

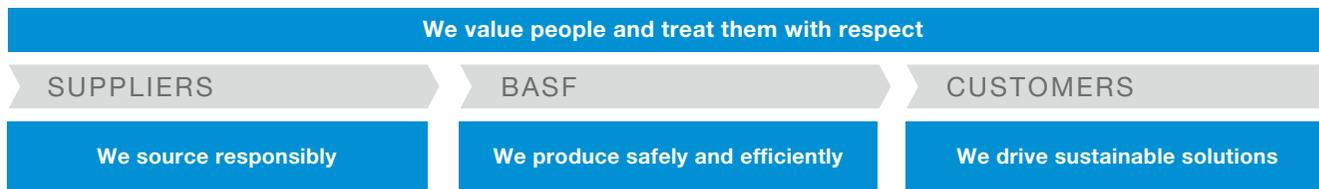
Sustainability Along the Value Chain

“We want to contribute to a better world with enhanced quality of life for everyone. That is why the three pillars of sustainability are firmly anchored in our corporate purpose, our strategy, our targets and our operating business. They are at the core of what we do, a driver for growth and an element of our risk management. We pursue a holistic approach that covers the entire value chain.”

We contribute to a sustainable development and to the **United Nations' Sustainable Development Goals (SDGs)** in many ways (see page 36). For instance, our innovations, products and technologies help to use natural resources more efficiently, meet the demand for food, enable climate-smart mobility, reduce emissions and waste, and increase the capabilities of renewable energy. Alongside these positive contributions, our business activities also have negative impacts. For example, we create CO₂ emissions, use water and procure raw materials from suppliers, which may involve a potential risk of human rights violations. This is why we are constantly working to broaden our positive contributions to key sustainability topics (see page 45) along our value chains and reduce the negative impacts.

We are committed to doing business in a **responsible, safe, resource-efficient and respectful** way. Our actions are guided by our corporate values and our global Code of Conduct. We comply with and in some cases exceed the applicable laws and regulations with voluntary commitments. We stipulate binding rules for our employees with standards and guidelines that apply throughout the Group. In doing so, we consider, respect and promote internationally recognized principles such as the 10 principles of the U.N. Global Compact and the Core Labor Standards of the International Labor Organization (ILO).

We want to ensure that we act in line with the applicable laws and uphold our responsibility to the environment and society with our comprehensive **management and monitoring systems**. Our Responsible Care Management System does this for environmental



protection, health and safety (see page 117). We meet our responsibilities with respect to international labor and social standards chiefly through three elements: the Compliance Program, close dialog with our stakeholders and the guideline on compliance with international labor norms, which applies Group-wide.

Our **business partners** are also expected to comply with prevailing laws and regulations and to align their actions with internationally recognized principles. We have established appropriate management and control systems, for example, for working with our suppliers (see page 109).

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

We are involved in numerous **sustainability initiatives** to drive forward sustainability in general and, specifically, as this relates to our value chains. These include the World Business Council for Sustainable Development (WBCSD) as well as networks with

thematic focus like the Alliance to End Plastic Waste (AEPW) or the Global Battery Alliance (GBA). In addition, we realize a wide range of projects – often together with partners – for example, to improve sustainability in the supply chain or to promote circularity in the economy.]

- [🔗](#) For more information on how we value people and treat them with respect, see page 97 onward
- For more information on responsible procurement, see page 109 onward
- For more information on safe and efficient production, see page 117 onward
- For more information on sustainable solutions, see page 141 onward

We Value People and Treat Them with Respect

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

In this section:
 Employees
 Responsibility for Human Rights
 Stakeholder Engagement
 Societal Engagement

Employees

GRI 102, 103, 201, 202, 203, 401, 402, 404, 405, 406, 407, 408, 409, 412, 413



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

At a glance

111,047

Employees around the world

- Employee engagement and leadership impact on center stage
- Promoting diversity and mutual respect
- Further expansion of virtual learning and digitalization

Strategy

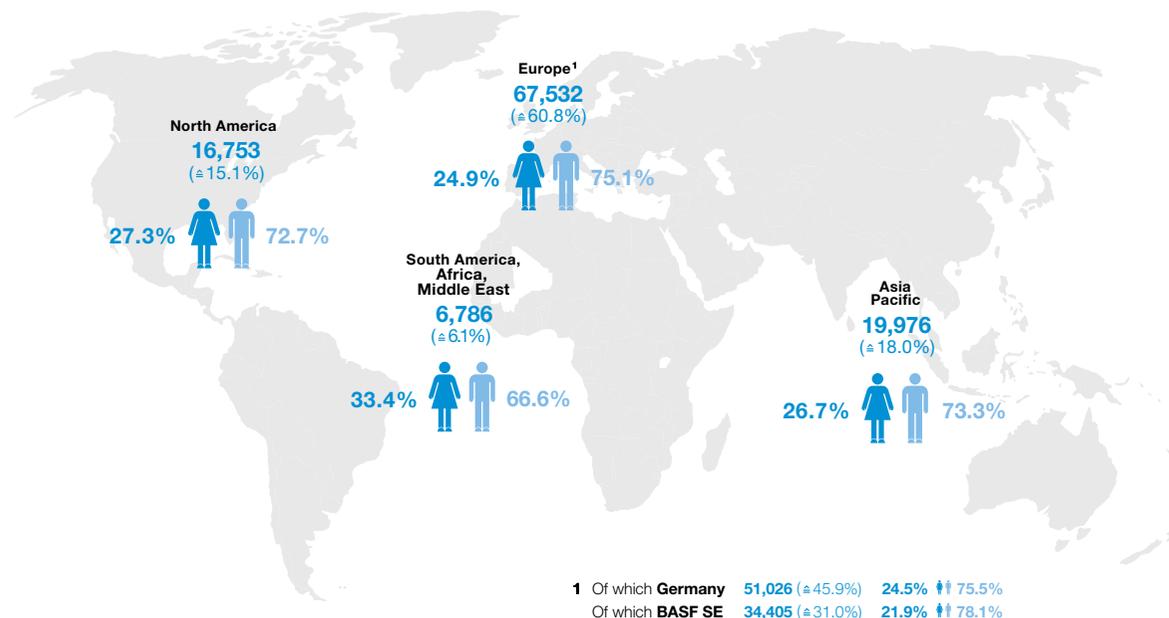
Our employees are key to the successful implementation of BASF's strategy. We are convinced of the value of excellent employees, leaders and working conditions, and strive to give our employees

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.

BASF Group employees by region

(Total: 111,047, of which 26.1% women, as of December 31, 2021)



Compensation and benefits as well as offerings to balance personal and professional life complete our diverse total offer package. In order to continue to attract talented people to our company in the future, we work continuously on BASF's attractiveness as an employer. Our employees play an important role here as ambassadors for BASF.]

Number of employees

As of December 31, 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 for 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 (of which 47.6% were women).

Employee engagement

[BASF can rely on the engagement of its employees. This is shown by a passion for the job, a dedication to top performance and a strong commitment to BASF. 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. The results are communicated to employees, the Board of Executive Directors, the Supervisory Board and stakeholders. We have performed regular global employee surveys since 2008. We aim to keep the high level of employee engagement determined by these surveys and increase it even further as far as possible. As part of the BASF strategy, we therefore set ourselves the following goal in 2018: More than 80% of our employees feel that at BASF, they

can thrive and perform at their best. We regularly calculate the employee engagement level as an index score based on five questions on set topics in our employee surveys. The most recent survey from 2020 revealed an engagement index of 82% (2019: 79%). Our aim is to keep this score above 80%. We support our leaders with a range of follow-up measures to decentrally address individual action areas and in this way, help to further strengthen employee engagement together with their employees.

Pulse checks were carried out to identify and address employees' specific needs in 2021. In North and South America, for example, surveys were conducted on the inclusion of diversity. These revealed a desire to further embed inclusive behavior in the working environment, among other things. Employees in Germany and Europe were surveyed about their current work situation, flexible working, stresses caused by the coronavirus pandemic and team sentiment. Among other things, the results showed that employees feel safe working at our sites and that employees who have been working flexibly since the start of the pandemic are coping well with it. Regular global employee surveys remain a focus, and we plan to conduct the next survey in spring 2022.]

What we expect from our leaders

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

Our specific expectations of leaders' conduct are derived from these: **The CORE Leadership Values** serve as the guiding principles for all leaders and set out BASF's expectations of leadership behavior. They are aligned with BASF's strategic goals and reflect our company's leadership vision (see also page 31).

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

In order to anchor the CORE Leadership Values in day-to-day life, an in-depth training course – CORE Leadership Upskilling – was offered in 2021. The virtual training comprised a series of modules that encouraged self-reflection and provided opportunities for global dialog. The training modules were initially completed by all senior executives worldwide. Work in small, mixed groups aimed to deepen participants' understanding of the CORE Leadership Values, enable in-depth discussion of these and expand global networks. Since the fall of 2021, additional leadership levels have undergone training and activities modeled on CORE Leadership Upskilling.

Regular feedback plays an important role in the development of leaders. We have therefore adapted our global feedback tool to enable leaders to, in the future, even better reflect on how these values are anchored in their leadership behavior.

Since 2020, various existing leadership development tools have been converted to virtual formats to optimally support our leaders – including during the challenging times of the coronavirus pandemic.]

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

Inclusion of diversity

The global character of our markets translates into different customer requirements. We want to reflect this diversity among our employees, too, because it enables them to better meet our customers' needs. 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.

Promoting and valuing diversity across all hierarchical levels is an integral part of our strategy and is also embedded in our corporate values. BASF strives to foster a working environment based on mutual respect, trust and appreciation. We expect inclusive conduct from all employees and our leaders. By this, we mean creating an environment in which different aspects of diversity and individual strengths are valued.

Our leaders play an important role in promoting diversity and creating an inclusive work environment. We support them with various offerings, for example as part of leadership development. A toolbox with a wide range of content inspires a change of perspective and a podcast series from leaders shows the importance of appreciative, fair and inclusive leadership.

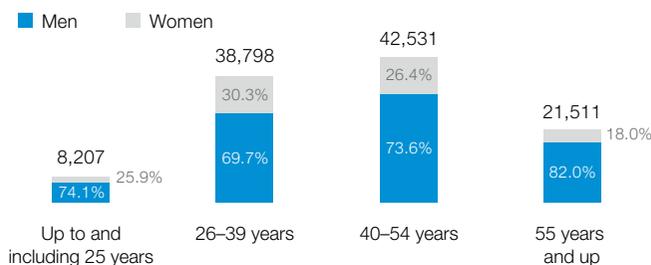
Integrating different perspectives is very important to BASF. There are a number of Employee Resource Groups around the world dedicated to different aspects of diversity. In addition, we want to create a greater awareness of diversity in our organization with various activities. BASF supports the German Diversity Charter and has participated in German Diversity Day and European Diversity Month with various virtual initiatives and offerings. At our Ludwigshafen site in Germany, we campaigned against racism and discrimination as part of the International Weeks Against Racism.

BASF is one of approximately 150 companies that support the United Nations Global LGBTI (lesbian, gay, bi, trans and intersex) Standards of Conduct for business and has done so since 2018. Employees again promoted openness, acceptance and tolerance with many activities to support the LGBTI movement at various sites around the world in 2021.

Diversity also relates to the company's demographic profile, which varies widely by region within the BASF Group. Our aim is to create a suitable framework to help maintain the employability of our personnel at all stages of life and ensure the availability of qualified employees over the long term.

BASF Group employee age structure

(Total: 111,047, of which 26.1% women, as of December 31, 2021)



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 and continuously review our 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%).

2030 target

Proportion of women in leadership positions with disciplinary responsibility

30%

In order to continuously monitor our progress toward this target, we have developed a global dashboard, which is used to regularly review the implementation status. The systematic advancement of women is also an integral part of our process for selecting senior executives.

As a signatory to the United Nations' Women's Empowerment Principles (WEPs), we are committed to promoting gender equality. We are also involved in other external initiatives to promote inclusion of diversity at work, such as the Chefsache initiative and the European Round Table. Employees from all regions took International Women's Day 2021 as an opportunity to reflect on the current situation of women at BASF, celebrate successes and campaign for greater equality.

Leaders and professionals in the BASF Group

	December 31, 2021	Of which women (%)
(Senior) executives ^a	9,006	25.6
Professionals ^b	40,030	32.5

^a Employees with disciplinary leadership responsibilities
^b Specialists without disciplinary leadership responsibilities

For more information on diversity in the Board of Executive Directors and the Supervisory Board, see page 167 onward

For more information on diversity and inclusion, see [basf.com/diversity](https://www.basf.com/diversity)

Competition for talent

Attracting and retaining the best employees is crucial to our success. Having an attractive and compelling total offer package for employees is becoming increasingly important given the strong global competition for the best qualified employees and leaders. This is why we are constantly working on measures to increase BASF's attractiveness in the global labor markets.

We are increasingly using digital platforms such as our country-specific career websites as well as global and regional social networks to reach potential candidates. This enables us to appropriately address different target groups.

In light of the coronavirus pandemic, we primarily used digital solutions for our **talent search activities** in 2021 and participated in a few in-person events. To also provide the best possible information on BASF as an employer virtually, we are continuously developing our digital presence. For example, we are represented at digital trade fairs and conferences, conduct digital excursions for students from various universities of sites in Germany, and organize expert lectures for future talent. This virtual contact enables a demand-oriented, flexible and location-independent approach. As a result, we were able to continue to attract and recruit talented employees.

In addition, we consistently take part in specific career events to directly reach and attract talent from various disciplines, especially female candidates. We focus in particular on our female employees as role models with various initiatives such as podcasts, career fairs and networking events aimed specifically at women, or on our social media channels.

In 2021, we established a digital onboarding process at some sites for new employees and their managers in the period up to the first day of work and beyond. The aim is to ensure a successful first day at work and to build an early bond between the new colleagues and their future team at BASF, for example by sending video messages and information about the division and team. We want to continue to drive forward global implementation in 2022.

To combat the shortage of skilled workers in production and technical areas, due among other factors to demographic-related declines in Ludwigshafen, Germany, we have strengthened our social media presence, for example, to alert qualified specialists to new career prospects at BASF. In addition, we cooperate with local radio stations and the German employment agency to target skilled workers at informational events.

We once again achieved high scores in a number of employer rankings in 2021. For example, in a study conducted by Universum, young scientists ranked BASF as the second most attractive employer in Germany (2020: fifth). In North America, DiversityInc named BASF as one of the top 50 companies for diversity in recruiting for the ninth consecutive year. In Asia, Top Employer recognized BASF China as one of the best employers for the twelfth time in succession. In South America, LinkedIn ranked BASF second in its list of top companies in Brazil.

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 desirable low level.

BASF Group new hires in 2021

	2021	Of which women (%)
Europe	4,045	30.4
North America	2,551	29.3
Asia Pacific	2,797	31.0
South America, Africa, Middle East	900	48.4
Total	10,293	31.9

As of December 31, 2021, the BASF Group was training 3,028 people in 12 countries and around 50 occupations. We spent a total of around €119 million on vocational training in 2021.]

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

Learning and development

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

In our understanding, there is more to development than a promotion or a job change – it encompasses the development of personal experience and abilities. In regular development meetings, which are held as part of our annual employee dialogs, employees outline ideas for their individual development together with their leaders and determine specific measures for further training and development, which focus on personal and professional competencies. Our learning activities follow the “70-20-10” philosophy: We apply the elements “learning from experience” (70%), “learning from others” (20%) and “learning through courses and media” (10%). Our learning and development offerings cover a range of learning goals: Starting a career, expanding knowledge, personal growth and leadership development.

Digital learning formats play an important role in our development offerings. Even before the coronavirus pandemic, training for leaders and employees was updated to meet the challenges of the digital transformation and modern working life with appropriate learning formats and content. For example, platforms such as the Digital Campus, Digitalization & Me and the Ways of Working portal were enhanced and refined to support employees in all aspects of virtual collaboration and in building their digital skills. The continuous

Good to know



Future of Work @ BASF

The coronavirus pandemic has fundamentally changed how we work. That is why our Future of Work @ BASF initiative addresses the question of how our teams can find the right balance between on-site and remote working to continue to perform at their best in the future. Connectedness and close dialog remain our number one priorities – both are key to team spirit, creativity and innovation. The wide range of jobs, tasks and local conditions make different working models necessary. To reflect this, our local teams are developing tailored solutions within global guidelines that meet individual requirements. Workshop concepts and training support the process.

One example is the Flex Work @ LU project at the Ludwigshafen site in Germany. The focus is on the shift toward greater flexibility as well as practical solutions on how to maintain and strengthen connectedness in an increasingly hybrid working environment – from new office concepts to IT solutions and tips for teamwork. The ideas are tested together with pilot units. Successful concepts are made available to all units at the site in the form of a toolbox.

development of our employees' digital skills will remain crucial going forward. The portfolio includes offerings for self-directed learning, as well as individual consulting and support for teams and leaders around the digital transformation. Employees and leaders can also hold joint workshops in an avatar-based 3D working and learning environment. In addition, the many academies in the divisions and service units also offer training on specific professional content.

We enable our employees to take responsibility for their own professional development within the company with digital and novel offerings. To support multidisciplinary teams in the development of products, services or business models, workshops on design thinking empower participants to find creative and innovative solutions to complex problems. By providing interactive spaces, the concept also lends itself to hybrid working methods. This fosters an agile learning and working culture, which will ultimately also help us to master the digital transformation.

Against the backdrop of the digital transformation, we support our leaders in questions about shaping the **working world of the future**. For example, the #liveitleadit program provides insights into various areas of the organization and the opportunity to discuss topics such as hybrid working or living a failure culture.]

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 the global and local levels.

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. The same principles basically apply for all employees worldwide. The amount of the variable component is determined by economic success as well as the employee's individual performance. We use the BASF Group's return on capital employed (ROCE) to measure economic success for the purposes of **variable compensation**. This links variable compensation to our ROCE target.¹ Individual performance is assessed as part of a globally consistent performance management process. In numerous Group companies, our "plus" share program ensures employees' long-term participation in the company's success through incentive shares. In 2021, for example, around 23,600 employees worldwide (2020: around 27,600) participated in the "plus" share program.

Since 2020, BASF has offered senior executives the opportunity to participate in a **long-term incentive (LTI) program**² in the form of a performance share plan. The LTI program has a term of four years

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 The LTI program referred to here is aimed at management levels 2 to 4 as well as individual employees who have attained senior executive status by virtue of special expertise. For more information on the compensation of the Board of Executive Directors and the Supervisory Board, see the Compensation Report at [basf.com/compensationreport](https://www.basf.com/compensationreport)

and takes into account the development of the total shareholder return. It incentivizes the achievement of strategic growth, profitability and sustainability targets. To take part in this program, participants must hold BASF shares, the amount of which is based on their individual fixed compensation. In 2021, around 91% of the people eligible to participate in the LTI around the world did so, holding between 30% and 70% of their fixed annual compensation in BASF shares.

The share price-based compensation program (BASF Option Program, BOP), which had existed since 1999, was offered for the last time in 2020. Around 87% of the people eligible to participate in the program around the world did so, investing up to 30% of their actual variable compensation (for the 2019 business year) in BASF shares.]

For more information on share-price based compensation programs and BASF's share programs, see the Notes to the Consolidated Financial Statements from page 280 onward

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

Personnel expenses

The BASF Group's expenses for wages and salaries, social security contributions and assistance, as well as for pensions in 2021 totaled €11,097 million. In 2020, these expenses amounted to €10,576 million and included personnel expenses from the disposal group for the construction chemicals business in the amount of €291 million until the date of the divestiture. The rise in personnel expenses in 2021 was mainly due to higher bonus provisions. Particularly the lower average number of employees had an offsetting impact.

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%

Balancing personal and professional life

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

Our flexible tools proved helpful during the coronavirus pandemic. They help our employees to master the increased challenges around work and personal life during the pandemic and will continue to provide flexibility. To integrate the positive experiences from the surge in remote working into our working culture, we have developed global guiding principles and a framework for the future of work (see box on page 101).

Regional initiatives specifically address the needs of our employees at a local level. For example, flexible co-working spaces in the Rhine-Neckar region in Germany were tested in pilot projects and a framework for potential future uses was developed.

Our **Work-Life Management employee center** in Ludwigshafen, Germany, (LuMit) offers a number of services under one roof: child-care, fitness and health, and social counseling and coaching offered by BASF Stiftung. Services were adapted so they could continue during the coronavirus pandemic based on the current coronavirus laws and local restrictions. We also provide employee assistance programs at other sites in Germany and around the world to help employees overcome difficult life situations and maintain and restore their employability. Social counseling and coaching also enabled employees and their families to receive extensive support during the coronavirus pandemic, for example by expanding telephone services.]

Dialog with employee representatives

Trust-based cooperation with employee representatives is an important component of our corporate culture. Our open and continual dialog lays the foundation for balancing the interests of the company and its employees, even in challenging situations. In the case of organizational changes or if restructuring leads to staff downsizing, for example, or in the case of codetermination-relevant topics, we involve employee representatives at an early stage to develop socially responsible implementation measures. In 2021, this happened in connection with the planned organizational realignment of research, for example. Our actions are aligned with the respective legal regulations and the agreements reached, as well as operational conditions. The organizational protective measures taken during the coronavirus pandemic to date are backed by our employee representatives.

