesses recognized under Other as well as reconciliation to assets of the BASF Group

⁵ Additions to property, plant and equipment and intangible assets

Non-Integral Shareholding in Wintershall Dea

With the merger of Wintershall Holding GmbH and DEA Deutsche Erdoel AG in May 2019, two successful companies with a long tradition formed Europe's leading independent natural gas and oil company: Wintershall Dea.

The company with German roots and headquarters in Kassel and Hamburg explores for and produces gas and oil in 13 countries worldwide in an efficient and responsible manner. With activities in Northern Europe, Russia, Latin America and the MENA region (Middle East and North Africa), Wintershall Dea has a global upstream portfolio. Furthermore, with its participation in natural gas transport, it is also active in the midstream business.

Wintershall Dea stands for over 120 years of experience as an operator and project partner along the entire E&P value chain. The company employs around 2,500 people worldwide from almost 60 nations.

The merger and the shareholders of Wintershall Dea

Following the approval of all relevant authorities, BASF and LetterOne successfully completed the merger of Wintershall and DEA on May 1, 2019. BASF initially held 67% and LetterOne 33% of Wintershall Dea's ordinary shares, reflecting the value of the respective exploration and production businesses of Wintershall and DEA. To reflect the value of Wintershall's gas transportation business, BASF received additional preference shares. On May 1, 2022, these preference shares were converted into ordinary shares of Wintershall Dea, resulting in BASF having a total shareholding in Wintershall Dea of 72.7%.

Key financials of Wintershall Dea

Million €	2021	2020
Revenues and other income	8,188	3,892
EBITDAX ¹	3,832	1,643
Adjusted net income ²	950	195

- EBITDAX is defined as revenues and other income, less production and operating expenses, less production and similar taxes, less general and administrative expenses and less cost of sales midstream, adjusted for special items.
- Adjusted net income is derived from EBITDAX less depreciation and amortization, less exploration expenses, plus financial income, less financial expenses and less income taxes, adjusted for special items and tax effects on adjusted special items and disregarded items (e.g., impairments on assets).

Operating and financial performance of Wintershall Dea

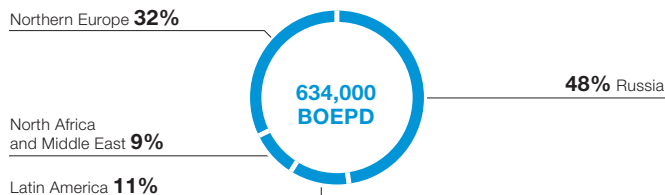
In 2021, Wintershall Dea had revenues and other income of €8.2 billion, income from operations before depreciation, amortization and exploration (EBITDAX) of €3.8 billion and adjusted net income of €950 million. Total production of Wintershall Dea (excluding Libya onshore) was 634,000 barrels of oil equivalent per day (BOEPD). As of December 31, 2021, proven and probable reserves stood at 3.4 billion barrels of oil equivalent (BOE), corresponding to a reserve to production ratio of 15 years.

Germany

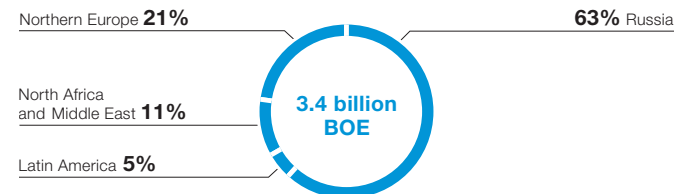
In Germany, Wintershall Dea has been active in the exploration and production business for more than nine decades. Wintershall Dea

Wintershall Dea

Production 2021 by region



Proven reserves (2P) 2021 by region



Activities by region



has now concentrated its production to the Mittelplate and Emlichheim oil fields and the Völkersen gas field. Production in Germany requires particular expertise, which the company can apply in its operations globally. The company's operations in Mittelplate are considered exemplary and regarded internationally as a benchmark for safe oil production in an environmentally sensitive area. Concessions in the South of Germany and smaller participations in other licenses have been divested in the course of portfolio optimization measures. Wintershall Dea is actively engaged in the energy transition and is pursuing hydrogen prototype projects with partners to meet its climate targets.

Norway

Norway is Europe's most important supplier of natural gas and oil besides Russia. Wintershall Dea has operated on the Norwegian continental shelf for almost 50 years and is now one of the leading

oil and gas companies there. Wintershall Dea currently participates in 96 licenses, in 31 of them as operator. The portfolio in Norway consists of a large number of producing assets in different life cycles, including key development projects Nova, Dvalin and Njord.

Netherlands

Wintershall Dea has been active in the Dutch North Sea for more than 50 years. As a shareholder of Wintershall Noordzee, the company is currently one of the major producers of natural gas in the region.