By focusing our discussions on the local and regional situations, we aim to find tailored solutions to the different challenges and legal conditions for each site. The BASF Europa Betriebsrat (European Works Council) addresses cross-border matters in Europe. In South America, we foster dialog with the Diálogo Social. In China, we work together with trade unions that have been organized locally within the framework of legal possibilities.]

For more information, see basf.com/employeerepresentation

International labor and social standards

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. We mainly approach our adherence to international labor and social standards using three elements: the Compliance Program (including compliance hotlines), close dialog with our stakeholders (such as with employee representatives or international organizations) and the BASF guideline on compliance with international labor norms, which applies Group-wide. This guideline makes concrete the topics in our global Code of Conduct under "Human rights, labor and social standards" as these relate to our employees.

It forms the basis for our global, risk-based management process: We regularly monitor changes to the national law of all the countries in which BASF operates and evaluate our adherence to international labor and social standards. If the national law contains no or lower requirements, action plans are drawn up to successively close these gaps in a reasonable time frame. If conflicts with national law or practices arise, we strive to act in accordance with our values and internationally recognized principles without violating the law of the country concerned. As part of the management process, we

regularly follow up on and document the results of the comparison between national law and our guideline, as well as measures to implement the guideline. This is part of our central due diligence system. An additional component of our corporate due diligence is our training concept, which was enhanced and refined in 2021. It includes target group-specific training and e-learning modules as well as a global platform for internal dialog.

We monitor our voluntary commitment to international labor and social standards as part of our management process. As before, individual elements of the guideline are also reviewed as part of internal control processes such as Responsible Care audits at BASF Group companies. In addition to these quality assurance measures, compliance with international labor and social standards is an integral part of the standard questionnaire in the compliance management audits conducted by BASF's Corporate Audit department.]

For more information on global standards, see page 31

For more information on our responsibility for human rights, see page 104

For more information on compliance, see page 171 onward

For more information on standards in our supply chain, see page 109 onward

For more information on labor and social standards, see basf.com/labor_social_standards

Responsibility for Human Rights

GRI 102, 103, 406, 410, 411, 412, 413



BASF acknowledges its responsibility to respect internationally recognized human rights. For many years now, we have engaged in constructive dialog on human rights with other companies, nongovernmental organizations, international organizations and multi-stakeholder initiatives to better understand different perspectives and address conflicting goals. BASF is a founding member of the U.N. Global Compact and a member of the Global Business Initiative on Human Rights (GBI), a group of globally operating companies from various sectors. The initiative aims to ensure implementation of the U.N. Guiding Principles on Business and Human Rights.

At a glance

- Human rights due diligence as a Group-wide task
- Systematic and extensive anchoring of human rights topics in company processes and culture

We see human rights due diligence as an important, **all-encompassing task** that we can only perform by working together as a team throughout the entire organization. That is why we have embedded our responsibility for human rights into our Code of Conduct and set this out in our human rights position. We uphold our standards worldwide, including where they exceed local legal requirements. All employees and leaders are responsible for ensuring that we act in accordance with our Code of Conduct and our human rights position.

We rely on a systematic, integrated, risk-based approach and **established monitoring and management systems**. BASF is also active in initiatives such as Together for Sustainability (TfS) and Responsible Care®, which promote sustainability in the supply chain. Our measures and criteria for monitoring and observing human

rights are integrated into supplier assessment processes and our global monitoring systems for environmental protection, safety and security, health protection and product stewardship. They are also part of the evaluation of investment, acquisition and divestiture projects, assessments along the entire product life cycle, and systems to monitor labor and social standards. In addition, aspects of human rights topics are part of the global qualification requirements for our security personnel and are incorporated into agreements with contractors.

Our **compliance unit** is responsible for steering human rights topics and coordinates the work of the cross-unit Human Rights Expert Working Group, which we established in 2020. In it, employees from specialist units – procurement, legal, HR, environmental protection, health and safety, sustainability strategy, site security, supply chain, communications and government relations – and the operating divisions work closely together. The expert working group provides support and advice in challenging and critical situations, on the development of internal processes, and on the creation of information and training offerings, among other things. This is how we ensure that we approach our human rights responsibility holistically and that we can continually improve our performance.

In 2020, we conducted a comprehensive **review** of our human rights management system and the related processes. This showed that we have achieved important milestones regarding our due diligence obligations. However, the analysis, which was discussed by the Board of Executive Directors, also identified potential for improvement, for example with regard to awareness of human rights topics within our organization and relating to the integration of these topics in our guidelines and processes.

We therefore launched a global, internal campaign in April 2021 to raise awareness on the topic of human rights. Externally, we were involved in the U.N.'s International Year for the Elimination of Child Labour through two initiatives and together with other partners, and committed to specific joint measures in the fight against child labor. Together with other DAX-listed companies, we also participated in the study “Moving with responsibility toward success:

practical implementation of human rights due diligence in 10 companies” commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the German Agency for International Cooperation (GIZ).

We strengthened awareness of our due diligence obligations in procurement by including additional information on human rights topics in training. In addition, the human rights risk assessment is more systematically incorporated into strategy development in our procurement segments (see page 109).

We also further improved our **grievance mechanisms** and introduced a standardized global external and internal hotline and reporting system in 2021. For example, we expanded the number of languages available. A new website provides information about the hotline and the grievance procedure, and now also offers the option of contacting the company anonymously online in addition to local telephone numbers. Employees can also contact specialists directly via an internal online platform or the corresponding app. The processing status of a submitted report can be tracked anonymously. Moreover, submitted cases will be able to be recorded and evaluated more systematically in the future (see page 171 onward). In 2021, 206 human rights-related complaints were received by phone as well as by post and e-mail. All complaints were reviewed and forwarded to the relevant departments for in-depth investigation. If justified, appropriate measures were taken.

We see assuming our human rights responsibilities as a continuous process. That is why we continuously review our policies and processes and update them whenever necessary. We are currently examining further development measures in various working groups against the backdrop of new regulations such as the German Act on Corporate Due Diligence Obligations in Supply Chains (LkSG) and the forthcoming E.U. legislation on due diligence in the supply chain.

We established a **Human Rights Advisory Council** in 2020 to systematically integrate external expertise. Its members include independent international human rights experts. The trust-based dialog on human rights topics helps us to better understand different

perspectives and to deal more openly with critical situations. At the same time, the renowned external experts show us where we have potential for improvement and help us to build on our strengths in how we handle human rights. The meetings, which are chaired by our Chief Compliance Officer, are also attended by employees from the sustainability strategy and compliance units. Other representatives, for example, from the operating divisions or procurement, are invited depending on the focus topics. In this way, the Human Rights Advisory Council provides an external perspective on establishing and improving our processes, and contributes this in discussions with the leadership team.

We maintained our dialog with the Human Rights Advisory Council throughout 2021, both with the body as a whole and in small groups, and with individual experts. The topics discussed included responsible supply chain management, for example in challenging supplier relationships or in high-risk regions. Our contribution to the responsible use of our solutions and products was also discussed.

In 2021, we stepped up our **commitment to action areas with increased risk potential**, such as battery materials (see box on the right). Where conflict minerals (tin, tantalum, tungsten, their ores and gold) are used, we pay attention to the implementation of the relevant E.U. regulation in our supply and value chains. We also set store on certified sustainable supply chains and fair working conditions in the procurement of raw materials such as palm oil, palm kernel oil and castor oil. We maintain dialog with national and international NGOs and are involved in numerous networks and partnerships (see page 113 onward). These include the Cobalt for Development initiative in the Democratic Republic of Congo, the Responsible Lithium Partnership in Chile, the Global Battery Alliance and the Roundtable on Sustainable Palm Oil (RSPO).

As an international company, we are a part of society in the countries in which we operate and have business relationships with partners around the world. We are confronted by the fact that there are states that do not honor their obligation to protect human rights. People are particularly at risk in such countries and companies' ability to act is often limited. We are committed to our values –

including and especially there – and contribute to the respect of human rights.

We have trustful working relationships with our partners (customers, suppliers, joint venture partners, contractors), expect them to comply with internationally recognized human rights standards and to demand the same of their partners further along the value chain. We support our partners in their efforts to meet their respective responsibilities.

We can only meet our goal of eradicating human rights abuses along our value chains if we work together. We have defined our expectations in a binding **Supplier Code of Conduct**. We are in close contact with our business partners, especially in higher-risk areas and regions, and monitor the implementation of required standards and measures for improvement. We use recognized assessments and audits to verify this.

Good to know

Battery Minerals Task Force

In 2021, BASF established a Battery Minerals Task Force to meet the specific challenges associated with the growing demand for battery materials. It bundles the expertise of the Catalysts division and various functional units. The initiative was formed to address the risks and opportunities of our global raw material supply chains for battery materials from a sustainability viewpoint and steer the resulting activities. The aim is to ensure the responsible procurement of battery materials. The task force is also responsible for the ongoing development of our internal guidelines to ensure their continuous improvement and adaptation to new regulatory requirements, as well as to take account of developments in our business areas.

For more information on supplier management, see page 109 onward

For more information on mineral raw materials, see page 115 onward

We report on our global targets, monitoring systems and measures to integrate human rights topics into our business activities in publications such as this report and online.

For more information on standards in our supply chain, see page 109 onward

For more information on raw materials, see page 112 onward

For more information on our production standards, see page 119 onward

For more information on systems for monitoring labor and social standards, see page 103 onward

For more information on corporate governance and compliance, see page 161 onward

See basf.com/humanrights for more information on the human rights position and a comprehensive report on the implementation of due diligence in human rights in accordance with the requirements of the National Action Plan developed by the German government, and in accordance with the U.N. Guiding Principles on Business and Human Rights

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

Stakeholder Engagement

GRI 102, 103, 413, 415

At a glance

- Dialog with various stakeholder groups with a focus on the integration of the U.N. Sustainable Development Goals (SDGs)
- The Stakeholder Advisory Council's focus areas: climate protection, the energy transformation and food security

We leverage the expertise of global initiatives and networks and actively engage in dialog with various stakeholder groups, contributing our expertise

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, including the Sustainable Finance platform in the form of the CFO Taskforce for the SDGs, and the Decent Work in Global Supply Chains action platform, in which company representatives and experts discuss how respecting human and labor rights is crucial to achieving the SDGs. With the six-month SDG Ambition program, the UNGC and the German Global Compact Network (DGCN) support participating companies in aligning their sustainability targets more closely with the SDGs and deriving specific measures from them. BASF is also active in 13 local Global Compact networks.

In 2021, we again discussed relevant sustainability topics with the **Stakeholder Advisory Council**. Focus topics included climate protection, the energy transformation and food security. Topics discussed by the Human Rights Advisory Council, which is chaired by our Chief Compliance Officer, included particular challenges in the battery materials value chain.

We promote digital dialog on sustainability topics. In November 2021, we held the second hackathon as part of the Climathon initiative in North and South America, where employees developed digital solutions for sustainability topics.

For more information on stakeholder dialog, see basf.com/en/stakeholder-dialog

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

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

Societal Engagement

GRI 203, 413

At a glance

- BASF a responsible neighbor at sites worldwide
- New business models improve local living conditions

Through our societal engagement, we want to address the needs of the communities surrounding our production sites worldwide, help achieve the SDGs, and have a positive long-term impact on the environment and society. This is why societal engagement is a cornerstone of our corporate social responsibility. It encompasses the focus areas of health, skills and resources.

We work with partners worldwide to **promote public health**, for example, to combat malaria. Through our New Nets project in cooperation with The Global Fund, Unitaid and other financial partners, approximately 25 million of our Interceptor® G2 mosquito nets had been distributed in African countries as of December 2021. These were specially developed to counter insecticide resistance in the fight against malaria and contain two different insecticides. The project goal is to distribute a total of around 35 million nets by the end of 2022.

At the U.N. Food Systems Summit 2021, BASF signed the Zero Hunger Private Sector Pledge and announced that it would invest \$11 million in initiatives in Africa, Asia, Central and South America, such as for seed production, malaria prevention and food fortification

as well as smallholder projects. The projects aim to help achieve SDG 2 by 2030 (Zero hunger). Forty-three companies signed the pledge, which is implemented by the Global Alliance for Improved Nutrition (GAIN) and other international organizations.

As a **responsible neighbor** and a partner in the Rhine-Neckar metropolitan region in Germany, our societal engagement strategy strengthens the participation and integration of disadvantaged groups, and promotes research and discovery.

With Wissensfabrik – Unternehmen für Deutschland e.V., we promote a network of around 130 companies and corporate foundations that sponsor educational institutions and start-ups to support children, young people, students and young entrepreneurs. The focus is on school projects that provide hands-on experience with STEM (science, technology, engineering and mathematics). Due to the coronavirus pandemic, the project's initiatives (such as IT2School – Gemeinsam IT entdecken and KiTec – Kinder entdecken Technik) were also offered in digital formats, allowing these educational programs to continue even as school operations were restricted. In the new City4Future project launched in early 2022, schoolchildren explore topics related to energy, climate change and sustainability through play and can develop ideas for the urban living space of the future.

In South America, BASF initiated the Connect to Transform open call and has so far supported 48 social and environmental projects, such as the Geração Futura Institute's Mão na Massa project near our local site in the São Bernardo do Campo region. The project trains women as bakers to promote their financial and personal autonomy.

We aim to create long-term value for BASF and society with new business models and cross-sector partnerships. Our **Starting Ventures program** helps people from low-income areas to improve their economic opportunities and their quality of life. The program also provides access to new markets and partners, and contributes to reaching the SDGs. A new internal application round for Starting Ventures projects was launched in October 2021. The projects,

which aim to help improve local living conditions, then enter the implementation phase. BASF contributes both technical expertise and resources to the projects to address local challenges and contribute to the SDGs. One project under our Starting Ventures program is the Waste-2-Chemicals project in Lagos, Nigeria. Under the project, plastic waste is collected by local residents, sorted and then converted into pyrolysis oil. This pyrolysis oil is used as feedstock in the production of high-quality chemical products. In cooperation with nonprofit organizations, this will enable local waste collectors and their families to earn a regular income.

BASF Group expenses for societal engagement activities¹

~€30 million

In the area of **international development cooperation**, we support the independent charitable BASF Stiftung with donations for its projects in cooperation with various organizations. The 2021 year-end donation campaign in favor of BASF Stiftung supported the United Nations Children's Fund, UNICEF, which celebrated its 75th anniversary. Together with the Indian organization ChildLine and other partners, UNICEF is working to provide psychosocial care for children in India who have had difficulty accessing important services as a result of the pandemic. BASF doubled the donations made by employees of participating German Group companies to a total of around €600,000.

BASF also made donations to support those affected by natural disasters in 2021. In July, BASF donated €1 million to flood relief in Germany, which hit the states of North Rhine-Westphalia and Rhineland-Palatinate particularly hard. The donation went to the German Red Cross, which was active in these crisis regions. In August, BASF doubled the amount donated by employees at its

German sites (€702,668 in total) to around €1.4 million. BASF Stiftung distributed the donations to affected private households and charitable institutions. In September, BASF donated \$500,000 to disaster relief following Hurricane Ida and for long-term recovery efforts in Louisiana. Local nonprofit organizations used \$300,000 of this amount for emergency relief and reconstruction. In addition, \$200,000 went to supporting BASF employees who were directly impacted by the effects of the hurricane.

[For more information on Starting Ventures, see \[basf.com/en/starting-ventures\]\(https://basf.com/en/starting-ventures\)](https://basf.com/en/starting-ventures)

[For more information on societal engagement at our sites, see \[ludwigshafen.basf.de\]\(https://ludwigshafen.basf.de\)](https://ludwigshafen.basf.de)

[For more information on our societal engagement around the world, see \[basf.com/en/engagement\]\(https://basf.com/en/engagement\)](https://basf.com/en/engagement)

¹ As of 2020, we report a total figure for our societal engagement activities. The figure includes all consolidated companies with employees, including joint operations.



Dr. Sung Min Pyo, a pharmacist in the Nutrition & Health division and part of BASF's interdisciplinary team at the coronavirus vaccination center, is responsible for ensuring that the vaccines are used as required, among other things.

In focus:

Continuation of Global Aid Measures During the Coronavirus Pandemic

BASF launched the Helping Hands aid campaign in 2020 to help fight the coronavirus and its effects. In 2021, we continued to use our expertise in research, production, procurement and logistics to support people affected by the pandemic around the world.

[In April 2021, BASF opened the **first accredited corporate coronavirus vaccination center in Germany** at its Ludwigshafen site. More than 22,000 primary vaccinations and more than 21,000 secondary vaccinations were administered there from April to August and more than 10,000 booster vaccinations were administered there in December to BASF employees, contractors and site partners. The coronavirus vaccination center was established and operated by an interdisciplinary team from various BASF units, coordinated by Corporate Health Management.

A global working group in our Pharma Solutions business unit has supported pharmaceutical companies in their research on vaccines and therapies to combat COVID-19 since March 2020. The task force reviews patent applications, clinical trials and scientific publications to identify potential collaborations with companies. BASF is currently supporting the global development of more than 80 therapies with its ingredients and expertise.

BASF products were used to **cool coronavirus vaccines**. For instance, Elastopir® insulation panels were produced in cooperation with a partner in Malaysia and used to equip refrigerated warehouses in Asia. In cooperation with various partners in Germany, Neopor® and Styropor®, BASF's expandable polystyrenes (EPS), were used to produce boxes to transport COVID-19 vaccines due to their good insulating and shock-absorbing properties.

In 2021, BASF also provided **in-kind support** around the world to overcome the challenges posed by the coronavirus pandemic. For example, BASF donated molecular sieves to the Indian government to facilitate the production of medical oxygen. Medical equipment, including ventilators, was also donated, and acute care units were set up in Mumbai together with partners. We donated medical equipment to Malaysian hospitals for the treatment of COVID-19 patients. In South America, BASF launched a food drive and donated food packages to communities around BASF sites. The food was distributed there to those in need with the help of employees who volunteered their time.]

For more information on the Helping Hands aid campaign, see basf.com/en/helping-hands

We Source Responsibly

As a global business, we have a responsibility to manage our supply chain carefully. We connect with our suppliers to source responsibly. Our partnerships with suppliers are based on mutual value creation, as well as a reliable supply of raw materials, technical goods and services at competitive prices.

In this section:
Supplier Management
Raw Materials

Supplier Management

GRI 102, 103, 204, 308, 403, 407, 408, 409, 414



BASF sources a wide range of raw materials, precursors, technical goods and services. Our suppliers are an important part of our value chain. Our objective is to secure competitive advantages through our professional procurement structures, to establish stable and reliable supply chains, and at the same time, meet high ethical and environmental standards. Together with our suppliers, we want to improve sustainability in the supply chain and minimize risks.

At a glance

€43.5 billion
global procurement spend

85%
of relevant spend¹ covered by sustainability evaluations

- Sustainability-oriented supply chain management
- Global targets to increase sustainability in the supply chain
- Supplier Code of Conduct creates transparency
- Risk-based approach with clearly defined follow-up processes

Strategy

Our partnerships with suppliers are based on mutual value creation, as well as a reliable supply of raw materials, precursors, technical goods and services at competitive prices.² In doing so, we want to generate long-term benefits for both sides. Our **sustainability-oriented supply chain management** is an integral part of our risk management. We have defined our standards and processes in a global guideline. We are continually refining and optimizing this to respond to changes in the regulatory environment and new requirements resulting, for example, from new laws and initiatives at national and international level. Procurement management systems such as guidelines and targets are set centrally and are binding for all employees with procurement responsibility worldwide.

Our risk-based approach aims to identify and evaluate sustainability matters in our value chains as best possible to improve sustainability together with our suppliers. We regularly review and document progress based on the risk level. Employees with procurement responsibility receive ongoing training in sustainability-oriented supplier management and responsible procurement. In 2021, 250 BASF employees received such training.

Our expectations of our suppliers are laid down in the global Supplier Code of Conduct. This creates clarity around the standards to be met. We count on reliable supplier relationships and support our suppliers in implementing our requirements. In 2021, we also launched the Supplier CO₂ Management Program. With

this program, we want to systematically gather data on upstream Scope 3 emissions to identify medium-term measures for optimization (see page 130). We make our suppliers' contribution to sustainable development transparent for us and for our stakeholders.

[For more information on suppliers, see basf.com/suppliers](https://www.basf.com/suppliers)

Global targets

We actively promote sustainability in the supply chain and have set ourselves ambitious targets for this: By 2025, we aim to have conducted sustainability evaluations for 90% of the BASF Group's relevant spend² and will develop action plans where improvement is necessary. In addition, we aim to have 80% of suppliers improve their sustainability performance upon re-evaluation by 2025. In 2021, 85% of the relevant spend had been evaluated. Of the suppliers re-evaluated in 2021, 74% had improved. Both global targets are embedded in the target agreements of persons responsible for procurement.

Worldwide procurement

Our more than 70,000 suppliers make an important contribution to our value creation. We work in long-term partnership with companies from different industries around the world. They supply us with raw materials, precursors, investment goods and consumables, perform a range of services and are innovation partners.

¹ We understand relevant spend as procurement volumes with relevant suppliers. We define relevant suppliers as Tier 1 suppliers showing an elevated sustainability risk potential as identified by our risk matrices, our purchasers' assessments or other sources.

² BASF considers all direct suppliers of the BASF Group in the business year concerned as Tier 1 suppliers. These are suppliers that provide us with raw materials, investment goods, consumables and services. Suppliers can be natural persons, companies or legal persons under public law.