Denmark

Wintershall Dea has been producing oil successfully off the coast of Denmark since 2003. Today, Wintershall Dea has equity in the two oil fields Cecilie and Nini which are located in the Danish Central Graben and expected to remain in production until 2024. Further, Wintershall Dea draws on the potential of CO₂ storage technologies for a cleaner energy future as one of the core members of the Project Greensand Consortium.

United Kingdom

Wintershall Dea holds six concessions off the British coast as a shareholder of the operator Wintershall Noordzee. The most important projects in the British North Sea are the self-operated natural gas field Wingate, discovered in 2008, and the Silliminate field, which is partly in the Dutch North Sea.

Russia

Wintershall Dea is involved in the production and development of hydrocarbons in Western Siberia. On March 2, 2022, Wintershall Dea AG's Management Board decided not to advance or implement any additional gas and oil production projects in Russia. Wintershall Dea's existing onshore projects in Russia include the Urengoyskoye field – one of the world's largest gas and condensate reserves – which is located near the Western Siberian city of Novy Urengoy. There, the Achimgaz joint project produces natural gas from the technically complex Achimov Formation. Another joint venture, Achim Development, is developing blocks 4A and 5A and production has started in 2021. In the Yamalo-Nenets Autonomous Okrug

is the Yuzhno-Russkoye field, in which Wintershall Dea has a stake via the Severneftegazprom joint venture.

Argentina

Wintershall Dea has been active in Argentina for more than 40 years. Today, the company has a stake in about 20 onshore and offshore fields, all of them non-operated. In the southern part of the country, Wintershall Dea together with TotalEnergies and Pan American Energy, is active in the offshore concession Cuenca Marina Austral 1 (CMA-1) contributing approximately 16% of total domestic gas production in Argentina. In the Neuquén province, Wintershall Dea participates in conventional production as well as in production from the highly prolific Vaca Muerta shale from the Aguada Pichana Este and San Roque blocks.

Mexico

Mexico has some of the world's largest proven reserves. After entering the country's oil and gas market in 2017, Wintershall Dea established a major position there in just one year. This includes being operator of the producing onshore Ogarrio oil field and partner in the offshore development Zama. The company also holds shares in exploration licenses and made two promising discoveries.

Brazil

As part of its continuous portfolio development, Wintershall Dea has decided to terminate all its operations in Brazil in the course of 2022.

Egypt

Wintershall Dea has been active in Egypt for over 45 years. Currently it operates in the onshore Nile Delta, where Wintershall Dea was awarded a new exploration license in 2019. It is also a partner in the major West Nile Delta project, where five fields are now in production, most recently Raven, which started production in February 2021.

Libya

Through its affiliate Wintershall Aktiengesellschaft (WIAG), Wintershall Dea participates in crude oil production from nine oil fields across contract areas 91 (former concession 96) and 107 (former conces-

sion 97) in the Eastern Sirte Basin. After 54 years of own operatorship, WIAG in October 2020 handed over operatorship of contract areas 91 and 107 to Sarir Oil Operations, a joint venture between NOC (51%) and WIAG (49%) that has been established following the conversion of the former concession agreements to the EPSC contractual standard. Wintershall Dea also holds a minority stake in offshore oil production from Al-Jurf offshore platform in contract areas 15, 16 and 32 (former block C137).

Algeria

Wintershall Dea has been active in Algeria since 2002 and is currently producing from the Reggane Nord project. Algeria has significant energy potential. The country is the third-largest exporter of gas to Europe after Russia and Norway, and is the largest natural gas producer in Africa. Wintershall Dea continues to strengthen its presence in Algeria. As of May 4, 2022, the company has entered into a sale and purchase agreement to acquire Edison's 11.25% participating interest in the Reggane Nord natural gas project. After the transaction is closed, the consortium Groupement Reggane Nord (GRN), operator of the project, will comprise Sonatrach (40%), Wintershall Dea (30.75%) and Repsol (29.25%).

United Arab Emirates

The United Arab Emirates have the seventh-largest oil reserves in the world. Wintershall Dea has been active in the country since 2010. In 2018, the national oil company ADNOC awarded it a 10% stake in the Ghasha concession. Ghasha is one of the most promising gas and condensate projects that has yet to be developed in the Emirates. The Ghasha concession offshore Abu Dhabi consists of several major gas and condensate development projects in different phases over the 40-year concession period.

3

Financials

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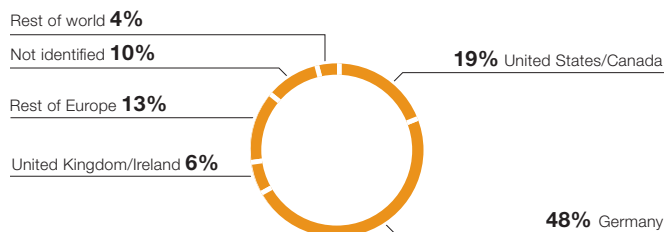
BASF on the Capital Market

Broad base of international shareholders

With over 800,000 shareholders, BASF is one of the largest publicly owned companies with a high free float. An analysis of the shareholder structure carried out at the end of 2021 showed that, at around 19% of share capital, the United States and Canada made up the largest regional group of institutional investors. Institutional investors from Germany accounted for around 9%. Institutional investors from the United Kingdom and Ireland hold 6% of BASF shares, while investors from the rest of Europe hold a further 13% of capital. Approximately 39% of the company's share capital is held by private investors, nearly all of whom reside in Germany. BASF is therefore one of the DAX companies with the largest percentage of private shareholders.

Shareholder structure

By region, rounded



Employees becoming shareholders

In many countries, we offer share purchase programs that turn our employees into BASF shareholders. In 2021, for example, around 23,600 employees (2020: around 27,600) purchased BASF shares worth €38.2 million (2020: €61.1 million).

BASF – a sustainable investment

BASF has participated in the program established by the international organization CDP (formerly the Carbon Disclosure Project) for reporting on data relevant to climate protection since 2004. CDP represents over 590 investors with over \$110 trillion in assets and more than 200 major organizations with \$5.5 trillion in purchasing power. In 2021, BASF again scored an A– on CDP's Climate List, giving it Leadership status. In the scoring framework used by CDP in 2021, BASF was ranked among the top third of participating chemical companies.

BASF was rated A– in the CDP assessment for sustainable water management. The assessment takes into account how transparently companies report on their water management activities and how they reduce risks such as water scarcity. CDP also evaluates the extent to which product developments can contribute to sustainable water management for customers of the companies assessed. BASF continues to implement its sustainable water management target at all relevant production sites (Verbund sites and sites in water stress areas).

BASF participated in the CDP's "Forests" assessment for the second time in 2021 and was ranked A–, as in the previous year. As a participant in various value chains, BASF is committed to ending deforestation in these supply chains. Consequently, BASF is one of the companies with Leadership status, as for climate protection and water management.

BASF maintained its Prime status in the ISS ESG rating developed by Institutional Shareholder Services and is among the top 7% of the companies assessed. BASF received special recognition for addressing key sustainability issues such as environmental management, energy efficiency and business ethics with a comprehensive set of measures and processes.

In Sustainalytics' ¹ ESG Risk Ratings, BASF is ranked among the top 10% of companies in diversified chemicals. It was commended for the fact that its sustainability targets are reflected in the compensation for the Board of Executive Directors, underlining strong overall management of environmental, social and governance matters.

BASF was again recognized as a Global Compact LEAD company by the U.N. Global Compact in 2021. BASF consistently supports the U.N. Global Compact and its 10 principles of responsible business conduct and the Sustainable Development Goals.

BASF was among the top 10% in the World Benchmarking Alliance's (WBA) Food and Agriculture Benchmark, which assessed 350 companies from the food and agricultural sector on sustainable business practices.

BASF share performance

The BASF share closed the 2021 stock market year at €61.78, a decrease of 4.5% compared with the previous year's closing price (€64.72). BASF's share price reached an annual high of €72.61 in March 2021 before declining over the course of the year despite continued positive business performance. This was due to factors such as the composition of the segments' earnings contributions. Share price development was also negatively impacted by market expectations regarding the future development of margins in the basic chemicals business.

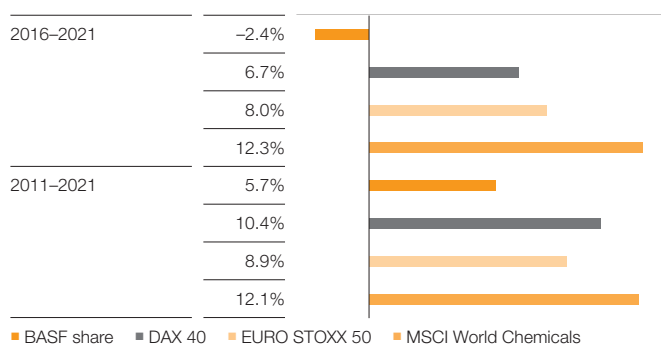
¹ Sustainalytics provides institutional investors and companies with ESG and corporate governance research, ratings and analytics.

Assuming that dividends were reinvested, BASF's share performance rose by 0.2% in 2021. The benchmark indexes of the German and European stock markets – the DAX 40 and the EURO STOXX 50 – rose by 15.8% and 23.3% over the same period, respectively. The global industry index MSCI World Chemicals gained 21.7%.

The assets of an investor who invested €1,000 in BASF shares at the end of 2011 and reinvested the dividends in additional BASF shares would have increased to €1,733 by the end of 2021. This represents an annual yield of 5.7%.