2025 target

90%

Share of relevant spend covered by sustainability evaluations

80%

Percentage of suppliers with improved sustainability performance upon re-evaluation

We acquired raw materials, goods and services for our own production worth approximately €43.5 billion in 2021. Of this, around 90% was procured locally.¹ There were no substantial changes to our supplier structure.

What we expect from our suppliers

Together with our suppliers, we want to improve sustainability in the supply chain. Consequently, we expect our suppliers to comply with the applicable laws in full and to adhere to internationally recognized environmental, social and corporate governance (ESG) standards. We also expect our suppliers to make an effort to enforce these standards at their suppliers. In addition, we ask our suppliers to acknowledge, support and abide by our Supplier Code of Conduct – or to demonstrate and ensure their commitment to the principles specified in the Code of Conduct, for example in their own code of conduct.

Our global **Supplier Code of Conduct** is founded on internationally recognized guidelines, such as the principles of the United Nations' Global Compact, the U.N. Guiding Principles on Business and Human Rights, the International Labor Organization (ILO) conventions and the topic areas of the Responsible Care initiative. Topics covered by the Code of Conduct include compliance with human rights, the exclusion of child and forced labor, safeguarding labor and social standards, antidiscrimination and anticorruption policies, and protecting the environment. The Code of Conduct is available in the most relevant languages for our suppliers and integrated into

electronic ordering systems and purchasing conditions across the Group. We revised our Supplier Code of Conduct in 2021 and added our expectations around the procurement of conflict minerals (tin, tantalum, tungsten, their ores and gold). Around 5,900 new suppliers committed to the Code of Conduct in 2021.

BASF conducts audits and assessments to ensure that suppliers comply with the applicable laws, rules and standards. BASF reserves the right to discontinue business relationships for non-adherence to international principles. The same applies to failure to correct violations, or for displaying patterns of non-compliance with these standards. Our Code of Conduct expressly points out that potential violations of laws, rules or standards can be reported – including anonymously – to our compliance hotlines. Each case is documented and investigated, and appropriate measures are taken as necessary.

Selection and evaluation of our suppliers

New suppliers are selected and existing suppliers are evaluated not only on the basis of economic criteria, but also ESG standards. As such, selection, evaluation and auditing is an important part of our sustainable supply chain management. Processes and responsibilities are defined in a global guideline. Due to the large number of suppliers, they are **evaluated based on risk**. We take into account the materiality of the supply relationship and country and industry-specific risks. We also use observations from our employees in procurement and information from internal and external databases, such as TfS assessments.

We have suppliers with a high potential sustainability risk evaluated by third parties, either through sustainability evaluations or on-site audits. The list of suppliers to be assessed is updated every year. Sustainability evaluations and on-site audits are mainly conducted according to the TfS framework. A total of 86 raw material supplier sites were audited on sustainability standards on our behalf in 2021.

Good to know



Together for Sustainability (TfS)

BASF is a founding member of Together for Sustainability (TfS). The initiative was established in 2011 to improve sustainability in the supply chain. The focus is on standardizing and simplifying supplier audits and evaluations globally. This increases transparency and creates synergies: Suppliers only have to complete an assessment process once. The results are then made available to all TfS members and are mutually recognized – saving time and money for both parties. Suppliers are evaluated by independent experts either in on-site audits or online assessments. The latter are conducted by EcoVadis, a ratings agency specialized in sustainability analyses.

A new program on Scope 3 emissions was launched in 2021. The aim is to develop a methodology for the chemical industry to calculate upstream greenhouse gas emissions in particular. TfS members can use this data to implement and manage emissions reduction programs.

At the end of 2021, TfS had 34 members with a combined procurement spend of around €267 billion. A total of 284 audits and 5,817 online assessments were performed. As a TfS member, BASF itself is assessed and in 2021 was ranked among the top 1% companies worldwide in the sustainable procurement category.

For more information on Together for Sustainability, see tfs-initiative.com

¹ "Local" means that a supplier is located in the same region (according to BASF's definition) as the procuring company.

We received sustainability evaluations for 701 suppliers. We also take into account other certification systems and external audits, such as from the Roundtable on Sustainable Palm Oil, when assessing our suppliers. Depending on business requirements, we additionally conduct our own Responsible Care audits at selected suppliers (see page 117).

Audit results

We carefully analyze the results of our assessments and document them in a central database. The on-site supplier audits conducted over the past few years have identified some need for adjustment with respect to environmental, social and corporate governance standards, for example in waste management or deviations in occupational health and safety measures and standards under labor law. Follow-up audits in 2021 identified improvements, for example, a reduction in health and safety risks following the implementation of appropriate measures and compliance with labor law requirements. In 2021, none of our audits identified any instances of child labor or dangerous work and overtime performed by persons under 18.

We maintained close dialog with our South African platinum supplier Sibanye-Stillwater¹ in 2021 on the results of the audit from 2020, the implementation of the resulting action plan, and other relevant topics. This includes working with all stakeholders, including local authorities, to take a unified approach to community development. Almost all the needs for adjustment identified by the audit had been implemented by the end of 2021. BASF and Sibanye-Stillwater continue to discuss the progress made four times a year and also use this as a platform for dialog on other sustainability topics. Sibanye-Stillwater is a member and supporter of the International Platinum Group Metals Association (IPA) sustainability initiative that was co-founded by BASF. The initiative's measures include conducting comprehensive sustainability audits and sharing factors for success. BASF continued its regular dialog with local stakeholder

groups in 2021. It also facilitated direct dialog between Sibanye-Stillwater and nongovernmental organizations active in this area.

We discuss sustainability matters with our supplier Nornickel and other aspects relevant to our cooperation on a monthly basis. These include current events and the findings from the mining-specific TfS audits. In 2021, TfS audits were carried out at Nornickel's site in Polar, Russia. Nornickel seeks to join various industry initiatives that provide third-party verification of mining and responsible procurement standards, such as the International Council on Mining and Metals (ICMM) or the Initiative for Responsible Mining Assurance (IRMA). In addition, topics relevant to stakeholders were discussed in meetings with interest groups. The dialogs continue in various forms.

Supplier development

We use TfS evaluations to pursue a risk-based approach with clearly defined, BASF-specific follow-up processes. If we identify deviations from standards, we ask suppliers to develop and implement **corrective measures** within a reasonable time frame. We support them in their efforts, for example by training employees from 31 suppliers in China on ESG topics in 2021 as part of a partnership with the East China University of Science and Technology. In South America, around 190 suppliers took part in a diversity talk on gender equality in the supply chain, and around 340 suppliers attended a webinar on ethical principles, legislation and human rights in the supply chain.

As part of TfS, training was also developed for suppliers undergoing a sustainability evaluation for the first time and for suppliers that already have a sustainability rating but have potential for improvement in ESG performance. In 2021, more than 1,800 participants attended online TfS training on this topic in different languages. TfS is also developing a global learning platform for buyers and suppliers, which will provide various (online) training opportunities on specific sustainability topics. It is scheduled for launch in 2022.

We review our suppliers' progress according to a defined timeframe based on the sustainability risk identified, or after five years at the latest. In the case of ongoing, serious violations of the standards defined in our Supplier Code of Conduct or international principles, we reserve the right to impose commercial sanctions. These can go as far as termination of the business relationship. In 2021, this happened in three cases.

¹ In 2012, an extended strike at a platinum mine in Marikana, South Africa, culminated in a violent confrontation between mine workers and armed South African police. Employees of the former mine operator, Lonmin, were among the fatalities. Ownership of the Marikana mine was transferred to Sibanye-Stillwater in 2019. For more information on the supplier relationship with the Sibanye-Stillwater mine, see [basf.com/en/marikana](https://www.basf.com/en/marikana)

Raw Materials

GRI 102, 103, 203, 301, 304, 308, 413, 414



In 2021, BASF purchased a total of around 35,000 different raw materials from more than 6,500 suppliers. Using resources as efficiently and responsibly as possible and the concept of the circular economy are firmly embedded in our strategy and our actions, for example, by our Verbund structure and the increased use of renewable and recycled feedstocks. We expect our suppliers to source and produce raw materials responsibly.

At a glance

35,000
different raw materials
purchased

1.3 million
metric tons
renewable raw materials
purchased

- BASF's Verbund concept enables the efficient use of resources
- Recycled and renewable raw materials are gaining in importance
- Numerous projects to improve supply chain sustainability

Strategy

Our strategy covers the entire value chain – from responsible procurement and the efficient use and recycling of raw materials in our processes to developing resource-saving solutions for our customers. We want to decouple **growth from resource consumption** with process and product innovations to accelerate the shift toward closed-loop value creation systems. Alongside economic, environmental and social criteria, we also consider aspects such as product safety and supply security when selecting suppliers and raw materials.

Our expectations of our suppliers are laid down in our Supplier Code of Conduct (see page 109). We take a closer look at suppliers in critical supply chains, for example mineral raw materials, renewable resources such as palm kernel oil, a number of pigments and highly toxic substances. Upstream stages of the value chain are assessed for serious sustainability risks and, if necessary, suitable remedial measures are identified. In addition, we develop and test approaches to make the supply of raw materials more sustainable in joint initiatives with suppliers and other partners. Examples include our cooperative ventures and investments to recycle batteries (see page 30) and our joint activities on certified sustainable supply chains for renewable raw materials such as palm, palm kernel and castor oil.

BASF's Verbund concept is key to making the use of raw materials in our own processes as efficient as possible: Intelligently linking and steering our plants and processes creates efficient value chains. By-products from one facility are used as feedstocks elsewhere. This saves raw materials and energy (see page 128). At the same time, the Verbund offers many opportunities to use renewable and recycled raw materials. We want to better leverage this potential going forward. For example, we are driving forward chemical recycling of mixed plastic waste and used tires in our ChemCycling™ project (see page 115).

Resource efficiency and stewardship are also becoming increasingly important topics for our customers. That is why we are constantly working to reduce the resources consumed in the manufacturing of our products, for example through more efficient processes, innovative technologies and the use of renewable and recycled raw materials. This enables us to offer our customers solutions that make a greater contribution to sustainability, like a smaller carbon footprint and better biodegradability. Our products also improve our customers' resource efficiency and sustainability in many areas. For example, BASF additives increase the service life and mechanical

recyclability of plastics, which saves fossil resources and avoids CO₂ emissions.

For more information on our supplier management, see page 109 onward

For more information on the circular economy, see page 44

Fossil and petrochemical resources

BASF's most important raw materials (based on volume) include gas and crude oil-based petrochemical products such as naphtha and benzene. We mainly use liquid gas and natural gas to generate energy and steam, and to produce key basic chemicals such as ammonia or acetylene. Naphtha is mainly fed into our steam cracker, where it is split into products such as ethylene and propylene – both important feedstocks for numerous value chains. We use aromatics such as benzene or toluene to manufacture engineering plastics, among other products. Thanks to a high degree of forward and backward integration, we can produce many feedstocks for our value chains efficiently while conserving resources within the BASF Verbund. This increases supply security and reduces dependence on external supply sources to just a few key raw materials. We source these from different suppliers to minimize supply risks.

As part of our efforts to improve sustainability, we are continuously investigating whether fossil and petrochemical resources can be replaced with **non-fossil alternatives**. We carefully consider economic, environmental and social aspects, as well as other important criteria like supply security and product safety. Our aim is to increase the share of renewable and recycled feedstocks in our value chains. This brings with it challenges and compromises in the supply of both energy and resources for carbon-based organic chemistry. For example, the use of renewable energy can involve additional costs, which can have an impact on competitiveness. Another area of conflict arises, for example, when the increased consumption of renewable raw materials leads to greater land use. We raise awareness of these trade-offs through close dialog with our stakeholders. We are also involved in sustainability initiatives to develop and implement solutions in cooperation with partners.

Good to know



The mass balance approach

Many BASF value chains start in syngas plants or steam crackers, where fossil resources, mostly natural gas and naphtha, are converted into hydrogen and carbon monoxide or important basic chemicals such as ethylene and propylene. These are used to create thousands of products in the BASF Verbund. Alongside fossil resources, bio-based and recycled raw materials such as biomethane, bio-naphtha or pyrolysis oil can be used as feedstocks in our plants. Due to the simultaneous processing of fossil, bio-based and recycled feedstocks, the raw materials cannot be directly assigned to resulting derivatives. The share of bio-based or recycled raw materials can however be allocated to derivatives using the mass balance approach, which is audited by a third party, and certification (such as the REDcert² standard for the chemical industry). It is similar in principle to green power, which has been established for many years: Energy from renewable sources is fed into the grid and then charged to individual customers.

Mass balance products are identical in quality to conventionally produced products but have a better sustainability balance due to the use of bio-based or recycled raw materials. This method has already been applied to over 700 BASF products (2020: ~200 products), for example, engineering plastics such as polyamide, superabsorbents, dispersions and intermediates. We share our expertise in numerous stakeholder platforms, such as the European Commission's Circular Plastics Alliance, to harmonize and standardize different allocation methods and certification schemes for mass balance products.

 For more information, see basf.com/massbalance

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. For instance, we use renewable resources to produce ingredients for the detergent and cleaner industry, or to source natural active ingredients for the cosmetics industry. We also use renewable feedstocks such as biomethane and bio-naphtha in our Verbund as an alternative to fossil resources. The mass balance approach allows us to allocate the amount of renewable resources used to a wide variety of end products (see box at left). Examples include the Acronal[®] Eco and Joncryl[®] MB biomass balance binders for solvent-free paints and coatings, the HySorb[®] Biomass Balanced superabsorbent, various biomass balance versions from the Trilon[®], Sokalan[®] and Protectol[®] product lines for the detergent and cleaner industry, and the biomass balance versions of our Styropor[®], Neopor[®] and Styrodur[®] insulation materials.

As for fossil raw materials, we also consider how renewable resources **impact sustainability topics** along the value chain. Alongside positive effects like saving greenhouse gas emissions, these can also have negative effects on areas such as biodiversity, land use or working conditions, depending on the raw material. This is why we carefully weigh the advantages and disadvantages of using renewable resources, for example using Eco-Efficiency Analyses. We also take recognized certification standards such as the Roundtable on Sustainable Palm Oil into account in our decisions.

We want to minimize raw material-specific risks and increase sustainability in our supply chains with measures, projects and targeted involvement in initiatives. Our activities here concentrate on value chains that are relevant quantitatively or that do not yet have certification standards. We are also working on product innovations and on enhancing our production processes to improve the profitability and competitiveness of renewable resources. For example, we are developing innovative processes such as biocatalysis and fermentation for the production of vitamins and enzymes; and we are

driving forward white biotechnology for the production of chemical components from renewable resources.

Palm oil, palm kernel oil and their derivatives are some of our most important renewable raw materials. We mainly use these raw materials to produce ingredients for the cosmetics, detergent, cleaner and food industries. We aim to ensure that palm-based raw materials come from certified sustainable sources. To this end, we have endorsed the Roundtable on Sustainable Palm Oil (RSPO) since 2004 and are engaged in other national and international initiatives, such as the German Forum for Sustainable Palm Oil, the Polish coalition Polska Koalicja ds. Zrównowazonego Oleju Palmowego and the High Carbon Stock Approach organization. Based on our Group-wide Supplier Code of Conduct (see page 109), we have outlined our expectations of suppliers in the palm-based value chain in an additional sourcing policy (BASF Palm Sourcing Policy). This addresses aspects such as forest and peat conservation, respect of human and labor rights, smallholder inclusion, and certification and traceability standards. The annual BASF Palm Progress Report reports on our measures and progress toward more sustainability and transparency in the value chain.

We purchased 242,946 metric tons of palm oil and palm kernel oil in 2021 (2020: 227,213 metric tons). We again met our own voluntary commitment to source only RSPO-certified palm oil and palm kernel oil. This avoided more than 330,000 metric tons of CO₂ emissions compared with the procurement of conventional palm oil and palm kernel oil. By 2025, we aim to extend our voluntary commitment to sustainable procurement to the main intermediate products¹ based on palm oil and palm kernel oil. We were able to trace 96% of our global palm footprint to oil mill level as of the end of 2021 (2020: 95%²). In addition, we continued to drive forward the RSPO supply chain certification of our sites for cosmetic ingredients. At the end of 2021, 26 production sites worldwide were certified by the RSPO (2020: 25). In line with raised awareness for sustainability, we continue to see growing demand for certified palm-based products from our customers. We are expanding our range of certified

sustainable products in accordance with the RSPO's mass balance supply chain model. This helps our customers meet their obligations to customers, consumers and stakeholders.

We source most of our palm-based raw materials from Malaysia and Indonesia. Smallholders account for around one-third of the total volumes produced there. We have worked together with The Estée Lauder Companies, the RSPO and Solidaridad in Indonesia since 2019 to expand our supplier base for RSPO-certified palm oil products while strengthening smallholder structures and sustainable production methods at local level. The project in the province of Lampung supports around 1,000 independent smallholders in improving their livelihoods and the sustainable production of palm oil and palm kernel oil. The focus is on efficient and sustainable farming practices and health and safety standards. The goal is for at least one-third of program participants to become certified according to the RSPO Smallholder Standard in three years.

Also important for BASF, albeit at a much smaller scale, is **castor oil**. We use castor oil to manufacture products such as plastics and ingredients for paints and coatings, as well as products for the cosmetics and pharmaceutical industries. With the aim of establishing a certified sustainable supply chain for castor oil, we launched the Sustainable Castor Initiative – Pragati in 2016 together with the companies Arkema and Jayant Agro and the NGO Solidaridad. The initiative is intended to improve the economic situation of castor bean farmers in India and, at the same time, raise awareness of sustainable farming methods. Around 80% of the world's castor beans are produced in India, mainly by smallholders. As part of Pragati, smallholder farmers receive training on topics such as cultivation methods, efficient water use, health and the safe use of crop protection products based on a specially developed sustainability code, SuCCESS. Since the project was initiated, more than 5,800 smallholders and over 13,300 hectares of land have been certified for sustainable castor cultivation. Yields from this land were 35% higher than average amounts for the region published by the local government for the 2020/2021 harvest cycle. In addition to

SUCCESS, the Sustainable Castor Association (SCA), which was launched in 2019 by the founders of the Pragati initiative, has also developed a sustainability code for the wider supply chain. This will allow castor beans obtained from the program to be further processed into certified castor oil and derivatives and to be introduced into the downstream supply chain. We were able to source the first certified sustainable castor oil from the program in 2021 following the successful audit of our supply chain by an independent certification body. In the coming years, we want to increase the share of this oil in our total demand.

Our **bioactives for cosmetics** are based on plants. Through sustainable sourcing practices, we aim to preserve ecosystems and enable sustainable management for those who depend on them. To this end, we have set up various programs that unite economic, ecological and social aspects in holistic approaches. One example is our rambutan program in Vietnam's Dong Nai province. We have been collaborating since 2014 with two local small plantations which supply us with sustainably produced, organically certified raw materials. Upcycling the rambutan tree's shells, leaves and seeds, previously disposed of as waste, creates new income streams for farmers and expands our portfolio of natural active ingredients. The partnership focuses in particular on responsible farming practices and social inclusion, including gender equality, safe working conditions and fair incomes.

Another example of sustainable supply chains and responsible innovation is our Castaline™ product, derived from the leaves of chestnut trees. These are harvested in late summer by forest owners in France. The chestnut forests are organically certified and are mainly used for the cultivation of chestnuts. By upcycling the leaves as a by-product of chestnut extraction, we generate additional income opportunities for forest owners and provide our customers with a product of completely natural origin. We are pursuing other similar

¹ Fractions and primary oleochemical derivatives as well as vegetable oil esters

² The figure for 2020 was adjusted from 96% to 95% due to a data correction.

initiatives, for example, in Morocco for our argan-based products, and in India for our active ingredients based on the moringa tree.

For more information on biodiversity, see page 138 onward

For more information on our voluntary commitment to palm oil products and the Palm Progress Report, see basf.com/en/palm-dialog

Recycled feedstocks

Recycling is becoming increasingly important due to limited resources, growing sustainability requirements in the markets and regulatory developments. We want to increase the use of recycled feedstocks with our Circular Economy Program: From 2025 onward, we aim to process around 250,000 metric tons of recycled and waste-based raw materials every year worldwide, replacing fossil raw materials (see page 44).

A focal point of our activities here is **chemically recycling** plastic waste. This technology complements mechanical recycling and can help to reduce the amount of plastic waste that is disposed of in landfill or thermally recovered. Chemical recycling breaks down plastics into their building blocks or converts them into basic chemicals. Different methods are used to achieve this.

In our ChemCycling™ project, our technology partners use the pyrolysis process to extract pyrolysis oil from mixed plastic waste or used tires, which were not previously recycled. We can feed this pyrolysis oil into our Verbund as an alternative to fossil raw materials and use it to make new products. These have exactly the same properties as products manufactured from fossil feedstocks. We use a certified mass balance approach to allocate the percentage of recycled content to the end product (see page 113). In 2021, we were able to further expand our portfolio of these Cycled™ products. It now comprises around 50 products that our customers use, for example to manufacture transport cases for medicine, high-performance plastics for the automotive industry, packaging materials and functional textiles. We also signed a memorandum of understanding in 2021 with our technology partner Quantafuel and Remondis, a global leader in waste and water management. Its

subject matter is the assessment of a joint investment in a pyrolysis plant for plastic waste.