Long-term performance of BASF shares compared with indexes

Average annual increase with dividends reinvested



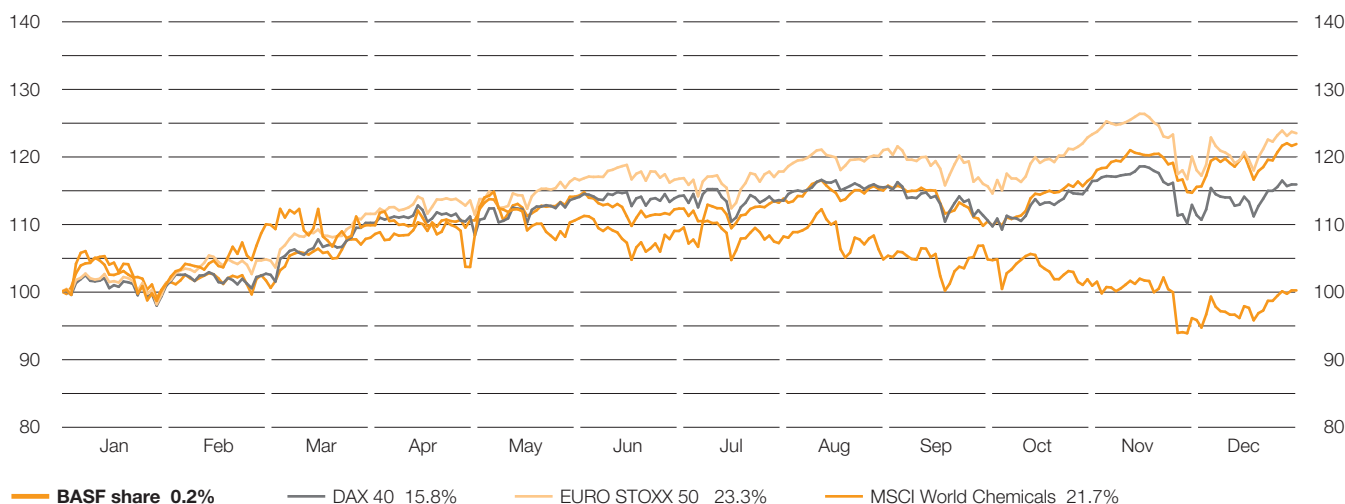
American depositary receipts

American depositary receipts (ADRs) allow U.S. institutional and retail investors to trade and own non-U.S. companies directly through the U.S. equity markets. BASF has a sponsored level 1 program, which is traded on OTC-QX, the platform for international quality companies on OTC markets. BASF's ADR (Symbol: BASFY) is part of the OTC-QX30 index, which comprises the 30 largest ADR programs listed on OTC markets.

For further information, please see [basf.com/share](https://www.basf.com/share)

Change in value of an investment in BASF shares in 2021

With dividends reinvested; indexed



Shareholder return

		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Dividends	million €	2,388	2,480	2,572	2,664	2,755	2,847	2,939	3,031	3,031	3,072
Dividend per share	€	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.30	3.30	3.40
Share price at year-end	€/share	71.15	77.49	69.88	70.72	88.31	91.74	60.40	67.35	64.72	61.78
Dividend yield ¹	%	3.7	3.5	4.0	4.1	3.4	3.4	5.3	4.9	5.1	5.5
Payout ratio	%	50	52	50	67	68	47	63	36	.	57
Price-earnings ratio (P/E ratio)		13.6	14.8	12.5	16.3	20.0	13.9	11.8	7.3	.	10.3
Free cash flow yield ²	%	4.0	4.5	2.6	5.6	4.4	5.7	7.3	5.9	3.8	6.5

¹ Based on year-end share price

² Free cash flow per share at year-end divided by share price at year-end

Analysts' recommendations

Around 30 financial analysts regularly publish studies on BASF. The latest analyst recommendations for our shares as well as the average target share price ascribed to BASF by analysts can be found online at [basf.com/analystestimates](https://www.basf.com/analystestimates).

Dividend

For 2021, BASF paid a dividend of €3.40 per share and paid out €3.1 billion to its shareholders. Based on the year-end share price for 2021, BASF shares offer a high dividend yield of around 5.5%. BASF is part of the DivDAX share index, which contains the 15 companies with the highest dividend yield in the DAX 40.

Dividend per share

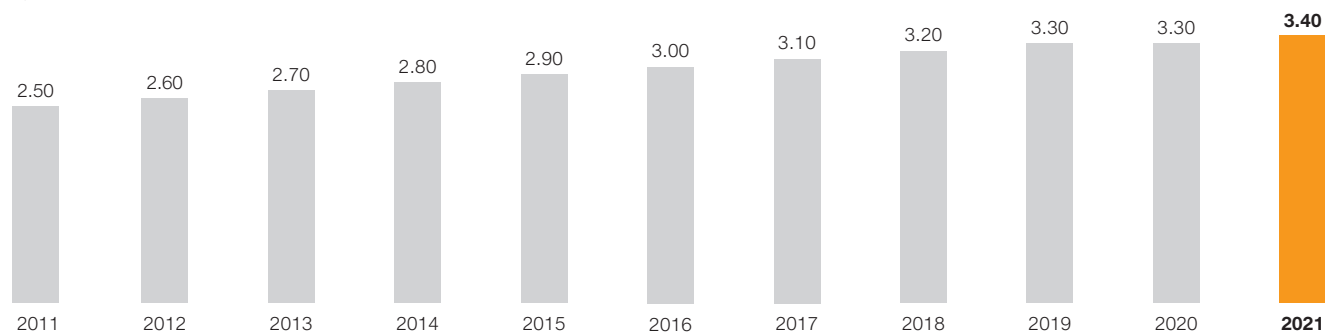
€3.40

Dividend yield

5.5%

Dividend per share

€ per share



Dividend policy:

We aim to increase the dividend per share every year.

Share buyback program of up to €3 billion

In addition to its progressive dividend policy, share buybacks are another tool that BASF uses to create value for its shareholders. In light of the positive business development and the gains on divestitures in the course of 2021, the Board of Executive Directors of BASF SE resolved on a share buyback program on January 4, 2022. The program amounts to up to €3 billion, started on January 11, 2022, and shall be concluded by December 31, 2023, at the latest. BASF SE will cancel all repurchased shares and reduce the share capital accordingly.

The share buyback program was started on the basis of the authorization by the Annual Shareholders' Meeting of BASF SE on May 12, 2017 authorizing the Board of Executive Directors to purchase up to 10% of the issued shares at the time of the resolution until May 11, 2022. A new authorization to buy back own shares

up to April 28, 2027 was granted by the Annual Shareholders' Meeting of BASF SE on April 29, 2022.

Close dialog with the capital market

Our corporate strategy aims to create long-term value. We support this strategy through regular and transparent communication with the capital market. In light of the coronavirus pandemic, we almost exclusively used virtual formats such as video or conference calls for dialog in 2021. We engage with institutional investors and rating agencies in numerous one-on-one meetings, as well as at roadshows and conferences worldwide, and give private investors an insight into BASF at informational events.

Analysts and investors have confirmed the quality of our financial market communications. For instance, we were again named "Best IR" in the materials sector in the annual survey conducted by Britain's IR Magazine.

Further information on BASF share

Securities code numbers

Germany	BASF11
United States (CUSIP number)	055262505
ISIN International Securities Identification Number	DE000BASF111

International ticker symbols

Deutsche Börse	BAS
Pink Sheets / OTCQX	BASFY (ADR)
Bloomberg (Xetra trading)	BAS GY
Reuters (Xetra trading)	BASFn.DE

Business Review by Segment

Segment overview

Million €

	Sales		EBITDA before special items		EBITDA		EBIT before special items	
	2021	2020	2021	2020	2021	2020	2021	2020
Chemicals	13,579	8,071	3,842 ¹	1,305	3,882 ¹	1,237	3,092 ¹	445
Materials	15,214	10,736	3,208	1,714	3,162	1,556	2,418	835
Industrial Solutions	8,876	7,644	1,343	1,189	1,344	1,099	1,006	822
Surface Technologies	22,659	16,659	1,277	966	1,243	900	800	484
Nutrition & Care	6,442	6,019	909	1,190	967	1,152	497	773
Agricultural Solutions	8,162	7,660	1,375	1,680	1,358	1,582	715	970
Other	3,666	2,360	-607 ¹	-609	-602 ¹	-1,032	-761 ¹	-769
BASF Group	78,598	59,149	11,348	7,435	11,355	6,494	7,768	3,560

Segment overview

Million €

	EBIT		Assets		Investments including acquisitions ²		Research and development expenses	
	2021	2020	2021	2020	2021	2020	2021	2020
Chemicals	3,115 ¹	-192	10,482 ¹	7,896	1,157	871	97	96
Materials	2,345	-109	11,286	9,118	709	1,957	193	182
Industrial Solutions	965	630	6,302	6,402	361	331	175	177
Surface Technologies	761	-587	13,769	11,691	1,469	585	296	246
Nutrition & Care	554	688	7,231	6,214	654	510	172	160
Agricultural Solutions	696	582	15,305	14,840	347	459	904	840
Other	-759 ¹	-1,203	23,007 ¹	24,131	183	156	378	385
BASF Group	7,677	-191	87,383	80,292	4,881	4,869	2,216	2,086

¹ BASF's ethylene value chain was reorganized 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 figure has been adjusted accordingly. For more information, see [basf.com/q12022](https://www.basf.com/q12022)