We have also made further progress with the chemical recycling of used mattresses made of flexible polyurethane. It is based on a wet chemical process developed by BASF. After initial successful trials, our teams continued developing the process in 2021. Precursors recovered from old mattresses can now be used to produce new mattress-sized blocks of flexible polyurethane foam. The new process is currently being optimized and tested on a larger scale.

We have many years of experience and a high degree of specialization in **recycling precious metals** such as platinum, palladium and rhodium. They are used in automotive catalysts as well as in process and chemical catalysts. We primarily use the precious metals recovered in this way as feedstocks in catalyst production. With the expansion of our refinery plant in Seneca, South Carolina, and the acquisition of assets from Zodiac Enterprises in Caldwell, Texas, we are further expanding our leading position in platinum group metal recycling.

The growing demand for electromobility is also increasing the need for **lithium-ion battery recycling**. As a leading producer of battery materials with future local production capacities in the three main markets – Asia, Europe and North America – BASF has in-depth expertise in battery chemistry and process technology. We are utilizing these competencies to address battery recycling as an additional growth market in cooperation with partners along the value chain (see page 30). In this way, we want to ensure that valuable metals remain in the production cycle for as long as possible. This conserves resources while enabling production of cathode active materials in Europe with a significantly lower carbon footprint compared with the industrial standard. At the Schwarzheide site in Germany, where a cathode active materials plant is already under construction, we will also build a prototype plant for battery recycling by 2023. The prototype plant will allow for the development of new operating procedures and optimization of technology to deliver superior recovery rates of lithium, nickel, cobalt and manganese from end-of-life lithium-ion batteries. The plant will also recycle

metals from scrap of cell manufacturers and battery material producers that do not meet product specifications.

For more information on the circular economy, see page 44

Mineral raw materials

We procure a number of mineral raw materials, which we use to produce automotive and process catalysts or battery materials, among other products. We are continually improving our products and processes to minimize the use of primary mineral raw materials. At the same time, we are driving forward the recycling of mineral raw materials, for example, by recovering platinum metals from automotive and process catalysts and using these as secondary resources (see “Recycled feedstocks”).

Sourcing mineral raw materials responsibly is important to BASF. We implemented measures to meet the requirements of the E.U. Conflict Minerals Regulation by the January 1, 2021 deadline. This defines supply chain due diligence for tin, tantalum, tungsten, their ores and gold (3TG) imported into the E.U. from conflict-affected and high-risk areas (CAHRAs). To supplement our Supplier Code of Conduct (see page 109), we introduced a Group-wide **Supply Chain Policy for Conflict Minerals** in 2021. It contains expectations for our suppliers from CAHRAs and outlines voluntary commitments.

In addition to responsible procurement of the 3TG minerals, BASF is committed to responsible and sustainable global supply chains for other mineral raw materials as well. These include **cobalt**, a key component in the production of battery materials for electric vehicles, among other applications. Our cobalt supply chain is organized according to special sustainability criteria. Our goal is to not purchase cobalt from artisanal mines and to exclude this in supply chains as long as responsible artisanal production cannot be verified.

Together with BMW, Samsung SDI, Samsung Electronics, Volkswagen and the German Agency for International Cooperation (GIZ), we have been involved in the cross-industry **Cobalt for Development initiative** since 2018. It aims to improve working and living

conditions for artisanal miners in the Democratic Republic of Congo. To achieve this, the initiative offers programs such as training on important environmental, social and governance aspects of responsible mining practices. Since October 2020, 14 mining cooperatives in Kolwezi have participated in training on topics such as occupational safety and environmental management. Cobalt for Development also works closely with local NGOs and the Good Shepherd International Foundation to create additional income opportunities for families and improve access to education. The joint activities are beginning to show results according to an evaluation of the initiative: Participants of the program since its launch have seen an increase in average income and savings. Since construction of the new public primary and secondary schools in Kisote, the majority of children have enrolled in school. Overall, several thousand members of the participating communities are already benefiting. In 2021, the initiative also made an action pledge to eliminate child labor as part of a global campaign by the International Labor Organization (ILO). Three mining cooperatives around Kolwezi are receiving assistance to implement occupational safety measures and a zero-tolerance policy against child labor.

We signed a long-term supply agreement with Nornickel for nickel and cobalt from a metal refinery in Finland. The agreement ensures locally sourced and secure supply of raw materials for battery material production in Europe. In cooperation with Eramet, we are also assessing the development of a state-of-the-art hydrometallurgical refining complex in Indonesia, which is expected to secure access to more sustainably sourced nickel and cobalt as of the mid-2020s.

We are also involved in various international initiatives to strengthen sustainability and innovation in the value chain for batteries. These include the **Global Battery Alliance** (GBA), which we co-founded in 2017. It promotes dialog between business, government and civil society and develops standards and tools to create a socially responsible, ecological and economically sustainable, and innovative value chain for batteries. For instance, BASF is working with the GBA on the GBA Battery Passport. In the future, this “digital twin” will contain information on the sustainability of a battery to increase transparency in the value chain. The GBA, as well, made an action

pledge with the ILO campaign against child labor, also focusing on the Democratic Republic of Congo. BASF is also an active member of the Responsible Minerals Initiative.

Furthermore, together with Daimler, Fairphone, and Volkswagen, we launched the **Responsible Lithium Partnership** in 2021. It advocates for the responsible use of natural resources in Chile's Salar de Atacama, home to the world's largest lithium reserves and a significant portion of global production. As a first step, the German Agency for International Cooperation (GIZ) was commissioned to organize a local multi-stakeholder platform on the opportunities and risks of lithium mining and other economic activities such as copper mining and tourism. The goal of the platform is to reach a common understanding on the status quo and to jointly develop a vision for the future of the Salar de Atacama watershed. In addition, potential risks are to be mitigated and opportunities promoted through the development and implementation of joint action plans.

Another mineral raw material that BASF processes is **mica**. We use both raw mica and effect pigments derived from mica, mainly in the production of coatings. BASF is conscious of its social responsibility with regard to mica sourcing and applies high standards which, among other things, exclude child labor. Suppliers are asked to source mica in accordance with our Supplier Code of Conduct. As a member of the Responsible Mica Initiative (RMI), we advocate for the eradication of child labor and unacceptable working conditions, specifically in India's mica supply chain. The initiative focuses on labor standards, strengthening local communities and legal frameworks. According to an RMI study, activities in the relevant regions of India have already led to improved income and living conditions. These include improved access to clean drinking water through the installation of pumps and filtration systems and improved access to health care through doctors' visits in villages and enrollment in public health insurance plans.

For more information on the Cobalt for Development project, see basf.com/cobalt-initiative and cobalt4development.com/

For more information on the Global Battery Alliance, see globalbattery.org

For more information on the Responsible Mica Initiative, see responsible-mica-initiative.com

We Produce Safely and Efficiently

Protecting people and the environment is our top priority. Our core business – the development, production, processing and transportation of chemicals – demands a responsible approach. We address environmental, health and safety risks with a comprehensive Responsible Care Management System. We expect our employees and partners to know the risks of working with our products, substances and plants and to handle these responsibly.

In this section:
 EHSQ Management Systems
 Health and Safety, Emergency Response
 Product Safety
 Transportation Safety
 Energy and Climate Protection
 Emissions to Air, Waste and Remediation
 Water
 Biodiversity

Our Management Systems

GRI 102, 103, 303, 305, 306, 307, 403, 410, 418



BASF is actively involved in the International Council of Chemical Associations' global Responsible Care® initiative. We reaffirmed our commitment to the guiding principles of the initiative and the Responsible Care® Global Charter in 2021. Our Responsible Care Management System comprises the global directives, standards and procedures for environmental protection, health and safety (EHS). At the same time, our Quality Management System ensures the high quality of our products, processes and services, and enables our employees to best meet our customers' needs.

At a glance

143 audits
to monitor performance and progress

€239 million
invested in environmental protection plants and facilities

- Global EHS guidelines and standards
- Quality management with a focus on customer satisfaction
- Risk-based site audits

Responsible Care Management System

Our EHS management approach covers the different stages of our value chain – from the transportation of raw materials to production at our plants, activities at our sites and warehouses, and distribution of our products down to our customers' application of our products. The Environmental Protection, Health & Safety unit in the Corporate Center defines Group-wide management and control systems and monitors compliance with internal requirements and legal regulations, while the sites and legal entities implement these requirements locally. Our global network ensures that information and insights are shared across the BASF Group on an ongoing basis. Our policies and requirements are continuously updated. We also maintain dialog with government institutions, associations and international organizations for this reason. We set ourselves ambitious goals for environmental protection, health and safety (see page 36) and regularly review our performance and progress with audits. We assess the potential risks and weaknesses of all our activities – from research and production to logistics – and the potential effects of these on the safety and security of our employees, the environment or our surroundings. We use databases to document accidents, near misses and safety-related incidents at our sites as well as along our transportation routes to learn from these; appropriate measures are derived according to specific cause analyses.

Quality Management System

Our Quality Management System comprises our EHSQ policy as well as further standards, guidelines and processes for quality management along the value chain. Our Quality Management System is risk-based, process-oriented and focused on customer satisfaction. Its mandatory elements are set out in a Corporate Requirement. These include core processes such as nonconformance management, change management and the performance of internal audits. Local implementation of the requirements is the responsibility of our business units and sites.

Responsible Care audits

Regular audits help ensure that our safety, security, health and environmental protection standards are met. We conduct regular audits every three to six years at all BASF sites and at companies in which BASF is a majority shareholder. We take a **risk-based approach** and use an audit database to ensure that all sites and plants worldwide are regularly audited. We have defined our regulations for Responsible Care audits in a global Corporate Requirement.

Newly acquired sites and companies are audited after the integration phase is complete, generally within one to two years depending on complexity and size.

During our audits, we create a **safety and environmental profile** that shows if we are properly addressing the existing hazard potential. If this is not the case, we agree on measures and monitor their implementation, for example, with follow-up audits.

In the BASF Group in 2021, 143 environmental and safety audits were conducted at 71 sites (2020: 112 audits at 60 sites). The sites were audited based on their individual risk profile. Auditing of the sites acquired from Solvay could not start in late 2021 as planned due to the coronavirus pandemic. These audits will be performed in 2022.

In 2021, 13 sites were audited on **occupational medicine and health protection** (2020: 1). Online audits were conducted for 10 of these sites. These remote audits focused on documented processes and management systems.

[📄](#) For more information on occupational health and safety, see page 119 onward

[🌐](#) For more information on Responsible Care®, see basf.com/en/responsible-care

External certification

We pursue a decentralized **certification approach** for our business units and subsidiaries. This takes into account local needs, internal and legal requirements, and our customers' requirements.

Our Responsible Care audit system complies with the ISO 19011 standard and is certified according to ISO 9001. Worldwide, 130 BASF production sites are certified in accordance with ISO 14001 and EMAS (Eco-Management and Audit Scheme) (2020: 128). In addition, 54 sites worldwide are certified in accordance with OHSAS 18001 or ISO 45001 (2020: 51). Several BASF sites also have an ISO 17020 accredited inspection body for user inspection or an ISO 17025 accredited analytical laboratory for environmental emissions analyses.

Based on our customers' requirements, quality management at our production sites is generally certified according to external international standards such as ISO 9001, GMP, FAMI QS or IATF 16949.

Costs and provisions

We continuously invest in reducing the impact of our actions on the environment. We also establish appropriate provisions for environmental protection measures and the remediation of active and former sites.]

Costs and provisions for environmental protection in the BASF Group

Million €	2021	2020
Operating costs for environmental protection	1,133	1,125
Investments in new and improved environmental protection plants and facilities ^a	239	231
Provisions for environmental protection measures and remediation ^b	926	693

^a Investments comprise end-of-pipe measures as well as integrated environmental protection measures.

^b Values shown refer to December 31 of the respective year.

[📄](#) For more information, see Notes 9 and 23 on pages 224 and 260

Health and Safety, Emergency Response

GRI 102, 103, 403, 410, 413, 418



For occupational and process safety as well as corporate security and health and environmental protection, we rely on comprehensive preventive measures and expect the cooperation of all employees and contractors. Our safety and security concepts serve to protect our employees, contractors and neighbors, to prevent property and environmental damage, and to protect information and company assets.

At a glance

0.3
Lost-time injuries
per 200,000 working hours

0.3
Process safety incidents
per 200,000 working hours

- Global health and safety standards
- Strengthening risk awareness and mindful behavior
- Intensive dialog on safety topics
- Regular review of safety concepts, emergency systems and crisis management structures
- Comprehensive protection measures against third-party interference

Strategy

The safety of our employees, contractors and neighbors, and protecting the environment is our top priority. This is why we have set ourselves ambitious goals for occupational and process safety as well as health protection. We stipulate mandatory global standards for occupational and process safety, emergency response and health protection. Our sites and subsidiaries are responsible for implementing and complying with internal guidelines and legal

requirements. The Environmental Protection, Health & Safety unit in the Corporate Center conducts regular audits to monitor this. As part of our continuous improvement process, we regularly monitor progress toward our goals. We have defined our reporting indicators in accordance with the reporting standard developed by the International Council of Chemical Associations.

We promote **risk awareness** for every individual with measures such as systematic hazard assessments, specific and ongoing qualification measures and a wide range of safety initiatives. We analyze accidents and incidents as well as their causes and consequences in detail at a global level to learn from these. Hazard assessments and the risk minimization measures derived from them are an important prevention tool. We also promote regular dialog across different sites to strengthen risk awareness among our employees and contractors, to learn from examples of good practice and in this way, continually develop our safety culture.

Leaders are important role models for employees, which is why environmental protection, health, safety and security are discussed with newly appointed senior executives. Senior executives with a particular responsibility for such topics, for example, in production, also receive specific further training to be able to meet their responsibilities. Due to the restrictions caused by the coronavirus pandemic, the seminars for senior executives were held virtually in 2021. Other events and initiatives in 2021 also focused on the high relevance of safety topics and dialog among our leaders. These included regular town halls for senior executives, the Lead with Safety initiative in North America and the Visible Leadership in EHS @ CP initiative in the Petrochemicals division.

Numerous digital solutions and applications are used in BASF's production plants to further increase safety, security, planning capability and availability. For example, we had introduced augmented reality solutions at around 340 plants worldwide as of the end of 2021. We plan to implement these at more than 80 other plants by the end of 2022. At many sites, our employees already use mobile

end devices and special apps for day-to-day tasks such as safety inspections, which continuously improves the efficiency and quality of our processes. Other areas of application for digital solutions include efficiently simulating maintenance and production processes in digital plant models and predictive maintenance. At the Ludwigshafen site in Germany, for example, over 40 plants already use predictive maintenance models to monitor plant components such as compressors, pumps and heat exchangers.

Occupational safety

Our aim is to reduce the worldwide lost-time injury rate to no more than 0.1 per 200,000 working hours¹ by 2025. To prevent work-related accidents, we encourage and promote risk-conscious behavior and safe working practices, learning from incidents and regular dialog. We are constantly refining and enhancing our requirements and training.

2025 target

Reduce the worldwide
lost-time injury rate per
200,000 working hours

≤ 0.1

In addition to the legally required briefings, BASF requires new employees and contractors to complete compulsory **health and safety training**, as well as regular training on the safe handling of chemicals and the correct use of personal protective equipment for employees at our production sites. Due to the coronavirus pandemic, there was a greater focus on the safety aspects of remote working in 2021.

In 2021, 0.3 work-related accidents per 200,000 working hours¹ occurred at BASF sites worldwide (2020: 0.3). The share of chemical-related accidents declined slightly to 4% (2020: 6%).

¹ Hours worked by BASF employees, temporary employees and contractors

Unfortunately, there was one fatal work-related accident in 2021 (2020: 1). At the Geismar site in Louisiana, an employee of a contractor died while performing maintenance work. The accident is still being investigated by the local authorities. BASF is assisting the inquiry into the circumstances and cause of the accident. We use the findings to take appropriate measures to prevent this from happening again. Such measures include regular informational events and awareness-raising campaigns.

We actively share insights to further increase occupational safety and continually improve our processes and methods. For example, we evaluate trends in data, analyze accidents and potential incidents, and share knowledge and best practices within our global network of experts and as part of safety initiatives. We also seek dialog with government institutions and are actively involved in external occupational safety initiatives and networks around the world led, for example, by the European Chemical Industry Council (CEFIC) or national associations such as the German Chemical Industry Association or the American Chemistry Council.

For more information on occupational safety, see basf.com/occupational_safety

Process safety

Process safety is a core part of safe, effective and thus sustainable production. We meet high safety standards in the planning, construction and operation of our plants around the world. These meet and, in some cases, go beyond local legal requirements.

Our global guidelines provide the framework for the safe construction and operation of our plants as well as the protection of people and the environment. Our experts have developed a safety concept for every plant that considers the key aspects of safety, health and environmental protection – from plant design to the end of the production phase – and that sets out specific safety measures. Regular implementation checks ensure that all aspects of process safety comply with the safety concept and are always up to date.

2025 target

Reduction of worldwide process safety incidents per 200,000 working hours

≤ 0.1

In order to maintain the highest level of safety at our plants across their entire life cycles, we verify that our protection concepts, safety reviews and resulting safety measures have been carried out in all our plants at timely intervals based on risk potential. We regularly update our plants' safety and security concepts, taking into particular account new technological opportunities and regulatory developments.

We use the **number of process safety incidents (PSI)** per 200,000 working hours¹ as a reporting indicator. We have set ourselves the goal of reducing process safety incidents to a rate of no more than 0.1 per 200,000 working hours by 2025. In 2021, we recorded 0.3 process safety incidents per 200,000 working hours worldwide (2020: 0.3). We investigate every incident in detail, even under the constraints of the coronavirus pandemic, analyze causes and use the findings to derive suitable measures. We share the findings in our global network in the interest of continuous improvement.

Around the world, we promote the reduction of process safety incidents and improve risk awareness with a culture of dealing openly with mistakes and initiatives to foster dialog around safety risks. To reduce process safety incidents, we focus in particular on technical measures and on a leadership culture that places even greater emphasis on process safety, such as in the PM Global Safety Relay Race initiative in the Performance Materials division. Avoiding and detecting all leaks was again a key priority in 2021 with the Zero Loss of Containment Mindset initiative in North America and the Zero Leakage initiative in South America.

In addition, we are continually refining and expanding our training methods and offerings to **increase risk awareness**. Due to the

restrictions associated with the coronavirus pandemic, in-person seminars were again held as virtual meetings or taught using web-based applications in 2021.

We play an active role in improving process safety around the world in internal and external networks, through our involvement in organizations such as the International Council of Chemical Associations (ICCA), the European Process Safety Centre (EPSC) or the Center for Chemical Process Safety (CCPS), and by fostering dialog with government institutions.

For more information on process safety, see basf.com/process_safety

Health protection

Our global corporate health management serves to promote and maintain the health and productivity of our employees. Our occupational health standards are specified in a binding global requirement, the implementation of which is the responsibility of our sites and subsidiaries. They are supported in this task by a global network of experts. The Environmental Protection, Health & Safety unit in the Corporate Center conducts regular audits to monitor compliance with the standards.

We raise employee awareness of health topics with offerings tailored to specific target groups. The BASF health checks form the foundation of our global health promotion program and are offered to employees at regular intervals.

We measure our **performance in health protection** using the Health Performance Index (HPI). This has five components: recognized occupational diseases, medical emergency drills, first aid, preventive medicine and health promotion. Each component contributes a maximum of 0.2 to the total score, meaning that the highest possible score is 1.0. We aim to reach a value of more than 0.9 every year. With an HPI of 0.96, we once again reached this target in 2021 (2020: 0.92). As in 2020, the figure is slightly lower

¹ Hours worked by BASF employees, temporary employees and contractors

than in previous years due to the coronavirus pandemic. Consequently, a number of criteria crucial to the HPI could not be fully met or measures could not be performed as usual in the reporting year. These included activities that required physical participation such as emergency drills, examinations or first aider training.

In 2021, 36 work-related illnesses among BASF employees worldwide were documented as recognized occupational diseases (2020: 26). The main recognized occupational diseases are occupational asthma, hearing loss, skin diseases, musculoskeletal disorders and cancer.

In 2021, we continued the **measures to fight the coronavirus pandemic** developed and successfully implemented at our sites in 2020, adapted to the local infection situation in each case. By sharing information in our BASF medical network and working closely together with the authorities, employee representatives and our partners at BASF sites, we were able to make and implement sound and timely decisions according to the situation. Our actions focused on the health of all of our employees, contractors and third parties. Measures included providing information to and raising awareness among employees, tracing and breaking infection chains, and vaccination services. For example, we set up our own coronavirus vaccination center at our largest site in Ludwigshafen, Germany. More than 22,000 primary vaccinations and more than 21,000 secondary vaccinations were administered there from April to August 2021, and more than 10,000 booster vaccinations were administered in December to BASF employees, contractors and site partners. Another focus in 2021 was on influenza prevention. BASF employees could be vaccinated against the seasonal flu at many sites around the world, an offer that was very well received. At the Ludwigshafen site in Germany, for example, around 6,800 employees participated in the influenza vaccination campaign.

In light of the coronavirus pandemic, the **Global Health Campaign 2021** was again devoted to the personal health of our employees. The program included a wide range of in-person and virtual

seminars and interactive events on regeneration under the banner of “Recharge yourself.” Focus topics were physical activity, nutrition and relaxation. Over 444 sites worldwide took part, offering events such as workshops, courses, lectures or exercises.