² Additions to property, plant and equipment (of which from acquisitions: €332 million in 2021 and €559 million in 2020) and intangible assets (of which from acquisitions: €392 million in 2021 and €691 million in 2020)

Regional Results

Sales by location of company

Million €

	2012 ¹	2013	2014	2015	2016	2017 ²	2018	2019	2020	2021
Europe	41,445	43,335	42,854	38,675	27,221	28,045	27,526	25,706	24,223	31,594
North America	14,441	14,573	15,467	15,665	14,682	15,937	15,900	16,420	16,440	21,935
Asia Pacific	11,694	11,679	11,643	11,712	11,512	13,658	13,454	13,384	14,895	20,632
South America, Africa, Middle East	4,549	4,386	4,362	4,397	4,135	3,583	3,340	3,806	3,591	4,437
BASF Group	72,129	73,973	74,326	70,449	57,550	61,223	60,220	59,316	59,149	78,598

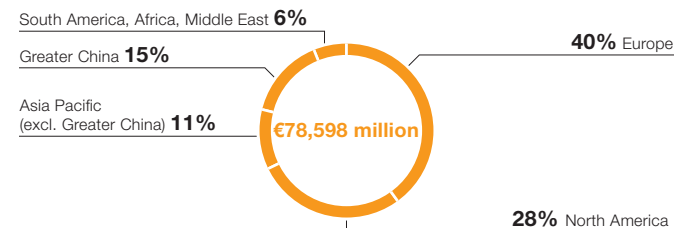
Sales by location of customer

Million €

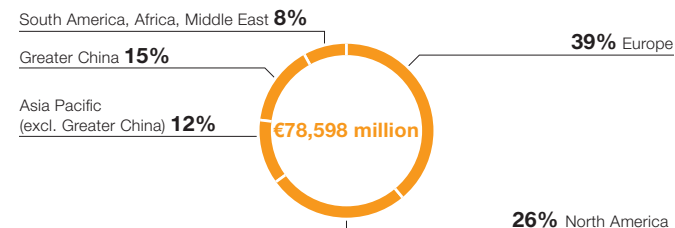
	2012 ¹	2013	2014	2015	2016	2017 ²	2018	2019	2020	2021
Europe	39,428	41,221	40,911	36,897	26,039	26,507	25,589	23,827	23,129	30,531
North America	13,992	14,272	15,213	15,390	14,042	15,357	15,388	15,948	15,709	20,867
Asia Pacific	12,546	12,450	12,341	12,334	12,165	14,343	14,210	14,203	15,406	21,234
South America, Africa, Middle East	6,163	6,030	5,861	5,828	5,304	5,016	5,033	5,338	4,905	5,965
BASF Group	72,129	73,973	74,326	70,449	57,550	61,223	60,220	59,316	59,149	78,598

¹ We have applied International Reporting Standards IFRS 10 and 11 as well as International Accounting Standard 19 (revised) since January 1, 2013. Figures for 2012 have been restated.
² Figures for 2017 were restated with the presentation of the oil and gas activities as discontinued operations.

Sales by location of company 2021



Sales by location of customer 2021



Factors Influencing Sales and Currency Impact

Factors influencing sales of the BASF Group

Million €

	2012 ³	2013 ²	2014	2015	2016	2017	2018 ¹	2019	2020	2021
Volumes	1%	5%	4%	3%	2%	4%	1%	-3%	-1%	10.6%
Prices	1%	0%	-3%	-9%	-4%	8%	4%	-3%	3%	24.8%
Currencies	3%	-3%	-1%	6%	-1%	-1%	-4%	2%	-3%	-2.4%
Acquisitions/divestitures	-1%	1%	0%	-5%	-15%	1%	1%	2%	1%	-0.1%
Total	4%	3%	0%	-5%	-18%	12%	2%	-2%	0%	32.9%

¹ Figures for 2018 were restated with the presentation of the oil and gas activities as discontinued operations; no restatement was made for 2017 and earlier.

² Figures for 2013 have been adjusted to reflect the dissolution of the natural gas trading business disposal group.

³ We have applied International Reporting Standards IFRS 10 and 11 as well as International Accounting Standard 19 (revised) since January 1, 2013. Figures for 2012 have been restated.

Factors influencing sales

Sales rose by €19,449 million compared with the previous year to €78,598 million in 2021. This was mainly driven by higher prices and volumes in all segments. Price levels increased in the Chemicals, Surface Technologies and Materials segments in particular. Sales volumes grew primarily in the Surface Technologies and Materials segments. Currency effects, mainly relating to the U.S. dollar, had an offsetting effect. Sales performance was also weighed down by negative portfolio effects, especially in the Industrial Solutions segment following the divestiture of the global pigments business. This could only be partly offset by positive portfolio effects, mainly from the acquisition of a majority shareholding in BASF Shanshan Battery Materials Co., Ltd. in the Surface Technologies segment.

Currency impact

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 in our financial foreign currency risk management. These risks are hedged using derivative instruments, if necessary.

Annual impact of US\$/€ exchange rate change on BASF Group

(exchange rate: - \$0.01 per €)

Sales

€200 million

EBIT

€30 million

Financing

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.

Financing policy

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.

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, 2021, commercial paper with a carrying amount of €248 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. The credit line, as well as a short-term credit line of €3 billion that expired in the second quarter of 2021, were not used at any point in 2021. Our external financing is therefore largely independent of short-term fluctuations in the credit markets.

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

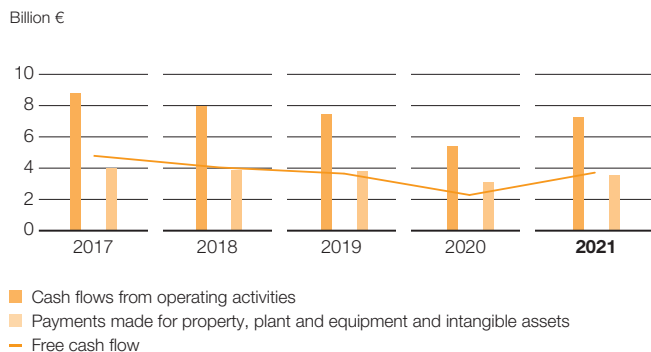
Group where possible. Foreign currency risks are primarily hedged centrally using derivative financial instruments in the market.

Cash flows from operating activities and free cash flow

Cash flows from operating activities amounted to €7,245 million, compared with €5,413 million in the previous year. The considerable increase was primarily due to the improvement in net income, which had included high impairments in the previous year. Accordingly, depreciation and amortization of property, plant and equipment and intangible assets was significantly below the prior-year figure in 2021, at €3,687 million. An offsetting factor was cash tied up in net working capital, which rose by €1,166 million to €1,566 million in 2021. This mainly resulted from the significant increase in inventories by €3,304 million due to higher business volumes and prices after a reduction in inventories had supported operating cash flows in the previous year.

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 €3,713 million in 2021, after €2,284 million in the previous year.

Cash flow



Good credit ratings and solid financing

BASF enjoys good credit ratings, especially compared with competitors in the chemical industry. Moody's most recently confirmed BASF's A3/P-2/outlook stable rating on May 6, 2022. Standard & Poor's confirmed its rating for BASF of A/A-1/outlook stable on January 6, 2022. Fitch's rating of A/F1/outlook stable from June 11, 2021, also remained unchanged.

Credit Ratings

Agency	Rating
Fitch	A/F1/outlook stable
Moody's	A3/P-2/outlook stable
Standard & Poor's	A/A-1/outlook stable

Ten-Year Summary

Million €

	2012 ¹	2013 ²	2014	2015	2016	2017	2018	2019	2020	2021
Statement of income										
Sales	72,129	73,973	74,326	70,449	57,550	61,223 ³	60,220 ⁴	59,316	59,149	78,598
Income from operations (EBIT)	6,742	7,160	7,626	6,248	6,275	7,587 ³	5,974 ⁴	4,201	-191	7,677
Income before income taxes	5,977	6,600	7,203	5,548	5,395	6,882 ³	5,233 ⁴	3,302	-1,562	7,448
Income after taxes from continuing operations	-	-	-	-	-	5,592	4,116 ⁴	2,546	-1,471	6,018
Income after taxes from discontinued operations	-	-	-	-	-	760	863 ⁴	5,945	396	-36
Income after taxes	5,067	5,113	5,492	4,301	4,255	6,352	4,979	8,491	-1,075	5,982
Net income	4,819	4,792	5,155	3,987	4,056	6,078	4,707	8,421	-1,060	5,523
Income from operations before depreciation and amortization (EBITDA)	10,009	10,432	11,043	10,649	10,526	10,765 ³	8,970 ⁴	8,185	6,494	11,355
EBIT before special items	6,647	7,077	7,357	6,739	6,309	7,645 ³	6,281 ⁴	4,643	3,560	7,768
Capital expenditures, depreciation and amortization										
Additions to property, plant and equipment and intangible assets	5,263	7,726	7,285	6,013	7,258	4,364	10,735	4,097	4,869	4,881
of which property, plant and equipment	4,084	6,428	6,369	5,742	4,377	4,028	5,040	3,842	4,075	4,410
Depreciation and amortization of property, plant and equipment and intangible assets	3,267	3,272	3,417	4,401	4,251	4,202	3,750 ⁴	4,146	6,685	3,678
of which property, plant and equipment	2,594	2,631	2,770	3,600	3,691	3,586	3,155 ⁴	3,408	5,189	3,064
Employees at year-end	110,782	112,206	113,292	112,435	113,830	115,490	122,404	117,628	110,302	111,047
Personnel expenses	8,963	9,285	9,224	9,982	10,165	10,610	10,659	10,924	10,576	11,097
Research and development expenses	1,732	1,849	1,884	1,953	1,863	1,843³	1,994⁴	2,158	2,086	2,216

¹ We have applied International Reporting Standards IFRS 10 and 11 as well as International Accounting Standard 19 (revised) since January 1, 2013. Figures for 2012 have been restated.