In October 2021, BASF SE's Corporate Health Management unit received the European Responsible Care® Award from the European Chemical Industry Council (CEFIC) in the category “Supporting health in COVID-19 times” for its wide-ranging activities and innovative approaches to fight the coronavirus pandemic – bundled under the motto of “Protect yourself and others.”

 For more information on occupational medicine, health campaigns and the HPI, see basf.com/health

Emergency response, corporate and cyber security

We create working conditions and an environment in which our employees can work safely. The focus of our **emergency and crisis management** is therefore on the safety of our employees, plants and sites as well as our communities. We are well prepared at global, regional and local level for exceptional situations such as major incidents or pandemics thanks to our extensive regulations and measures for emergency preparedness, emergency response and crisis management. All incidents are carefully followed up on to identify potential for improvement, which is integrated into existing concepts as needed. Unusual incidents are recorded and reported centrally in accordance with a standard Group-wide procedure (e-Rapid Incident Report). This enables us to identify risks at an early stage and, if necessary, initiate appropriate relief and communication measures.

Incidents are initially handled by the local crisis organization or local emergency response team. We have implemented precautionary organizational measures with clearly defined responsibilities and procedures at all sites for this purpose. The responsible persons receive regular training. Depending on the situation, we also involve business partners and our sites' communities, such as local

authorities or neighboring companies. Additional teams may be called in depending on the extent of the damage and how it develops.

For example, the Global Crisis Management Support Team (GCMS), led by a member of the Board of Executive Directors, was activated in connection with the coronavirus pandemic. It provides the strategic direction for crisis management and is supported by issue-specific and specialist working groups.

Safety and emergency drills are also conducted regularly at site and Group level. The number of employees and partners involved varies depending on the type of exercise.

We are actively involved in external networks, which quickly provide information and assistance in emergencies. These include the International Chemical and Environmental (ICE) initiative and the German Transport Accident Information and Emergency Response System (TUIS), in which BASF plays a coordinating role. In 2021, we provided assistance to public emergency response agencies and other companies in 138 cases (2020: 112). This included information on chemicals and their proper disposal, on-site operational support for transportation accidents involving hazardous goods, or information on human biomonitoring. We apply the experience we have gathered to improve our own processes and set up similar systems in other countries.

The **corporate security** requirements for site security are set out in a global guideline. Local implementation by our sites and subsidiaries is regularly audited and continuously improved. Respect for human rights is a mandatory element of our requirements. Aspects of human rights relevant to site security are a component of the global code of conduct and qualification requirements for our internal and external security personnel. We analyze the potential safety and security risks associated with investment projects and strategic plans, and define appropriate safety and security concepts. Our

guiding principle is to identify risks for the company at an early stage, assess them properly and derive appropriate safeguards.

We inform business travelers and transferees about appropriate protection measures prior to and during travel in countries with elevated security risks. We updated our travel recommendations in line with the coronavirus pandemic. After any major incident, we can use a standardized global travel system to locate and contact employees in the affected regions.

We protect our employees, sites, plants and company know-how against third-party interference. This includes addressing in depth the issue of **cybersecurity and information security**. BASF applies the “security by design” principle to critically review and optimize IT applications from a cybersecurity perspective as early as the design phase. We are continually improving our ability to prevent, detect and react to security incidents with various measures and training programs. Our global cybersecurity team monitors and protects our IT systems against hacker attacks. We cooperate with experts and partners in a global network to ensure that we can protect ourselves against cyberattacks as far as possible. Our IT security management system is certified according to DIN EN ISO/IEC 27001:2017. It also supports, in particular, our critical infrastructures in meeting additional compliance requirements such as DIN EN ISO/IEC 27019:2020, IT security catalog and corresponding industry-specific standards (B3S).

Around the world, we work to sensitize our employees about protecting information and know-how. We further strengthened our employees' awareness of risks in 2021 with mandatory, regular online training for all employees and complementary offerings such as seminars, case studies and interactive training. These increasingly addressed aspects of working practices that have changed as a result of the coronavirus pandemic, such as cybersecurity when working from home.

Our worldwide network of information protection officers comprises around 650 employees. They support the implementation of our uniform requirements and hold events and seminars on secure behaviors. Around 100,000 employees had been trained on the basics of cybersecurity and information protection in 2021. Our standardized Group-wide recommendations for the protection of information and knowledge were expanded to include additional guidance for employees and updated in line with current developments.

[For more information on emergency response, see \[basf.com/emergency_response\]\(https://www.basf.com/emergency_response\)](https://www.basf.com/emergency_response)

Good to know



Automation Security Roadmap

The advance of digitalization increases the risk of cyberattacks on IT systems such as online stores or servers. At the same time, automation technology (operational technology) is increasingly being used in production plants, buildings, laboratories and in logistics, which is also connected to the internet via various protection levels. An interdisciplinary team with experts from information and automation technology developed the Automation Security Roadmap to reduce risk in these areas. It serves as a guide for facilities to protect themselves against cyberattacks. Part of the concept is training Officers for Automation Security (OAS). BASF now has over 300 OASs. They provide advice and support on cybersecurity in automation technology at all BASF sites worldwide – for example, on risk analysis, protecting sensitive data and access control.

Product Safety

GRI 102, 103, 416, 417

SUPPLIERS

BASF

CUSTOMERS

We see product safety as an integral part of all business processes, as an element of our risk management, and as an important pillar of our commitment to Responsible Care®. We continuously work to ensure that our products pose no risk to people or the environment when they are used responsibly and in the manner intended. We aim to comply with all relevant national and international laws and regulations.

Strategy

We are committed to continuously minimizing the negative effects of our products on the environment, health and safety and to the ongoing optimization of our products. This commitment to product safety is enshrined in our Responsible Care® charter and the initiatives of the International Council of Chemical Associations (ICCA). Our products should not pose any risk to humans or the environment when used responsibly and in the manner intended. We aim to comply with all relevant national and international laws and regulations. Our **global requirements** define rules, processes and responsibilities, for example, to ensure uniformly high product safety standards worldwide. Our sites and subsidiaries are responsible for implementing and complying with internal guidelines and legal requirements. The Environmental Protection, Health & Safety unit in the Corporate Center conducts regular audits to monitor this. BASF's global network of experts shares information, insights and best practices around product safety on an ongoing basis.

We maintain and evaluate environmental, health and safety data for all of our substances and products in a **global database**. This information is continuously updated. The database forms the basis for substance and product assessments and for our safety data sheets, which we make available to our customers in around 40 languages. These include information on the physical/chemical, toxicological and ecotoxicological properties of products, potential hazards, first

aid measures, measures to be taken in the case of accidental release, and disposal. Our global emergency hotline network enables us to provide information around the clock. In order to help users to quickly find out about our products and the risks associated with them, we use the Globally Harmonized System (GHS) to classify and label our products around the world, provided this is legally permissible in the country concerned. We take into account any national or regional modifications within the GHS framework, such as the E.U.'s CLP Regulation.

We train our employees, customers and logistics partners worldwide on the proper handling and optimal use of selected products with particular hazard potential. Furthermore, in associations and together with other manufacturers, BASF is pushing for the establishment of voluntary global commitments to prevent the misuse of chemicals.

Global chemicals regulations

Most of the products we manufacture are subject to statutory chemicals regulations. We want to ensure compliance with these. We are bound by the relevant regional and national chemicals regulations, which continue to grow in number worldwide. Examples include REACH in the E.U., TSCA in the United States and KKDİK in Turkey. BASF Group companies work closely together with a global network of experts to ensure that BASF complies with the applicable regulations.

Environmental and toxicological testing

Before launching products on the market, we subject them to a variety of environmental and toxicological tests using state-of-the-art knowledge and technology. If we employ animal studies, we adhere to the specifications laid down by the German Animal Welfare Act as well as the requirements of the Association for Assessment and Accreditation of Laboratory Animal Care – the highest standard for laboratory animals in the world. We develop

and are continuously optimizing **alternative methods** to experimentally assess the safety and tolerance of our products without animal studies. Our aim is to replace, reduce and refine animal studies to minimize the impact on them. We made great progress toward this goal in 2021. For example, an animal-free toxicological testing strategy jointly developed by BASF and Givaudan was approved by the OECD – the first of its kind worldwide. The strategy comprises three individual alternative methods. By combining these methods, it is possible to test more precisely than in animal studies whether a substance causes allergic skin reactions.

Management of nano- and biotechnology

Nanotechnology and biotechnology offer solutions for key societal challenges – such as environmental and climate protection or health and nutrition. For example, nanomaterials can improve battery performance and biocatalytic methods can improve process resource efficiency. We want to harness the potential of both technologies. Using them safely and responsibly is our top priority. Safe handling of nanomaterials is stipulated in our Nanotechnology Code of Conduct, for instance. We produce a range of products with the help of biotechnological methods, including natural fragrances and flavors, enzymes, vitamins or seeds for agriculture. This provides us with extensive experience in their safe use in research, development and production. We are guided by the code of conduct set out by EuropaBio, the European biotechnology association, and want to adhere to all relevant standards and legal regulations governing production and marketing in our use of biotechnology.

Product Stewardship for Crop Protection Products and Seeds

GRI 102, 103, 416, 417



Crop protection products and seeds are highly regulated at national and international level, which brings with it strict requirements for registering and re-registering active ingredients and crop systems. Regulatory approval is only granted when extensive documentation can be provided showing that our products are safe for people, animals and the environment when used in the manner intended.

At a glance

- High regulatory requirements and safety standards for crop protection products and seeds
- Wide range of training on the safe and proper handling of our products

Potential risks are assessed and minimized throughout the research, development and registration process, and on an ongoing basis following market registration. We regularly perform a large number of scientific studies and tests to ensure that, as far as possible, our registration dossiers address all questions on potential environmental and health effects.

We adapt our portfolio to the specific requirements of regional markets as crops, soils, climate conditions, plant diseases and farming practices vary around the world. Consequently, product approvals differ from country to country.

Crop protection

BASF adheres to the International Code of Conduct issued by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) for the distribution of crop protection products. These are only marketed once they have been approved by the relevant authorities. We no longer sell WHO Class 1A or 1B products (high acute oral and dermal toxicity). Depending on availability, we offer our customers alternatives.

All of BASF's crop protection products can be used safely under local farming conditions if the information and directions on the label are followed. Customers can contact us directly if they have any questions, complaints or issues, for example, by calling the telephone number printed on product labels, using the contact forms on our websites or by approaching our sales employees directly. We record all products incidents relating to health or the environment that come to our attention in a global database. If necessary, we take appropriate measures on the basis of this information, such as updating the instructions for use on the product label to minimize preventable incidents in the future. We communicate changes to instructions for use and general recommendations on the safe use of our products through channels such as our Farmer Field School initiatives in Asia and in training programs such as the On Target Application Academy in the United States.

One of the ways we meet our commitment to product stewardship is by offering a wide range of courses and training on the safe storage and safe use of our products. In India, for example, BASF launched the Suraksha Hamesha program. Suraksha Hamesha means "safety all the time." The program creates a platform for educating farmers and agricultural workers about the nine steps of responsible use of crop protection products and personal protection. Through Suraksha Hamesha, BASF has engaged with over 162,600 agricultural workers and around 33,200 users across India since 2016. BASF also involves government agencies and the central government's farm extension teams in these meetings to support and promote farm safety.

We also work closely together with associations such as CropLife International and CropLife Europe to promote the safe and proper use of crop protection products. For example, we support stewardship initiatives of both associations and various programs on the proper disposal and recycling of product containers. Technological innovations developed together with industry partners such as the easyconnect closed transfer system in Europe or the Wisdom system in South America also help to make using crop protection products easier and safer.

Seeds

BASF is a member of Excellence Through Stewardship, a global industry initiative for seeds. This initiative promotes the adoption of quality management systems for seeds and product stewardship programs covering the entire life cycle. It also has independent ETS-certified auditors verify members' compliance with its guidelines. In 2021, BASF successfully passed ETS audits in the areas of laboratory operations, contained biotech plants, general stewardship, incident response management and product handling at our Ghent and Astene sites in Belgium.

[For more information on our Agricultural Solutions segment, see page 88 onward](#)

[For more information on biodiversity, see page 138 onward](#)

[For more information on risks from litigation and claims, see the Notes to the Consolidated Financial Statements on page 262](#)

Transportation Safety

GRI 102, 103, 306



Our regulations and measures for transportation safety cover the delivery of raw materials, the handling and distribution of chemical products between BASF sites, warehouses and customers, and the transportation of waste.

At a glance

Zero

transportation incidents with significant impact on the environment

- Risk minimization along the entire transportation chain
- Risk assessment based on national and international dangerous goods regulations
- Regular review of logistics service providers

Strategy

We want our products to be loaded, transported and handled safely. This is why we depend on global standards, an effective organization and reliable logistics partners. Our goal is to **minimize risks** along the entire transportation chain – from loading and transportation to unloading. The transportation of dangerous goods is subject to mandatory national and international dangerous goods regulations as well as our global guidelines. The sites and subsidiaries are responsible for implementing transportation safety regulations and guidelines. Compliance is regularly monitored by the Environmental Protection, Health & Safety unit in the Corporate Center using globally standardized transportation safety reviews.

External logistics partners are evaluated based risk either through assessments or on-site audits. BASF's global network of experts ensures that information, insights and best practices are shared on an ongoing basis.

Preventive safety measures

National and international dangerous goods regulations are based on an assessment of transportation risks and set out rules and measures for safely transporting dangerous goods. We use various tools to minimize transportation risks. For example, for every dangerous good to be transported, we check in each case whether the packaging is suitable for the type of transport. We conduct digital dangerous goods checks before shipping orders are released. In addition, vehicles are subjected to a thorough dangerous goods check prior to loading and rejected if there are any issues.

Above and beyond this, we use our global requirement to specifically assess the **safety and environmental risks** of transporting and handling raw materials and sales products with high hazard potential. This is based on the Guidance on Safety Risk Assessment for Chemical Transport Operations published by the European Chemical Industry Council (CEFIC).

We stipulate worldwide requirements for our logistics service providers and assess them in terms of safety and quality. Our experts use our own evaluation and monitoring tools as well as internationally approved schemes such as the ship inspection reports issued by the Chemical Distribution Institute (CDI) and the Oil Companies International Marine Forum (OCIMF).

Transportation incidents

To evaluate transportation safety, we systematically record transportation incidents according to defined criteria. We use the number of transportation incidents¹ as a reporting indicator. In 2021, we recorded 21 transportation incidents worldwide (2020: 19).

A particular focus is incidents involving goods spillages that could lead to significant environmental impacts. These include dangerous goods leaks of BASF products in excess of 200 kilograms on public traffic routes, provided BASF arranged the transport. We recorded three incidents in 2021 with spillage of more than 200 kilograms of dangerous goods² (2020: 2). None of these transportation incidents had a significant impact on the environment (2020: 0).

[For more information on transportation safety, see \[basf.com/distribution_safety\]\(https://www.basf.com/distribution_safety\)](https://www.basf.com/distribution_safety)

¹ Data is collected based on the International Council of Chemical Association's (ICCA) guidance for reporting performance and includes road, rail and container shipping incidents.

² Hazardous goods are classified in accordance with national and international hazardous goods regulations.

Energy and Climate Protection

GRI 102, 103, 201, 301, 302, 305



As an energy-intensive company, we take responsibility for the efficient use of energy and global climate protection. We are committed to the Paris Climate Agreement. Our innovative products enable a reduction in greenhouse gas emissions in many areas. At the same time, we are working to significantly reduce our own carbon footprint with our carbon management.

At a glance

20.2 million metric tons

Greenhouse gas emissions in 2021

2.4 TWh

Renewable energy

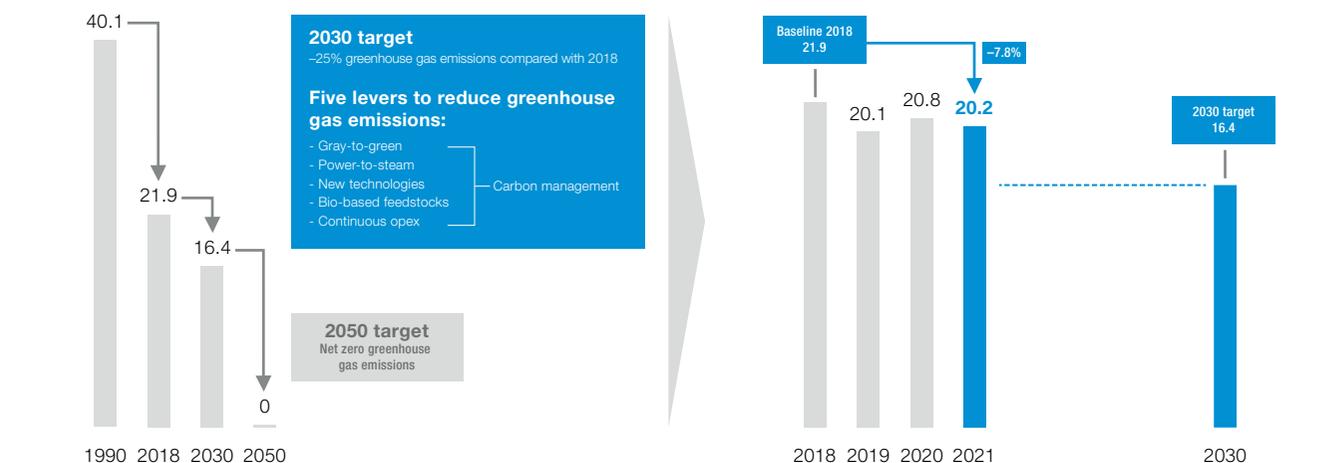
- Even more ambitious emission reduction targets
- New Net Zero Accelerator unit bundles and accelerates projects to achieve targets
- Corporate and product carbon footprints create transparency
- Supplier CO₂ Management Program

Strategy

Climate protection is very important to us and is an important part of our corporate strategy. We significantly raised our **climate protection targets** in 2021: As a leading chemical company, we want to reduce total greenhouse gas emissions¹ from our production sites and our energy purchases by 25% by 2030 compared with 2018 – despite targeted growth and the construction of a large Verbund site in southern China.² By 2050, we aim to achieve net zero emissions from our production sites and our energy purchases.

Schematic overview: development of the BASF Group's greenhouse gas emissions (Scope 1 and 2)

Million metric tons of CO₂ equivalents



2030 target
-25% greenhouse gas emissions compared with 2018

Five levers to reduce greenhouse gas emissions:

- Gray-to-green
- Power-to-steam
- New technologies
- Bio-based feedstocks
- Continuous opex

Carbon management

We have bundled our global activities to reduce greenhouse gas emissions in our **carbon management** (see “Global targets and measures”). We only consider external offsetting measures as a temporary stop-gap if our activities do not make the desired contribution to reducing emissions. 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.

Our **new organizational structure** aims to drive forward our climate protection targets and carbon management activities with even greater focus and speed: The Corporate Strategy & Sustainability unit in the Corporate Center will continue to develop targets and track global target achievement, while the Net Zero Accelerator unit, which was launched at the beginning of 2022, will focus on accelerating the implementation of existing and new cross-company projects to reduce emissions. The emphasis is on low-carbon production technologies (see page 132), the circular economy (see page 44) and renewable energies (see page 128). Both units report directly to the Chairman of the Board of Executive Directors. This

ensures that climate protection-relevant aspects are integrated into strategic decision-making processes as well as into core business activities (see page 46). In parallel, our operating divisions are working on division-specific projects to reduce emissions, supported by the global service units.

We consistently align our actions with our climate protection targets, based on a comprehensive analysis of our emissions. Group-wide CO₂ emissions are anchored in the BASF Group's steering and compensation systems as a most important nonfinancial key performance indicator, giving them even more weight. Investments and acquisitions are assessed with regard to their impact on our climate protection targets.

We are gradually integrating our suppliers into the management of greenhouse gas emissions along the value chain. To this end, we launched our **Supplier CO₂ Management Program** in 2021 (see page 130).

¹ The goal includes greenhouse gases according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents (CO₂e).

² In March 2021, we replaced our previous target of CO₂-neutral growth until 2030 (baseline 2018: 21.9 million metric tons of CO₂e) with a new, more ambitious climate protection target to reduce absolute CO₂ emissions by 25% compared with 2018 (new target: 16.4 million metric tons of CO₂e).

We offer our customers solutions that help prevent greenhouse gas emissions and improve energy and resource efficiency. More than 60% of our annual research and development spending¹ goes toward developing these products, optimizing our processes, and toward research projects to make our processes more energy and resource-efficient and to prevent greenhouse gas emissions.

We continuously analyze potential risks to our business operations arising in connection with the topics of energy and climate protection and derive appropriate measures. We support the recommendations of the **Task Force on Climate-related Financial Disclosures** (TCFD). Since the 2019 reporting year, BASF's annual report has included an overview showing the sections and subsections in which TCFD-relevant information can be found (see page 19). We also participate in the program established by the international nonprofit organization **CDP** for reporting on data relevant to climate protection and have done so since 2004. BASF achieved a score of A- in CDP's 2021 climate change questionnaire, again attaining Leadership status. Companies on the Leadership level are distinguished by factors such as the completeness and transparency of their reporting. They also pursue comprehensive approaches in managing the opportunities and risks associated with climate change as well as strategies to achieve company-wide emission reduction goals.

We report on greenhouse gas emissions in accordance with the Greenhouse Gas Protocol as well as the sector-specific standard for the chemical industry.

Climate protection is a shared task. This is why we support various national and international initiatives and are involved in partnerships. For instance, in 2021 we worked with Together for Sustainability (TfS), the World Business Council for Sustainable Development (WBCSD) and the World Economic Forum's Low-Carbon Emitting Technologies Initiative (LCET) to harmonize the methodological approaches used to calculate Scope 3 emissions. This will help increase the transparency of greenhouse gas emissions along the

BASF Group's greenhouse gas emissions according to the Greenhouse Gas Protocol^a

Million metric tons CO₂ equivalents

BASF operations	2021	2020	2018 (baseline)
Scope 1 ^b			
CO ₂ (carbon dioxide)	17.234	16.860	17.025
N ₂ O (nitrous oxide)	0.418	0.609	0.677
CH ₄ (methane)	0.034	0.023 ^c	0.027
HFC (hydrofluorocarbons)	0.034	0.031 ^c	0.091
SF ₆ (sulfur hexafluoride)	0.001	0	0
Scope 2 ^c			
CO ₂	2.464	3.279	4.067
Total	20.185	20.802 ^d	21.887
Offsetting	0	0	0
Total after offsetting	20.185	20.802^d	21.887
Sale of energy to third parties (Scope 1) ^d			
CO ₂	0.947	0.845 ^e	0.773
Total	21.132	21.647^f	22.660
Use of biomass ^g			
CO ₂	0.091	0.024	n/a

^a BASF reports separately on direct and indirect emissions from the purchase of energy. Scope 1 emissions encompass both direct emissions from production and generation of steam and electricity, as well as direct emissions from the generation of steam and electricity for sale. Scope 2 emissions comprise indirect emissions from the purchase of energy for BASF's use.
^b Emissions of N₂O, CH₄ and HFC have been translated into CO₂ emissions using the Global Warming Potential, or GWP, factor. GWP factors are based on the Intergovernmental Panel on Climate Change (IPCC) 2007, errata table 2012 for the 2018 and 2020 reporting years, and IPCC 2014 for the 2021 reporting year. HFC (hydrofluorocarbons) are calculated using the GWP factors of the individual components.
^c Market-based approach. Under the location-based approach, Scope 2 emissions were 3.362 million metric tons of CO₂ in 2020 and 3.670 million metric tons of CO₂ in 2021.
^d Includes sales to BASF Group companies; as a result, emissions reported under Scope 2 can be considered twice in some cases.
^e Emissions are reported separately from Scope 1 and Scope 2 in accordance with the Greenhouse Gas Protocol.
^f The comparative figure for 2020 has been adjusted to reflect updated data.

supply chain and will provide the basis for a Scope 3 target-setting methodology for the chemical sector.

[For more information on climate protection, see basf.com/climate_protection](https://basf.com/climate_protection)

¹ Costs not relevant to the calculation of this share include research expenses in early innovation stages of the phase-gate process, patent costs and expenses for supporting services.

Global targets and measures

Compared with baseline 2018, we want reduce greenhouse gas emissions from our production sites (excluding emissions from the sale of energy to third parties) and our energy purchases by 25% by 2030, i.e., from 21.9 million metric tons to 16.4 million metric tons. This corresponds to a reduction of around 60% compared with 1990. Our long-term goal is net zero greenhouse gas emissions by 2050 (Scope 1 and 2).

2030 and 2050 targets

-25%

Reduction in our absolute greenhouse gas emissions by 2030 compared with 2018^a (Scope 1 and 2)

Net zero

Greenhouse gas emissions by 2050^a (Scope 1 and 2)

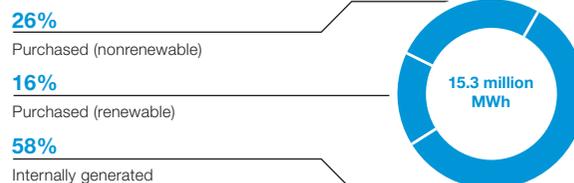
^a BASF operations excluding sale of energy to third parties, including offsetting

The BASF Group's emissions reported under these targets in 2021 amounted to 20.2 million metric tons of CO₂ equivalents (2020: 20.8 million metric tons of CO₂ equivalents). We were able to reduce emissions by around 3% year on year despite significantly higher production volumes due to the increased use of renewable energy and measures to improve energy efficiency and optimize processes. Lower ammonia production due to the high price of natural gas also reduced emissions.

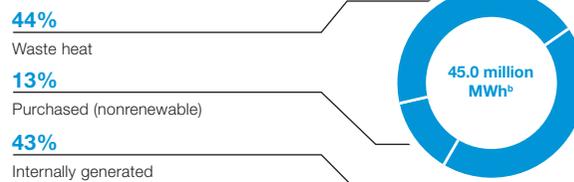
To achieve our ambitious climate protection goals, we have adopted comprehensive carbon management. This has **five levers to reduce greenhouse gas emissions**: Using renewable energies for both electricity and steam production (gray-to-green and power-to-steam levers), developing and applying new carbon-free and low-carbon production processes (new technologies lever, see page 132), using alternative raw materials (bio-based feedstocks

Energy supply of the BASF Group 2021

Electricity supply^a



Steam supply^a



^a Adjusted method for recognizing import/export of electricity and steam
^b Conversion factor: 0.75 MWh per metric ton of steam

lever), and ongoing measures to further increase energy and resource efficiency in our production (continuous opex lever).

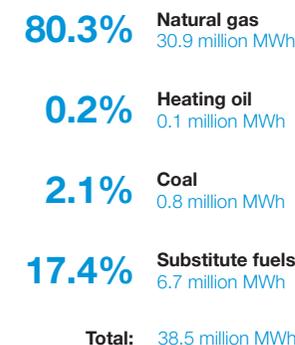
[For more information on climate protection, see page 27](#)

A projection of greenhouse gas emissions in 2022 can be found in the forecast from page 148 onward

Energy supply

Our total energy consumption, comprising fuel demand in our own central power and steam generation plants, primary energy requirements in our process plants, and net power and steam imports, was 58.8 million MWh in 2021.

Fossil fuels and residual fuels used in the BASF Group's central power and steam generation plants



To **generate our own steam and power**, we mainly use natural gas (80.3%) and substitute fuels (17.4%). These are residues from chemical production plants that cannot be reused in the BASF Verbund. We cover more than 58% of our electricity demand with our own gas and steam turbines in highly efficient combined heat and power plants. To achieve the highest possible energy yield with the lowest possible greenhouse gas emissions, we continuously invest in our combined heat and power plants. One example is our gas and steam turbine power plant at the Schwarzheide site in Germany, which is undergoing a €73 million modernization. Once it is started up in 2022, it will produce 10% more electricity and the CO₂ emissions factor of the power generated will be around 10% lower thanks to higher fuel efficiency.

Additional key indicators for energy and climate protection in BASF operations

	2021	2020	2018 (baseline)
Specific greenhouse gas emissions ^a (metric tons of CO ₂ equivalents per metric ton of sales product ^b)	0.564	0.639	0.577
Primary energy demand ^c (million MWh)	57.627	60.256	60.586
Energy efficiency (kilograms of sales product ^b per MWh)	621	540	626

^a Scope 1 and Scope 2 (market-based) according to the GHG Protocol, excluding emissions from the generation of steam and electricity for sale to third parties, including offsetting
^b Sales product volumes include sales between BASF Group companies; merchandise is not taken into account.
^c Primary energy used in BASF's plants as well as in the plants of our energy suppliers to cover energy demand for production processes Purchased renewable energy has a primary energy conversion efficiency rate of 100%.

Compared with separate methods of generating steam and electricity, we saved 15.0 million MWh of fossil fuels and avoided 3.0 million metric tons of carbon emissions in 2021. 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.

Another important component of carbon-optimized energy supply at our sites is the **Verbund system**. It helps us realize synergies and manage value chains in a resource-efficient way. For example, waste heat from one plant's production process is used as energy in other plants. The Verbund saved us around 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. That is why we will continue to invest in the creation and optimization of Verbund structures and drive forward the consolidation of production at highly efficient sites.

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 increasingly replace fossil fuels with energy from renewable sources. The electrification of our processes will significantly increase the BASF Group's green power demand over the coming years (see page 27).

To ensure access to energy from renewable sources, we are pursuing a **make and buy approach**. Firstly, BASF is investing in its own renewable power assets, particularly offshore wind farms. Secondly, BASF will purchase green power on the market through long-term supply agreements with plant operators, green power agreements or renewable energy certificates, depending on the region and market regulations. A key purchasing criterion is the "additionality" of the energy purchased. This means that power is primarily generated by new wind and solar farms.

In 2021, we entered into pioneering **cooperative agreements** to transform our energy supply. For instance, we currently hold a 49.5% share in Vattenfall's Hollandse Kust Zuid (HKZ) offshore wind farm. Pending approval of the relevant merger control authorities, we plan to sell shares in HKZ to Allianz Capital Partners in the first quarter of 2022. This will reduce our interest to 24.3%. The originally agreed power purchase volumes remain unaffected by the transaction on the basis of a long-term fixed-price power purchasing agreement. Once fully operational, expected in 2023, HKZ will have a total capacity of 1.5 gigawatts. We will use part of the electricity generated there at the Verbund site in Antwerp and at other European production sites. Under a letter of intent, together with RWE we are developing a project concept for an offshore wind farm in the German North Sea with a capacity of 2 gigawatts. Provided the regulatory framework is adapted by the authorities, this wind farm could supply the Verbund site in Ludwigshafen, Germany, with green electricity before 2030. Together with enviaM, we are also planning to build and operate a solar park with a total installed

capacity of 24 megawatts peak (MWp) to supply the Schwarzheide site in Germany.

In addition to these cooperative ventures, in 2021 we concluded further **long-term supply agreements** for green power. In Europe, these include a power purchase agreement for wind energy with the Engie group (volume: up to 20.7 TWh / term: 25 years) and an off-shore wind power purchase agreement with Ørsted (installed capacity: 186 MW / term: 25 years). We will procure energy for our new Verbund site in Zhanjiang, China, from a wind and solar park with a capacity of 400 megawatts. Further long-term supply agreements for wind and solar power were concluded in the United States for the Freeport and Pasadena sites (both in Texas).

In addition, we have converted existing agreements to green power and have acquired renewable energy certificates in a number of regions. The aim is to gradually replace these temporary measures with our own power assets or long-term supply agreements.

In total, over 88 sites worldwide (2020: 19) were already partially or fully powered by emission-free electricity at the end of 2021. The carbon footprint of purchased electricity in 2021 was around 0.21 metric tons of CO₂/MWh (market-based approach), significantly lower than in the previous year (0.41 metric tons CO₂/MWh).

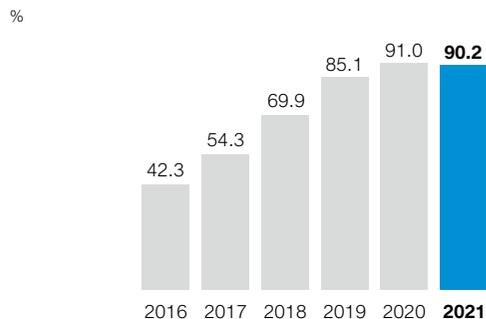
Specific greenhouse gas emissions and energy efficiency

Energy use and greenhouse gas emissions are closely linked to capacity utilization and production volumes at our plants. Specific greenhouse gas emissions in 2021 amounted to 0.564 metric tons of CO₂ equivalents per metric ton of sales product,¹ a decrease of 11.7% compared with the previous year (2020: 0.639 metric tons of CO₂ equivalents per metric ton of sales product). This was mainly due to higher demand compared with the previous year and consequently, better and more stable capacity utilization at our plants. In addition, the increased use of renewable energy had a positive impact on specific greenhouse gas emissions. Since 1990, we have been able to lower our overall greenhouse gas emissions from BASF operations by 49.7% and even reduce specific emissions by 75.4%.

As part of our carbon management, we aim to make our plants and processes even more efficient and resource saving. An important component of this is the introduction and ongoing maintenance of certified **energy management systems** according to DIN EN ISO 50001 at all relevant production sites.² These help us to identify and implement further potential for improvement in energy efficiency. This not only reduces greenhouse gas emissions and saves valuable energy resources but also increases our competitiveness. In 2021, 76 production sites worldwide had certified energy management systems, representing 90% of our primary energy demand.

A global working group provides ongoing support to the sites and Group companies in implementing and maintaining certified energy management systems. All energy efficiency measures are recorded in a global database, analyzed and made available to BASF sites as best practices.

Certified energy management systems (ISO 50001) at BASF Group sites worldwide, in terms of primary energy demand



We are currently pursuing more than 250 **technical and organizational measures** to reduce energy consumption and increase competitiveness. Our employees are an important source of optimization ideas in this regard. For instance, suggestions for improvement submitted by our employees in 2021 enabled us to avoid around 12,000 metric tons of CO₂ at the Ludwigshafen site in Germany alone.

We further improved energy and resource consumption in production with numerous projects around the world in 2021. At the Ludwigshafen site in Germany, for example, a multi-stage evaporation system set up at one plant saves over 60,000 metric tons of steam per year. At another plant, additional heat integration made it possible to supply other users with higher-pressure steam, reducing fuel consumption on the power plant side. At the Shanghai-Caojing site in China, a modernized control concept reduced the fuel demand of a heat recovery unit, and at another plant, steam demand was reduced by additional heat integration using a cooler. At the Geismar Verbund site in Louisiana, steam demand was reduced by the use of optimized condensate separators. In total, these measures save more than 23,000 metric tons of CO₂ annually. We also achieved additional savings in steam, electricity and fuel through process improvements at many other sites.

Carbon footprint, product carbon footprint and climate protection products

BASF has published a comprehensive corporate carbon footprint every year since 2008. This reports on all emissions along the value chain – from raw materials extraction to production and disposal.

The **Scope 3 greenhouse gas emissions** arising before and after BASF's activities in the value chain (in accordance with the Greenhouse Gas Protocol's definition) were determined as around 101 million metric tons of CO₂ equivalents for 2021 (2020: 92 million metric tons of CO₂ equivalents).³ We are continually working to reduce greenhouse gas emissions from our business activities – in our own production and, together with our partners, along the value chain.

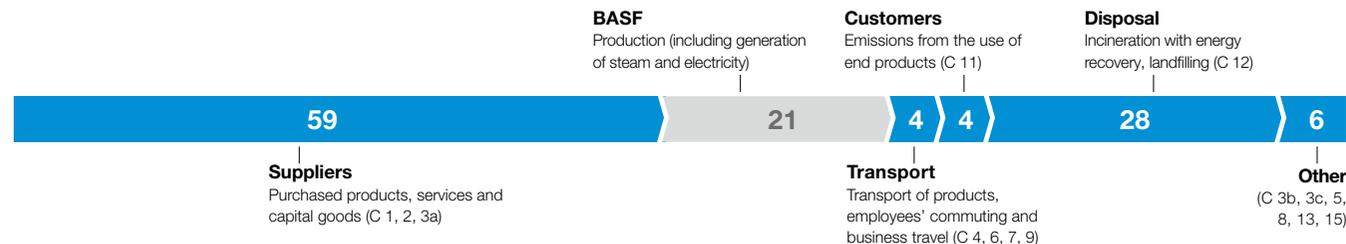
BASF was able to reduce emissions in the Scope 3 category "customers" by 2 million metric tons in 2021, primarily through the use of new blowing agents in polyurethane (PU) foams. Until now, the main blowing agents used were hydrofluorocarbons. These are used in the production of PU insulation materials to create foams with excellent insulation properties. The use of these hydrofluorocarbons in PU products will be prohibited in the European Union from 2023 due to their high climate impact. We are therefore gradually replacing them with hydrofluoroolefins, which have a much lower climate impact (measured by global warming potential, GWP). BASF began rolling out PU spray foams based on this new generation of blowing agents on the European market back in 2017. By the end of 2021, we will have almost completely converted our European PU spray foam production and will continue to systematically drive this forward in other regions as well.

Our climate protection products offer our customers solutions to avoid greenhouse gas emissions over their entire life cycle compared with reference products. The systematic analysis we conduct on our portfolio – Sustainable Solution Steering (see page 141) –

¹ Sales product volumes include sales between BASF Group companies; merchandise is not taken into account.
² Relevant sites are selected based on the amount of primary energy used and local energy prices.
³ Calculated in accordance with internationally recognized rules, including the use of values from general databases and industry averages.

Scope 3 emissions along the BASF value chain in 2021^a

Million metric tons CO₂ equivalents



^a According to Greenhouse Gas Protocol; Scope 1, 2 and 3; categories within Scope 3 are shown in parentheses. Scope 3 emissions in category 10 ("Processing of sold products") are not reported according to the standard for the chemical sector. Only direct use phase emissions are reported in the customer category (Scope 3.11). For more information on our Scope 3 emissions reporting, see basf.com/corporate_carbon_footprint

rates the use of these Accelerator solutions as particularly good with respect to climate protection and energy.

We calculate carbon footprints for around 45,000 sales products to increase **carbon transparency for our customers** (see box on the right). These Product Carbon Footprints (PCF) include all product-related greenhouse gas emissions generated until a BASF product leaves the factory gates ("cradle-to-gate").

The extraction of the raw materials we require and the production of purchased precursors account for the largest share of the PCF. We currently use industrial averages and values from commercial databases as the basis for calculating these upstream emissions.

In 2021, we introduced a global **Supplier CO₂ Management Program** to create transparency and better steer and, in the long term, 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 this way, 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.

[For more information on our emissions reporting, see basf.com/corporate_carbon_footprint](https://basf.com/corporate_carbon_footprint)

[For more information on Product Carbon Footprints, see basf.com/pcf](https://basf.com/pcf)

Good to know



Product Carbon Footprint

We use an in-house digital solution to calculate the carbon footprint of our products (PCF). In 2021, this was recognized by organizations such as the German chemical industry association (VCI) with the Responsible Care Award for digitalization. The methodology follows general standards for life cycle analysis such as ISO 14044 and ISO 14067, as well as the Greenhouse Gas Protocol Product Standard, and has been certified by TÜV Rheinland.

We used the new method to calculate PCFs for around 45,000 sales products in 2021. 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 were able to offer the first products with a certified reduced carbon footprint through the use of renewable energy.

We also started to make the automated PCF calculation approach available to interested industry players by way of partnerships. In a first step, IT companies will be able to translate BASF's methodology and in-house solution into a marketable software through licensing agreements.



Hydrogen is a key element on the journey to climate neutrality. BASF is developing a process – methane pyrolysis – that significantly reduces carbon emissions in the production of hydrogen. Find out more about what drives project manager Dieter Flick and which groundbreaking technologies are still being researched in the online report at report.basf.com.

In focus:

Innovative Processes for Climate-Smart Chemistry

Most of our production processes are already highly optimized. This makes it increasingly difficult to implement further improvements to reduce CO₂. Completely new technologies are needed to reduce greenhouse gas emissions over the long term and on a large scale. Different teams are working on this in our Carbon Management R&D Program.

Our focus here is on the production of basic chemicals such as hydrogen. The element is needed as a reaction partner in many processes. The processes currently used to produce hydrogen, such as steam reforming, produce high levels of CO₂ emissions. That is why BASF is open to different technologies and is driving forward two alternative processes for climate-smart hydrogen production: water electrolysis and methane pyrolysis. In **water electrolysis**, water is split directly into its two components, hydrogen and oxygen. If the required energy comes from renewable sources, the process is carbon-free. We intend to use the hydrogen generated by water electrolysis primarily as a material in the BASF Verbund and also, to a limited extent, for hydrogen model region projects in Germany's Rhine-Neckar region. We are currently working with Siemens Energy on initial concepts for the construction of a PEM (proton exchange membrane) water electrolyzer with a capacity of 50 megawatts at the Ludwigshafen site in Germany. We are also exploring various options for project funding.

In parallel, we are developing **methane pyrolysis** technology together with partners from academia and industry in a project sponsored by the German Federal Ministry of Education and Research. In this innovative process, (bio)methane is split directly into hydrogen and solid carbon. The process requires around 80% less electricity than water electrolysis and is virtually carbon-free if renewable energy is used. Following extensive groundwork, we started up a test plant for methane pyrolysis at the Ludwigshafen site in Germany in 2021.

It will provide insights into the heating concept, as well as the use of new types of materials.

Another focus area is **alternative heating concepts for our steam cracker furnaces** (see page 72). We use these plants to split petroleum into olefins and aromatics. This requires temperatures of around 850 degrees Celsius, which are normally achieved by burning fossil fuels – which emits high levels of CO₂. A fundamentally new heating concept based on electric resistance heating (eFurnace) and the use of renewable energy could eliminate up to 90% of process-related emissions in the future. To develop and pilot the concept, we signed a cooperation agreement with SABIC and Linde in 2021 and jointly applied for funding to build a demonstration plant.

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 can potentially 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.]

For more information on carbon management, see basf.com/carbon-management

Emissions to Air, Waste and Remediation

GRI 102, 103, 305, 306



We want to minimize the impact of our activities on people and the environment by continually reducing emissions to air, preventing waste and protecting the soil. Our plants are operated safely and efficiently. We use resources responsibly and are continually reducing the environmental impact of our plants and processes with our Operational Excellence Program.