² Figures for 2013 have been adjusted to reflect the dissolution of the natural gas trading business disposal group.

³ Figures for 2017 were restated with the presentation of the oil and gas activities as discontinued operations.

⁴ Figures for 2018 were restated with the presentation of the construction chemicals activities as discontinued operations.

Million €

	2012 ¹	2013 ²	2014	2015	2016	2017	2018	2019	2020	2021
Balance sheet (IFRS)										
Total assets	62,726	64,204	71,359	70,836	76,496	78,768	86,556	86,950	80,292	87,383
Non-current assets	35,259	38,253	43,939	46,270	50,550	47,623	43,335	55,960	50,424	52,332
of which intangible assets	12,193	12,324	12,967	12,537	15,162	13,594	16,554	14,525	13,145	13,499
of which property, plant and equipment	16,610	19,229	23,496	25,260	26,413	25,258	20,780	21,792	19,647	21,553
Current assets	27,467	25,951	27,420	24,566	25,946	31,145	43,221	30,990	29,868	35,051
of which inventories	9,581	10,160	11,266	9,693	10,005	10,303	12,166	11,223	10,010	13,868
of which accounts receivable, trade	9,506	10,233	10,385	9,516	10,952	10,801	10,665	9,093	9,466	11,942
of which cash and cash equivalents	1,647	1,827	1,718	2,241	1,375	6,495	2,300	2,427	4,330	2,624
Equity	25,621	27,673	28,195	31,545	32,568	34,756	36,109	42,350	34,398	42,081
Total liabilities	37,105	36,531	43,164	39,291	43,928	44,012	50,447	44,600	45,894	45,301
of which financial indebtedness	12,798	14,407	15,384	15,197	16,312	18,032	20,841	18,377	19,214	17,184

¹ We have applied International Reporting Standards IFRS 10 and 11 as well as International Accounting Standard 19 (revised) since January 1, 2013. Figures for 2012 have been restated.

² Figures for 2013 have been adjusted to reflect the dissolution of the natural gas trading business disposal group.

		2012 ¹	2013 ²	2014	2015	2016	2017	2018	2019	2020	2021
Key data											
Earnings per share	€	5.25	5.22	5.61	4.34	4.42	6.62 ³	5.12	9.17	-1.15	6.01
Adjusted earnings per share	€	5.64	5.31	5.44	5.00	4.83	6.44 ³	5.87	4.00	3.21	6.76
Cash flows from operating activities	million €	6,602	8,100	6,958	9,446	7,717	8,785	7,939	7,474	5,413	7,245
EBITDA margin	%	13.9	14.1	14.9	15.1	18.3	17.6 ³	14.9 ⁴	13.8	11.0	14.4
Return on assets	%	11.0	11.5	11.7	8.7	8.2	9.5 ³	7.1	4.5	-1.2	9.5
Return on equity after tax	%	19.9	19.2	19.7	14.4	13.3	18.9	14.1	21.6	-2.8	15.6
Return on capital employed (ROCE)	%	-	-	-	-	-	15.4	12.0 ⁴	7.7	1.7	13.5
Appropriation of profits											
Net income of BASF SE ⁵	million €	2,880	2,826	5,853	2,158	2,808	3,130	2,982	3,899	3,946	3,928
Dividend	million €	2,388	2,480	2,572	2,664	2,755	2,847	2,939	3,031	3,031	3,072
Dividend per share	€	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.30	3.30	3.40
Number of shares as of December 31	million	918.5	918.5	918.5	918.5	918.5	918.5	918.5	918.5	918.5	918.5

¹ We have applied International Reporting Standards IFRS 10 and 11 as well as International Accounting Standard 19 (revised) since January 1, 2013. Figures for 2012 have been restated.

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⁴ Figures for 2018 were restated with the presentation of the construction chemicals activities as discontinued operations.

⁵ Calculated in accordance with German GAAP

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Half-Year Financial Report 2022

July 27, 2022

Quarterly Statement Q3 2022

October 26, 2022

BASF Report 2022

February 24, 2023

Quarterly Statement Q1 2023 / Annual Shareholders' Meeting 2023

April 27, 2023

Half-Year Financial Report 2023

July 28, 2023

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