At a glance

26,358 metric tons
Air pollutants from BASF operations

47.0%
Share of our waste recycled or thermally recovered

- Improvements based on continuous monitoring of emissions to air and waste streams
- Circular concepts an important part of our activities
- Systematic management of contaminated sites

Strategy

The safe and efficient operation of our plants and the responsible management of resources and waste are core components of our Responsible Care Management system. We have defined our global standards for emissions to air, waste and contaminated sites in Group-wide guidelines, the implementation of which is the responsibility of the sites and subsidiaries. The Environmental Protection, Health & Safety unit in the Corporate Center conducts regular audits to monitor compliance with legal requirements and internal

guidelines. BASF's global network of experts regularly shares information, insights and best practices to further reduce our emissions to air, manage waste and responsibly handle contaminated sites.

Continuous documentation and monitoring of emissions to air, waste streams and contaminated sites as well as the implementation of measures for improvement are an integral part of our environmental management. In addition to greenhouse gases (see page 126 onward), we also measure and analyze emissions of air pollutants to avoid potentially harmful substances as best possible.

Our **waste management** is based on the systematic tracking of material flows and follows a clear hierarchy: We aim to avoid waste as far as possible, for example, by continuously optimizing our processes or developing new production methods. BASF's Verbund structure with its networked plants and value chains is key here. We use it to efficiently manage our material flows. The by-products of one plant serve as feedstock for other plants and processes elsewhere in the BASF Verbund, avoiding waste and enabling us to use raw materials as efficiently as possible.

If these cannot be used within BASF's Verbund structures, we assess whether they can be recycled or thermally recovered. Non-recyclable materials are disposed of safely, appropriately and in an environmentally responsible manner. If we use external waste disposal companies, we conduct regular audits to ensure that waste is disposed of properly. In this way, we also contribute to preventive soil protection and keep today's waste from becoming tomorrow's contamination. If soil and groundwater contamination occurs at active or former sites, appropriate remediation measures are reviewed and implemented.

In addition to optimizing our own processes, we are committed to reducing the impact on air and soil and minimizing our disposal volumes and material consumption **along our value chains**. We expect our suppliers to comply with internationally recognized environmental standards. This is assessed as part of our sustainable

supply chain management. We support our suppliers in developing and implementing measures for improvement, for example in waste management (see page 111). We offer our customers a wide range of products that can reduce air pollutants or waste – from industrial process catalysts, fuel additives and catalysts for the automotive sector to additives and track-and-trace technologies to extend the useful life of plastics or improve mechanical recycling of plastic waste.

We are increasingly aligning our actions with the **circular economy principle**. For example, we are increasingly using recycled and waste-based raw materials in our production, recycling operating supplies, and expanding our capacities for recovering precious metals from spent automotive and industrial catalysts. We are also developing product-specific recycling technologies, often together with partners along our value chains. For instance, we are driving forward the chemical recycling of mixed plastic waste and disposed foam mattresses and are working on new concepts for recycling battery materials. We are also involved in cross-industry networks and initiatives to avoid waste and strengthen the circular economy. These include the Alliance to End Plastic Waste (see box on page 134) and the Ellen MacArthur Foundation.

 For more information on the circular economy, see page 44

Emissions to air

Total emissions of air pollutants from our production plants amounted to 26,358 metric tons in 2021 (2020: 24,496 metric tons^a). Emissions of ozone-depleting substances as defined by the Montreal Protocol totaled 17 metric tons in 2021 (2020: 14 metric tons). We significantly reduced these emissions compared with 2002 (229 metric tons) by successively shifting to alternative coolants. Emissions of heavy metals¹ in 2021 amounted to 2 metric tons (2020: 2 metric tons^a).

Emissions to air

Metric tons	2021	2020
Air pollutants from BASF operations		
CO (carbon monoxide)	3,951	3,731 ^a
NO _x (total nitrogen oxides)	11,450	10,646 ^a
NMVOC (nonmethane volatile organic compounds)	4,988	4,532 ^a
SO _x (total sulfur oxides)	1,864	1,861
Dust	2,154	2,000
NH ₃ (ammonia) and other inorganic substances	1,951	1,711
Total	26,358	24,496^a

^a The comparative figure for 2020 has been adjusted to reflect updated data.

We want to further reduce our emissions with various measures. For instance, we use catalysts to reduce nitrogen oxides or feed waste gases back into the production process. One example is the nitrous oxide generated in the production of adipic acid at the Ludwigshafen site in Germany: 99% of this by-product is already decomposed or used in the BASF Verbund. In the future, it will even be 99.9%. This will be made possible by an automation project implemented in 2021 to optimally control processes based on important plant parameters and using predictive model calculations. The aim is to avoid around 550 metric tons of nitrous oxide emissions annually, corresponding to around 145,000 metric tons of CO₂ equivalents.

Waste

BASF generated 2.47 million metric tons of waste in 2021 (2020: 2.21 million metric tons). Of this, 53.0% was disposed of. Hazardous waste accounted for 73.9% of the total disposed waste (2020: 69.6%). Based on the concept of the circular economy, we are continuously examining options for material or thermal recycling for all waste (see "Strategy"). In this way, we were able to find new uses for 47.0% of our waste in 2021. We continuously identify and evaluate the safest and most environmentally sound disposal routes for non-recyclable waste. In 2021, most of our hazardous waste was incinerated (77.7%), where possible with energy recovery. 7.6% of hazardous waste was disposed of in landfill. This is mainly contaminated construction waste that cannot be reused or recycled due to legal requirements.

Waste generation in the BASF Group

Million metric tons	Hazardous waste ^a		Nonhazardous waste ^a	
	2021	2020	2021	2020
Recycled	0.14	0.13	0.37	0.31
Thermally recovered	0.52	0.43	0.13	0.09
Waste recovered	0.66	0.56	0.50	0.40
Through incineration (without energy recovery)	0.75	0.64	0.10	0.10
In surface landfills	0.12	0.13	0.22	0.23
Other ^b	0.10	0.10	0.02	0.05
Waste disposed of	0.97	0.87	0.34	0.38
Total waste generation	1.63	1.43	0.84	0.78

^a Waste is classified as hazardous or nonhazardous waste according to local regulations.
^b Physical/chemical and biological treatment, underground disposal

Contaminated sites

We have global standards for managing contaminated sites. A worldwide network of experts ensures these are implemented. We develop remediation solutions that balance nature conservation, climate protection concerns, costs and social responsibility. This means making differentiated decisions on a case-by-case basis, founded on the legal framework and current technological standards. Contaminated sites are documented in a database. Ongoing remediation work around the world continued on schedule in 2021 and planning was concluded for future remediation projects.

For more information on provisions for environmental protection, see the Notes to the Consolidated Financial Statements on pages 224 and 260

Good to know

Alliance to End Plastic Waste

In 2019, we co-founded the Alliance to End Plastic Waste (AEPW) with other companies along the value chain – from plastics producers and consumer goods manufacturers to waste disposal companies. The AEPW now has around 65 members, who together aim to develop solutions that stop plastic waste from entering the environment, especially the ocean. There are four main focus areas: developing infrastructure for waste collection, promoting innovative recycling methods, education and engagement of various stakeholders, and cleanup of areas heavily impacted by plastic waste. The initiative aims to invest up to \$1.5 billion by 2023. For instance, BASF supports the AEPW's goal of establishing a circular economy for plastics with its ChemCycling™ project.

For more information on the Alliance to End Plastic Waste, see endplasticwaste.org

¹ Heavy metals are included in the figure for dust (see the table "Emissions to air").

Water

GRI 102, 103, 303



Water is of fundamental importance in chemical production. It is used as a coolant, solvent and cleaning agent, and to make our products. Our goods are transported via waterways. At the same time, water is a scarce commodity in more and more regions. That is why we promote the responsible use of this resource with sustainable water management.

At a glance

1,695 million
Cubic meters
total water abstraction

78.5%
of water demand covered
by reuse

- Responsible use a core part of our strategy
- Global water target 53.5% achieved
- Demand and utilization continuously optimized

Strategy

The responsible use of water as a resource is a core element of our Responsible Care Management System and an important part of our commitment to the United Nations' Sustainable Development Goals (SDGs). This is also reflected in our **position paper on water protection**, which we published in 2021.

Our global standards and requirements for water are defined in Group-wide guidelines. Among other things, these stipulate that water protection concepts must be implemented at all production sites. The guidelines also cover aspects such as process and transportation safety (see pages 120 and 125) in order to prevent production and transportation-related product spillages into water

bodies as far as possible. Our sites and subsidiaries are responsible for implementing and complying with internal guidelines and legal requirements. The Environmental Protection, Health & Safety unit in the Corporate Center conducts regular audits to monitor this. BASF's global network of experts shares information, insights and best practices around the responsible use of water on an ongoing basis.

Introducing and implementing **sustainable water management** has been a cornerstone of our strategy for many years now. Our focus here is on our Verbund sites and on production sites in water stress areas.¹ The aim is to protect water as a resource, to use it as efficiently as possible through recirculation, and to continuously reduce wastewater and emissions. We consider the quantitative, qualitative and social aspects of water use.

We pursue our goal by applying the European Water Stewardship standard, which rests on four principles: sustainable water abstraction, maintaining good water quality, preserving conservation areas, and ensuring continuous improvement processes.

We advocate the **responsible use of water as a resource** along the entire value chain. We audit supplier compliance with environmental standards in our regular supplier assessments (see page 110). Where improvement is necessary, we support suppliers in developing and implementing appropriate measures, such as the correct handling of wastewater. In addition, we are involved in a wide range of initiatives to promote sustainability in the supply chain (see page 113). For example, efficient water use is a core part of the Pragati project to improve sustainability in castor bean farming, the source of the castor oil we use.

We offer our customers solutions that help purify water and use it more efficiently while minimizing pollution. These include high-performance plastics to produce ultrafiltration membranes, seeds with higher drought and heat tolerance, or water-saving thin-film processes for metal pretreatment.

We work with numerous partners along the value chain and from civil society to protect water as a resource. For instance, BASF is a member of the Alliance for Water Stewardship, a global multi-stakeholder organization that promotes the responsible use of water. We are co-founders of the Alliance to End Plastic Waste (AEPW) and are also involved in other global networks such as the World Plastics Council or Operation Clean Sweep to effectively reduce and prevent plastic waste, especially in water bodies.

We report transparently and comprehensively on water. For instance, we again provided detailed answers to the 2021 water survey from the nonprofit organization **CDP**. BASF again achieved leadership status with an A- rating in the final assessment. CDP evaluates how transparently companies report on their water management activities and how they reduce risks such as water scarcity. The assessment also considers the extent to which product developments can also contribute to sustainable water management at the customers of the evaluated companies.

[For more information on our position paper on water protection, see basf.com/water](https://www.basf.com/water)
[For more information on the CDP water survey, see basf.com/en/cdp](https://www.basf.com/en/cdp)

¹ We define water stress areas as regions in which more than 40% of available water is used by industry, households and agriculture. Our definition is based on the Water Risk Atlas (Aqueduct 3.0) published by the World Resources Institute. For more information, see wri.org/aqueduct.

Global target and measures

Our goal is to introduce sustainable water management at our Verbund sites and at all production sites in water stress areas by 2030, covering 89% of BASF's total water abstraction. We achieved 53.5% of our target in 2021 (2020: 46.2%).¹ Sustainable water management was introduced at seven additional sites in 2021 (2020: 6).

As part of sustainable water management, our sites regularly assess the **water situation in the catchment area**. This raises awareness of potential risks and impacts for the population such as water scarcity. Based on the assessments conducted until the end of 2021, we did not identify any activities with a significant impact on water availability and quality at any site.

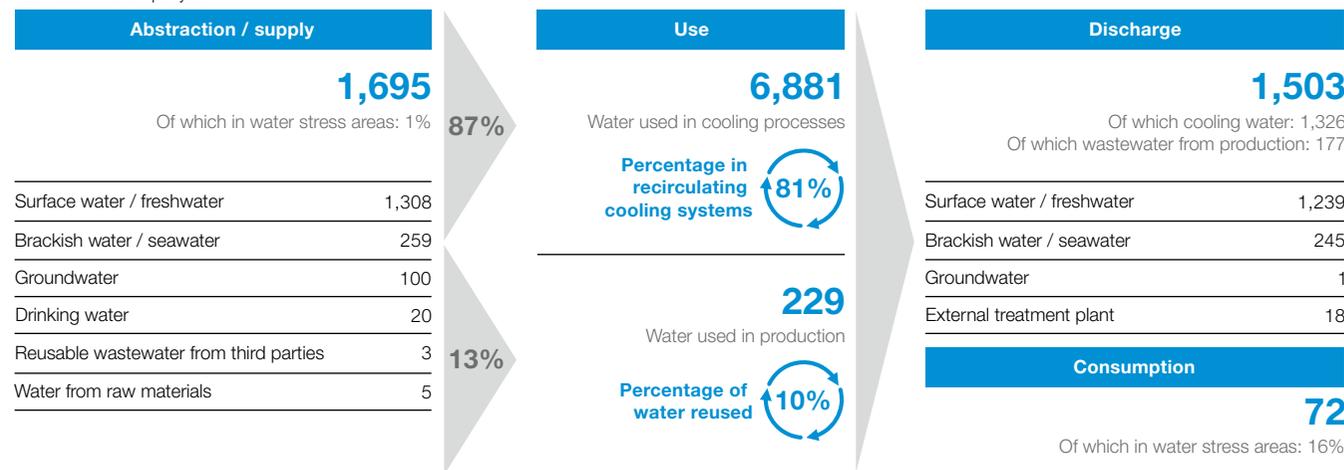
2030 target

Introduction of sustainable water management at our production sites in water stress areas and at our Verbund sites

Another important part of our sustainable water management is the continuous analysis and implementation of **measures for improvement**. For instance, we use wastewater from municipal wastewater treatment plants to reduce our demand for freshwater at our sites in Tarragona, Spain (since 2013) and Freeport, Texas (since 2019). At the Pontecchio site in Italy, we partially use rainwater, which reduced our demand for river and groundwater by 22,200 cubic meters in 2021. In Belgium, our Verbund site in Antwerp is a member of the Lerend Netwerk Water network of the Belgian chemical association Essenscia together with other chemical and pharmaceutical companies. The aim is to facilitate dialog on the responsible use of water and to develop action plans for water conservation and circular water use. At the Verbund site in Ludwigshafen, Germany, we have continually optimized cooling water needs over the past few years

Water in the BASF Group 2021

Million cubic meters per year



with various technical improvements. One example is the ethylene oxide plant, where a change in the pipeline route implemented in 2020 reduces the river water used for cooling purposes by around 4.7 million cubic meters compared with the reference period (June 2019 to June 2020). Since then, the cooling system has operated without pumps. This also saves around 360,000 kilowatt hours of electricity compared with the reference period.

Depending on the local situation, we also implement measures for improvement at our sites' catchment areas together with other stakeholders. One example is the Incentivo ao Produtor de Água program that we launched at the Guaratinguetá site in Brazil in 2011 together with local authorities, the Espaço ECO Foundation and other partners. Measures such as better soil management or the reforestation of riverbank woodlands have since significantly reduced surface runoff and soil erosion in the Ribeirão Guaratinguetá catchment area.

Water balance

Our **water abstraction** totaled 1,695 million cubic meters in 2021 (2020: 1,728). This demand was covered for the most part by freshwater such as rivers and lakes (84% of water abstraction). At some sites, we use alternative sources such as treated municipal wastewater, brackish water or seawater. A small part of the water we use reaches our sites as part of raw materials and steam, or is released in our production processes. We abstract most of the water we need for cooling and production ourselves. In 2021, 5% of our total water demand was covered by third parties (2020: 5%).

We predominantly use water for cooling purposes (87% of water abstraction), after which we discharge it back to our supply sources with no product contact. We reduce our demand for cooling water by recirculating as much of it as possible. To do this, we use recooling plants that allow water to be reused several times. Around 13% of our total water abstraction is used in production plants, for

¹ Our water target also continues to take into account the sites that we identified as water stress sites in accordance with Pfister et al. (2009) prior to 2019.

example, for extraction or dissolution processes or for cleaning. Here, too, we reduce our demand for water by recycling wastewater. Most of the water used for production purposes is discharged back to water bodies after being treated in our own or third-party plants. Overall, 78.5% of the water we use in cooling or production is reused several times.

The BASF Group's **water consumption** describes the amount of water that is not discharged to a water body, meaning that it is no longer available to other users. Consumption is mainly attributable to the evaporation of water in recirculating cooling systems. A smaller amount is from the water contained in our products. Water consumption in 2021 amounted to around 72 million cubic meters (2020: 63 million cubic meters).

In 2021, around 25% of our production sites were located in **water stress areas** (2020: 25%). These sites accounted for 1% of BASF's total water abstraction (2020: 1%).¹ In water stress areas, we mainly source water from third parties (81%) and largely cover our demand with freshwater. Water consumption in water stress areas accounted for 16% of BASF's total water consumption in 2021 (2020: 11%) and was primarily attributable to evaporation in cooling processes. Wastewater in water stress areas accounted for less than 1% of BASF's total wastewater. The share of wastewater from cooling processes in water stress areas is lower than for the BASF Group as a whole. Cooling water is rarely used for once-through cooling here. Instead, it is generally recirculated to reduce water demand. Production wastewater in water stress areas is primarily treated at third-party facilities.

The supply, treatment, transportation and recooling of water is associated with a considerable energy demand. We are constantly working to optimize our energy consumption and the amount of water we use, and to adapt to the needs of our business and the environment.

Emissions to water

A total of 1,503 million cubic meters of water were discharged from BASF production sites in 2021 (2020: 1,429), including 177 million cubic meters of wastewater from production.

Our wastewater is subject to strict controls and we carefully assess the impact of wastewater discharge in accordance with the applicable laws and regulations. Both internal audits and the responsible local authorities regularly assess whether the analyses and safety precautions at our sites comply with internal guidelines and legal requirements.

Emissions of nitrogen to water amounted to 3,000 metric tons in 2021 (2020: 2,900). Around 12,500 metric tons of organic substances were emitted in wastewater (2020: 11,500). Our wastewater contained 17 metric tons of heavy metals (2020: 22). Phosphorus emissions amounted to 340 metric tons (2020: 270).

Our approach is to reduce wastewater volumes and contaminant loads at the source in our production processes and to reuse wastewater and material flows internally as far as possible. To treat wastewater, we use both central measures in wastewater treatment plants and the selective pretreatment of individual wastewater streams before these are sent to the wastewater treatment plant. We use different methods depending on the type and degree of contamination – including biological processes, chemical oxidation, membrane technologies, precipitation or adsorption.

In order to avoid unanticipated emissions and the pollution of surface or groundwater, we have **water protection concepts** for our production sites in place. This is mandatory for all production plants as part of our Responsible Care Management System. The wastewater protection plans involve evaluating wastewater in terms of risk and drawing up suitable monitoring approaches. We use audits to check that these measures are being implemented and complied with.

 For more information, see basf.com/water

¹ Aqueduct 3.0 was used to identify sites in water stress areas to determine pro rata water abstraction and water consumption.

Biodiversity

GRI 102, 103, 304



Biodiversity describes the variety of life forms on Earth. Low flora and fauna diversity weakens ecosystems' ability to withstand changes such as climate change. As a chemical company, we depend on ecosystem services like the availability of renewable resources and high air, water and soil quality, while also influencing them. Protecting biodiversity is a key element of our commitment to sustainability.

At a glance

- Strategic alignment of our biodiversity measures based on impact assessments
- Commitment to preserving biodiversity along the entire value chain with strategic partnerships

Strategy

BASF sees the United Nations' Convention on Biological Diversity and the Sustainable Development Goals (SDGs) – including Life below water (SDG 14) and Life on land (SDG 15) – as important orientation and reference frameworks. Our measures help to preserve biodiversity and meet our responsibility to maintaining the wellbeing of the environment and society. Our corporate sustainability goals on climate protection, product portfolio, circular economy, water management and responsible procurement also help to protect biodiversity.

We align our biodiversity measures with the impact of our business activities along the value chain. Our focus here is on three impact areas: supply chains, sites and production, and product impact. We analyzed these in an internal workshop according to the five drivers of biodiversity loss as defined by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. These are

land-use change, climate change, invasive species, overexploitation and pollution. Our analysis showed that our impacts along the value chain mainly relate to the drivers of climate change, land-use change and pollution. We counteract the climate change driver of biodiversity loss – and in this way, help to preserve biodiversity – with our climate protection measures, which play an integral role in all our impact areas (see page 126).

We use various methods to **measure our sustainability performance** that implicitly and explicitly consider relevant risks and opportunities for biodiversity. These include the Eco-Efficiency Analysis, SEEBalance®, Sustainable Solution Steering, Value to Society, AgBalance® and the corresponding biodiversity calculator. Under Value to Society, we assess land use along value chains, among other things. Newly developed assessment methods help us to understand further influences on biodiversity. On the basis of this understanding, we seek dialog with partners and enter into strategic partnerships, through which we drive forward measures to protect biodiversity around the world.

Responsibility to our supply chains

Some of the business activities of our raw material suppliers involve land uses that can influence biodiversity (biodiversity loss driver: land-use change). We have laid down our expectations of our suppliers with regard to environmental, labor and social standards in the supply chain in the Supplier Code of Conduct (see page 109).

BASF procures a variety of renewable raw materials. In the procurement of **palm and palm kernel oil** in particular, there is an elevated risk that forest areas are cleared to create farmland. To improve sustainability in procurement, we established the BASF Palm Commitment in 2011, which was updated in 2015 and is implemented with our Palm Sourcing Policy. Third-party certification with standards such as the Roundtable on Sustainable Palm Oil (RSPO) standard enables us to take biodiversity criteria into account when purchasing raw materials (see page 113). We are also committed to the environmental sustainability of other supply chains through our

own initiatives, such as our **rambutan program**. This was launched in 2014 in close collaboration with partners in Vietnam to source botanical ingredients for cosmetic products from certified organic rambutan gardens. In cooperation with local farmers and NGOs, BASF's program promotes the preservation of biodiverse habitats, as well as good agricultural practices, gender equity and fair working conditions.

Our **position on forest protection** sets out our commitment to preserving biodiversity in areas of High Conservation Value such as High Carbon Stock forest areas and peatlands in the procurement of renewable raw materials. BASF participated in the "Forests" assessment conducted by the international organization **CDP** for the second time in 2021 and achieved a score of A–, again giving it Leadership status. CDP is a nonprofit organization that evaluates companies' management of the environmental risks and opportunities relating to forests, among other things. The assessment is conducted based on detailed insights into the palm value chain and activities that impact ecosystems and natural habitats.

Responsibility to our sites and production

Preservation of biodiversity is taken into consideration in the management of our sites. We operate our facilities in a responsible manner and minimize negative effects on the environment (biodiversity loss driver: pollution) by keeping air, water and soil emissions as low as possible and reducing and avoiding waste (see page 133 for more information).

Our site management measures consider our impact on the biodiversity loss driver of land-use change. For example, given the relevance of conservation areas to preserving diversity, we check how close our production sites are to internationally recognized conservation areas. In 2021, we included this indicator in our environmental database. This allows us to raise awareness of biodiversity at local level and draw attention to potential impacts of our sites on these areas. Four percent of our production sites are adjacent to a Ramsar site and 1% are adjacent to a category I, II or

Ill protected area as defined by the International Union for Conservation of Nature.¹ None of our production sites are adjacent to a UNESCO protected area.

We have adopted biodiversity as a criterion in decision-making processes. In addition, we systematically consider sustainability aspects when deciding whether to invest in the construction of new sites or expand existing ones. Aspects assessed include the potential impacts on forests and biodiversity.

We are implementing **local measures** to protect biodiversity at a number of sites. In Clermont, France, for example, grassed areas were converted into biodiversity-friendly spaces, nesting boxes for swallows and other bird species were installed, and their population sizes were measured and documented. In addition, training was held to raise employees' awareness of biodiversity.

We also take biodiversity conservation into account in our **production**. We are committed to complying with the provisions of international environmental agreements such as the Nagoya Protocol. The supplementary agreement to the U.N.'s Convention on Biological Diversity regulates access to genetic resources and access and benefit sharing. It sets out obligations (for example, compensation payments) for the users of genetic resources such as plant-based raw materials. We use internal control mechanisms to monitor compliance with standards.

Management of our product impact

BASF offers products and solutions for a wide range of industries. We want to ensure that our products meet our customers' standards in quality and, through appropriate use, pose no risk to humans, animals or the environment. Our commitment to the objectives set forth by the Responsible Care® charter of the International Council of Chemical Associations (ICCA) obligates us to continuously minimize the negative effects of our products on the environment, health and safety and

to optimize our products on an ongoing basis. It is important to consider the potential impacts of product use on biodiversity, for example, with regard to the biodiversity loss driver of pollution.

For example, we evaluate our products and solutions in **crop protection and seeds** throughout the entire research, development and registration process. After they have been approved for the market, we continue assessing them regularly for potential risks and impact to the ecosystems in which they are used. We have initiated various projects and offer training to prevent misuse of our products (see page 124).

All types of **land development**, such as agriculture and forestry, play a role in changing biodiversity (biodiversity loss driver: land-use change). Activities such as tillage, drainage, fertilization and the use of crop protection products can affect flora and fauna, for example, by influencing food sources. Minimizing these impacts while ensuring the necessary productivity is one of the biggest challenges farmers are facing. Our Agricultural Solutions segment focuses on four areas to help farmers to find the right balance: climate-smart farming, sustainable solutions, digital farming and smart stewardship (see page 90). In this context, we work with farmers to create balanced agricultural systems which enable productive and efficient farming of high-quality food products and at the same time promote biodiversity in the field. For example, we advise them on soil cultivation and look for suitable ways to improve biodiversity in farmlands. Our many years of experience in sustainability measurement and evaluation in agriculture are particularly useful here.

Our **AgBalance® method** and the biodiversity calculator, which has been available since 2020, enable a scientifically sound assessment of the impact of agricultural practices on biodiversity. Based on these assessments, we issue recommendations for measures such as planting flower strips or establishing nesting places to benefit pollinators like wild bees and farmland birds. Our modern seed solutions also enable better yield on existing farmlands and thus help protect natural habitats.

Good to know



Initiative to preserve the habitat of the monarch butterfly

The Alas para el Campo cooperation between the German Agency for International Cooperation (GIZ), BASF and partners from politics, academia, distributors and local communities was launched in Mexico in 2019. The aim is to restore the natural habitat of the monarch butterfly along its migration route. This also protects other pollinators. The focus of the initiative is on introducing sustainable farming measures, good agricultural practices and ecosystem conservation strategies, for the protection of pollinators and other beneficial insects. This enables farmers in Mexico, Central America and the Caribbean to restore natural habitats to promote biodiversity while laying the foundation for sustainable yields and prosperity in their communities.

BASF started the global registration for a new, more environmentally friendly insecticide active ingredient in 2021. The active ingredient, Axialion™, enables farmers to control a wide range of piercing and sucking pests that are harmful to crops. At the same time, it is highly compatible with beneficial insects such as pollinators. This supports

¹ We have defined "adjacent" as the area within a 3 km radius.

farmers in balancing agricultural productivity, environmental protection and societal demands.

Animal farming is essential to meeting growing global demand for products of animal origin such as meat, eggs and milk. Industrialized livestock production also requires large areas of agricultural land for growing feed, which has implications for the share of forest areas and biodiversity. BASF offers a range of feed additives such as enzymes, vitamins, glycinates and organic acids that improve nutrient utilization from feed. Better feed conversion and more sustainable livestock production mean that less land is needed, preserving natural ecosystems.

Strategic partnerships to promote biodiversity

Engaging in ongoing dialog with a variety of stakeholders is important to BASF. That is why we seek out partnerships with relevant interest groups and organizations worldwide to raise awareness of biodiversity and drive forward the action needed to preserve natural habitats. This enables us to firstly share the knowledge gained from our biodiversity activities and secondly learn from others to improve our own practices.

We cooperate with a number of organizations including the Roundtable on Sustainable Palm Oil, the Sustainable Palm Oil Forum, the Brazilian Coalition on Climate, Forests and Agriculture and the High Carbon Stock Approach Steering Group. The Taskforce on Nature-related Financial Disclosures (TNFD) is working to provide a framework for reporting on nature-related risks and related activities. In 2021, BASF joined the newly established TNFD Forum, a consultative network, to support this development. Our involvement in organizations such as the Alliance to End Plastic Waste and the Alliance for Water Stewardship (see page 135) help to preserve biodiversity in bodies of water.

Together with international partners and based on dialog with stakeholders in the food value chain, we are driving forward **measures to promote sustainable agriculture**. In the United States, for

example, BASF is a member of the Honey Bee Health Coalition, which aims to achieve healthy honey bee populations and support healthy populations of native and managed pollinators in productive agricultural systems and thriving ecosystems. BASF France is part of the Entreprises pour l'environnement (EpE) network, which launched the Act4nature campaign with the main objective of protecting and enhancing biodiversity.

Since 2013, we have also been working with different farmers and experts from the **BASF FarmNetwork Sustainability**, an association of farms in Europe, to integrate more connected biodiversity areas into agricultural production. Based on the insights gained from working together, an advisory board of experts from agriculture, nature conservation and environmental protection developed a biodiversity checklist and published it in 2021. This summarizes 10 ecologically effective and practicable measures to promote biodiversity. Since 2021, BASF has supported farmers participating in its #wirzahlenBiodiversität ("We pay biodiversity") program financially and with professional advice. Our initiatives to preserve biodiversity help farmers to achieve the right balance between economic and environmental factors and help them make an important societal contribution to the preservation of ecosystems.

 For more information on our responsible management of resources, see page 44

For more information on product stewardship, see pages 123 and 124

 For more information on our commitment to biodiversity, see [basf.com/biodiversity](https://www.basf.com/biodiversity)

For more information on our position on forest protection, see [basf.com/forestprotection](https://www.basf.com/forestprotection)

We Drive Sustainable Solutions

Innovations based on chemistry are key to solving global challenges such as climate change or resource scarcity. They can play a pivotal role in reducing emissions or decoupling growth and resource consumption, for example. Targeted research and development is the foundation for sustainable solutions and an important growth driver for BASF.

In this section:
Steering Our Product Portfolio
Circular Economy
Product Carbon Footprint

Steering Our Product Portfolio

GRI 102, 416, 417



We take advantage of business opportunities by offering our customers innovative products and solutions that support their sustainability goals. We ensure that the business units follow standard processes to evaluate and take into account relevant sustainability criteria when they develop and implement strategies, research projects and innovation processes.

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.

Based on our corporate strategy, we have set ourselves a global target: 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.

A significant steering tool for the product portfolio, based on the sustainability performance of our products, is the Sustainable Solution Steering method. It considers our products' applications in various markets and customer industries. Transparently classifying our products on the basis of their contribution to sustainability

Classification of assessed portfolio according to the Sustainable Solution Steering method

Accelerator

Substantial sustainability contribution in the value chain

Performer

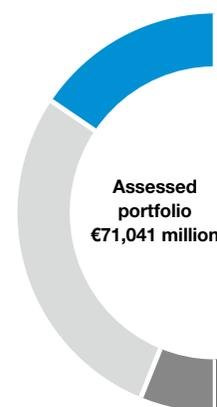
Meets basic sustainability standards on the market

Transitioner

Specific sustainability issues which are being actively addressed

Challenged

Significant sustainability concern identified and action plan in development or implementation



Accelerator sales

2021: €24,103 million
2020: €16,740 million

Performer sales

2021: €39,033 million
2020: €30,519 million

Transitioner sales

2021: €7,879 million
2020: €6,799 million

Challenged sales

2021: €26 million
2020: €72 million

enables us to systematically improve them. We review the categorization of the portfolio at least every four years. This includes analyzing the portfolio in workshops.

If, during reassessment of our portfolio, we identify products with significant sustainability concerns, we classify these as "challenged." We develop and systematically implement action plans for all products in this category. These include research projects and reformulations to optimize products, or even replacing the product with an alternative. To systematically align our portfolio with con-

tributions to sustainability, in 2018 we started phasing out all Challenged products within five years of their initial classification at the latest. We strive to offer products that make a greater contribution to sustainability in their area of application to live up to our own commitments and meet our customers' demands. That is why an adapted version of our Sustainable Solution Steering method is used in areas such as our research and development pipeline, and in merger and acquisition projects. The results and any measures required are part of our business strategies.

By the end of the 2021 business year, we had evaluated 98.7% of the relevant portfolio¹ (2020: 98.4%). This refers to the BASF Group's sales from products in its strategic portfolio to third parties in the business year concerned. By the end of 2021, sustainability analyses and assessments had been conducted for more than 56,000 specific product applications (2020: >57,000), accounting for €71 billion in sales (2020: €54.1 billion).

In 2021, we generated sales of €24.1 billion with Accelerator products (2020: €16.7 billion) – already reaching our target for 2025. Accelerator products account for 33.9% of the assessed relevant portfolio. Sales of Accelerator products rose by 44.3% compared with the previous year. This is primarily attributable to the positive development of Accelerator sales in the Surface Technologies and Chemicals segments. Performer products account for 54.9%, Transitioner products for 11.1% and Challenged products for 0.1% of the solutions assessed.

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 the comparative assessment, which is why we regularly reassess our product portfolio.

 For more information on Sustainable Solution Steering, see basf.com/en/sustainable-solution-steering

「Circular economy」

Circularity is a particular focus in the continued development of our product portfolio. This enables us to help our customers achieve their sustainability goals while improving the resource and carbon footprint of our products.

By 2030, we aim to generate sales of €17 billion with solutions for the circular economy. These include products based on renewable or recycled raw materials that close material cycles (“close the loop”) or increase the resource efficiency or life of materials (“extend the loop”).

In addition, we want to increasingly use alternative raw materials in the manufacturing of our products. These include bio-based raw materials such as bionaphtha and biogas, and renewable raw materials such as RSPO-certified palm oil, which we have been using for many years as a substitute for fossil resources. To expand our supply base for alternative raw materials and at the same time, contribute to the circular economy, we are also developing new, waste-based sources of raw materials. To achieve this, we develop innovative technologies, usually in cooperation with partners, for example for the chemical recycling of plastic waste or disposed mattresses made of polyurethane. We aim to process 250,000 metric tons of recycled and waste-based raw materials in our production plants annually from 2025.

One of the steps we have taken to achieve our goals is establishing a company-wide Circular Economy Program. As part of this program, BASF teams are currently developing new approaches to the three main action areas in more than 35 initiatives: alternative raw material pathways, innovative material cycles and new business models for the circular economy – which also include digital and service-based concepts.

 For more information on the circular economy, see page 44

For more information on raw materials, see page 112 onward

「Product Carbon Footprint」

In line with increasingly ambitious climate protection targets, CO₂ transparency is becoming more and more important for us and our customers. We have published a comprehensive corporate carbon footprint along our value chain every year since 2008. In addition, we already calculated carbon footprints for individual products in the past. To further increase transparency, we developed a digital solution to determine product-specific greenhouse gas emissions in 2020 and have since calculated the carbon footprints of around 45,000 sales products. These Product Carbon Footprints include all greenhouse gas emissions from raw material extraction to the finished BASF product leaving the factory gates (“cradle-to-gate”).

The data helps 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.

To determine the carbon footprint of our purchased raw materials (upstream Scope 3 emissions), we have until now worked with industry averages and values from external databases. To obtain a more accurate data base and reduce emissions in the supply chain, we launched our Supplier CO₂ Management Program in 2021. The aim of the program is to, in a first step, determine the carbon footprints of raw materials as accurately as possible. We support our suppliers here by sharing our knowledge of valuation and calculation methods, for example. In the second step, we then want to work with our suppliers to identify levers and targets to continuously reduce greenhouse gas emissions along the supply chain.

 For more information on our corporate carbon footprint and Supplier CO₂ Management Program, see page 130 onward

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



In focus: BASF Solutions for a Sustainable Future

Solutions based on chemistry are fundamental to a sustainable future. Every day, around 111,000 employees at BASF work to turn good ideas into innovative products that help solve global challenges such as climate change, resource scarcity or food supply.

Enabling climate-smart mobility

The transportation sector is one of the largest sources of greenhouse gases. In Europe, for example, around one-quarter of all CO₂ emissions are caused by road traffic. BASF helps to reduce exhaust emissions and vehicle fuel consumption with innovative solutions to treat exhaust gases such as zeolite SCR catalysts or tri-metal catalyst technology (see page 82), Keropur[®] fuel additives or lightweight high-performance plastics such as Ultramid[®], Ultradur[®] or Elastoflex[®].

At the same time, as a leading supplier of battery materials for lithium-ion batteries, we are paving the way for the age of electromobility. Here, too, the focus is on sustainability – from the responsible procurement of mineral raw materials and the most economical use in production to recycling at the end of the life cycle. In the future, the carbon footprint of our European production will be significantly below the industry standard thanks to our efficient manufacturing processes, the high share of renewable energy, and regional procurement and recycling of key raw materials.

In aviation, the Novaflex Sharkskin surface film developed jointly with Lufthansa Technik leads to noticeable CO₂ reductions. Its structure is modeled on sharkskin and optimizes aerodynamics at the flow-related parts of the aircraft. The sharkskin technology will be used on Lufthansa Cargo's entire freighter fleet from 2022. Through its use on the 10 Boeing 777F freighters alone, Lufthansa Technik

expects to save around 3,700 metric tons of kerosene and reduce CO₂ by around 11,700 metric tons every year.

Making better use of sun and wind

BASF products enable renewable energies to be used more efficiently. One example is solar salt. This mixture of sodium nitrate and potassium nitrate is used in concentrated solar power (CSP) plants (image left). As a heat transfer fluid at high temperatures of over 550 degrees Celsius, molten solar salt allows solar energy to be stored and thus used even in bad weather or at night.

Other examples are the amine-based hardeners Baxxodur[®] EC 301 and EC 201. Both have proven effective in processing epoxy resins for the manufacture of rotor blades for modern wind turbines. Baxxodur[®] hardeners contribute significantly to the advantageous properties of the cured epoxy resin, such as low weight, high mechanical strength, and high chemical and thermal resistance – all of which are key to the longevity of rotor blades.



Although one of BASF's oldest products, sodium nitrate is also used for innovative applications: Its excellent heat storage properties makes the technical salt ideal for solar thermal plants. BASF supplies it to one of the largest solar projects in the world – Noor Energy 1 in Dubai.

Avoiding CO₂ through efficient thermal insulation

An important lever in reducing CO₂ is the energy efficiency of buildings. For a number of years now, we have also offered biomass balance versions of our proven insulating materials Styropor®, Neopor®, Styrodur® and Elastopir®. Under a certified mass balance method, we replace 100% of the fossil raw materials used in the production of these product lines with renewable feedstocks. This significantly reduces the carbon footprint of the end product – in the case of Neopor® BMB, by 66% per cubic meter of insulation panel compared with conventional Neopor®.

Creating new products from waste

Our innovative technologies and solutions help to reduce waste generation and increase the amount of waste that can be recycled. One example is our portfolio of plastics additives. Among other things, these additives help to reduce waste by improving the durability of materials. Additives also enable improved mechanical recycling. For example, the IrgaCycle™ product series launched in 2021 helps our customers avoid certain quality problems in mechanically recycled plastics. This means that recycled plastics can also be used for higher-value applications and recycled content can be increased in the manufacture of new products.

In addition to our mechanical recycling solutions, we are driving forward chemical recycling (see page 115). In our ChemCycling™ project, our technology partners convert waste such as used tires or mixed plastic waste, which was not previously recycled, into pyrolysis oil. We can feed this pyrolysis oil into our Verbund structure in place of fossil raw materials and use it to make new products based on a certified mass balance approach. This reduces waste, saves resources and simultaneously reduces the carbon footprint of our products. One example is Styropor® Cycled™, which is used to manufacture products like insulated transport boxes for temperature-sensitive goods such as coronavirus vaccines. Another application is functional textiles. For example, VAUDE will be launching outdoor pants made using our Ultramid® Cycled™ polyamide from 2022.

Materials such as Infinergy® can be recycled. The expanded polyurethane is used in products such as shoe soles thanks to its outstanding spring and cushioning properties. Through a combination of mechanical processing and finishing, Infinergy can be recycled and regenerated with its original level of material quality.

We also have sustainable solutions for packaging and food containers made of cardboard, such as cups or boxes. Until now, these have typically been coated with a thin layer of polyethylene, which provides a protective barrier to liquids. However, this plastic layer makes recycling difficult. With its Joncryl HPB 4K range, BASF has developed a dispersion system that provides an excellent liquid barrier. Unlike conventional solutions, it is water-based. This makes it possible to efficiently recycle coated cardboard.

Natural ingredients for industrial and consumer goods

Both industrial users and end consumers are increasingly interested in nature-based ingredients. We are addressing this trend with a growing portfolio of plant-based solutions. One example is Disponil® APG 215 for the wood processing industry. Used as an adjuvant in production, this surfactant increases the bond strength of medium-density fiberboard (MDF). This enables manufacturers to achieve a denser and smoother surface and with it, improved water-repellent properties compared with conventional manufacturing processes. Disponil® APG 215 also offers energy saving potential in the production process and is 100% based on natural, renewable plant-based raw materials.

Alongside the natural trend, sensory characteristics such as consistency and texture play an important role in skin and hair care. That is why we are researching and developing alternatives to synthetic ingredients and excipients for cosmetics and personal care products. One example is Hydagen® Clean. Launched on the market in 2021, the biopolymer is characterized by its ease of use and high quality. It can be processed in both cold and hot water and is biodegradable. It is extracted from the tuber of the konjac plant native

to southwest China and is suitable for applications such as gels and fluids, as well as novel products such as patches and jelly cosmetics.

Reducing the environmental impacts of agriculture

The demand for food, feed and energy is increasing, while natural resources are limited. Agriculture is a key enabler in providing enough healthy, affordable food. Our innovative solutions help farmers find the right balance between productive and sustainable cultivation. One example is Revysol®. The new fungicidal active ingredient controls several economically important fungal diseases in several key crops globally. Its enhanced efficacy, improved selectivity and favorable regulatory profile allows farmers to maximize yield and to reduce the need to convert more natural habitat to farmland. Revysol®'s performance and its formulation innovation, which provides long-lasting protection under critical weather conditions, avoids the need for repeated fungicide applications. Revysol® helps to significantly reduce CO₂ emissions per ton of crop.

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. [...](#)